



SYNTHETIC ORGANIC CHEMICALS

United States Production
and Sales, 1988

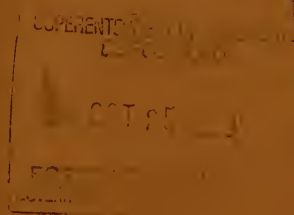
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United States International Trade Commission
Washington, DC 20436



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UNITED STATES INTERNATIONAL TRADE COMMISSION

SYNTHETIC ORGANIC CHEMICALS

United States Production and Sales, 1988

**U.S. Government Printing Office
Washington, 1989**

USITC Publication 2219

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CONTENTS

	<i>Page</i>
Introduction	1
Summary	3
General	5
Sections	
1. Coal tar, tar crudes and pitches	1-1
2. Primary products from petroleum and natural gas for chemical conversion	2-1
3. Cyclic intermediates	3-1
4. Dyes	4-1
5. Organic pigments	5-1
6. Medicinal chemicals	6-1
7. Flavor and perfume materials	7-1
8. Plastics and resin materials	8-1
9. Rubber-processing chemicals	9-1
10. Elastomers	10-1
11. Plasticizers	11-1
12. Surface-active agents	12-1
13. Pesticides and related products	13-1
14. Miscellaneous end-use chemicals and chemical production	14-1
15. Miscellaneous cyclic and acyclic chemicals	15-1
Appendixes	
A. Directory of manufacturers	A-1
B. Cyclic intermediates: Glossary of synonymous names	B-1
C. U.S. production and sales, 1985 harmonized system basic	C-1
D. Alphabetical chemical index	D-1

Introduction

This is the 72st annual report of the U.S. International Trade Commission on domestic production and sales of synthetic organic chemicals and the raw materials from which they are made. The report, along with the quarterly report titled *Preliminary Report on U.S. Production of Selected Synthetic Organic Chemicals (Including Synthetic Plastics and Resin Materials)*, is prepared under investigation No. 332-135, Synthetic Organic Chemicals Reports. This investigation is conducted under the authority of section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1322(g)), for the purpose of collecting data and preparing public reports on synthetic organic chemicals, plastics materials, medicinal chemicals, pesticides, and other organic chemical products. The annual report consists of 15 sections, each covering a specified group (based principally on use) of organic chemicals as follows: Coal tar, tar crudes and pitches; primary products from petroleum and natural gas for chemical conversion; cyclic intermediates; dyes; organic pigments; medicinal chemicals; flavor and perfume materials; plastics and resin materials; rubber-processing chemicals; elastomers; plasticizers; surface-active agents; pesticides and related products; miscellaneous end-use chemicals and chemical products; and miscellaneous cyclic and acyclic chemicals. Data have been supplied by approximately 718 producers.

Each of the 15 sections is headed by a summary of the statistical data. The first table in each section gives statistics on products and groups of products in as great detail as is possible without revealing the operations of individual producers. Statistics for an individual chemical or group of chemicals are given only when there are three or more producers, no one or two of which may be predominant. Moreover, even when there are three or more producers, statistics are not given if there is any possibility that their publication would violate the statutory provisions relating to unlawful disclosure of information accepted in confidence by the Commission.¹

Data are reported by producers for only those items where the volume of production or sales or value of sales exceeds certain minimums. Those minimums for all sections are 5,000 pounds of production or sales or \$5,000 of value of sales with the following exceptions: Plastics and resin materials—50,000 pounds or \$50,000; pigments, medicinal chemicals, flavor and perfume materials, and rubber-processing chemicals—1,000 pounds or \$1,000. They are usually given in terms of undiluted materials; however, products of 95 percent or greater purity are considered to be 100 percent pure. Commercial concentrations are applicable for dyes, certain plastics and resins, and a few solvents; such concentrations are specifically noted.

The statistics given in this report include data from all known domestic producers of the items covered and include the total output of each company's plants, i.e., the quantities produced for consumption within the producing plant, as well as the quantities produced for domestic and foreign sale. The quantities reported as produced, therefore, generally exceed the quantities reported as sold. Some of these differences, however, are attributable to changes in inventory.

The second table in each section lists all items for which data on production or sales have been reported, by primary manufacturers, identified by manufacturers' codes. Each code consists of not more than three capital letters and is assigned on a permanent basis.

The third table in each section is a directory, alphabetized by the codes of the manufacturers reporting in that section.

Appendix A is a directory, alphabetized by the names of the manufacturers reporting in all sections and which includes their general corporate phone numbers and office addresses.

Appendix B lists synonymous names for cyclic intermediates. Information on synonymous names of the organic chemicals included in this report may be found in the *SOCMA Handbook: Commercial Organic Chemical Names*, published by the Chemical Abstracts Service of the American Chemical Society, or the *Colour Index (Revised Third Edition)*, published jointly by the Society of Dyes and Colourists and the American Association of Textile Chemists and Colorists.

Appendix C presents the data in this report aggregated in the format of the Harmonized System (HS) nomenclature on a 6-digit HS basis.

Appendix D is an alphabetical index of all the products in this edition of the report.

Data contained in this report are compiled primarily from Commission's questionnaires sent to domestic producers and represent the best data available to the Commission. While the data supplied in the questionnaires are checked against data previously supplied by the submitting firm and with data supplied by other domestic producers, data are not independently verified by direct Commission examination of the books of companies furnishing information. Data contained in this report should not be used for investment and other purposes without independent verification.

As specified in the reporting instructions sent to manufacturers, production and sales (unless otherwise specified) are defined as follows:

PRODUCTION is the total quantity of a commodity made available by **Original Manufacturers Only** within the customs territory of the United States (includes the 50 states, the District of Columbia, and Puerto Rico). It covers synthetic organic chemicals, specified crudes from petroleum and coal tar, and certain chemically described natural products, such as, alkaloids, enzymes, and

¹ 18 U.S.C. u 1905 and 44 U.S.C. u 3508.

Introduction

perfume isolates. It is the sum—expressed in terms of 100% active ingredient unless otherwise specified in the reporting instructions—of the quantities:

Produced, separated, and consumed in the same plant or establishment. A Commodity is considered separated either when it is isolated from the reactive system or when it is not isolated, but weighed, analyzed, or otherwise measured. This includes by-products and co-products that are not classifiable as waste materials;

Produced and not isolated, but directly converted to a finished or semifinished item not included in this report (e.g., polyester film, polyurethane tires, nylon fiber, bar soap, etc.). (See specific instructions in individual sections);

Produced and transferred to other plants or establishments of the same firm or 100% owned subsidiaries or affiliates;

Produced and sold to, or bartered with, other firms (including less than 100% owned subsidiaries);

Produced *for others* under toll agreements (see general instructions);

Produced and held in stock.

PRODUCTION EXCLUDES:

Purification of a commodity, which is purchased by, or transferred from within, the company, unless inclusion of such processing is specifically requested in the reporting instructions for individual sections;

Intermediate products which are formed in the manufacturing process, but are not isolated from the reaction system—that

is, not weighed, analyzed, or otherwise measured; except such products as described above as being produced and not isolated, but directly converted to a finished or semifinished item.

Materials that are used in the process but which are recovered for re-use or sale;

Waste products having no economic significance.

SALES are actual quantities of commodities sold by **Original Manufacturers Only**. Sales include the quantity and value of:

Shipments of a commodity for domestic use or for export, or segregation in a warehouse when title has passed to the purchaser in a bona fide sale;

Shipments of a commodity produced for you *by others* under toll agreement;

Shipments to subsidiary or affiliated companies, provided the ownership is less than 100%.

SALES EXCLUDE:

All intra-company transfers within a corporate entity;

All shipments to 100% owned subsidiary or affiliated companies;

All resales of imported or purchased material, including materials obtained by barter;

All shipments of commodity produced *for others* under toll agreements.

VALUE OF SALES is the net dollar receipts of sales f.o.b. plant or warehouse, or delivered. F.o.b. values are preferred, but if they are not readily available from your records, delivered values are acceptable.

Summary

Combined production of all synthetic organic chemicals and primary products from petroleum and natural gas in 1988 was 387,659 million pounds—an increase of 2.4 percent from the output in 1987 (which also included data on tars) (table 1). Sales of these materials in 1988, which totaled 216,487 million pounds, valued at \$93,406 million, were 5.1 percent larger than in 1987 in terms of quantity and 26.2 percent more in terms of value. These figures include data on production and sales of chemicals measured at several successive steps in the manufacturing process, and, therefore, they necessarily reflect some duplication. During 1984–88, the total output of these products rose each year except for 1985 (figure 1). During that period the output of these products generally followed the trend of the Federal Reserve Board Index of U.S. Production.

In 1988, production of all synthetic organic chemicals, including cyclic intermediates and finished products totaled 273,248 million pounds, or 8.0 percent more than the output in 1987.

Eleven sections showed an increase in production in 1988 over 1987. Flavor and perfume materials (162 million pounds) increased by 28.5 percent; organic pigments (116 million pounds) increased by 23.4 percent; surface-active agents (7,316 million pounds) increased by 16.7 percent; plasticizers (2,300 million pounds) increased by 15.1 percent; miscellaneous end-use chemicals and chemical products (28,528 million pounds) increased by 13.1 percent; pesticides and related products (1,164 million pounds) increased by 12.0 percent; dyes (280 million pounds) increased by 9.9 percent, miscellaneous cyclic and acyclic chemicals (105,923 million pounds) increased by 8.1 percent; plastics and resin materials (63,536 million pounds) increased by 6.8 percent; cyclic intermediates (58,405 million pounds) increased by 5.8 percent; elastomer (synthetic rubber) (4,907 million pounds) increased by 4.6 percent; of the remaining sections, rubber processing chemicals (353 million pounds) showed a decreased of 7.7 percent; medicinal chemicals (258 million pounds) decreased 0.9 percent in 1988 from that in 1987.

Table 1
Synthetic organic chemicals and their raw materials U.S. production and sales, 1986 and 1987

Chemical	Production		Increase or decrease (-), 1988 over 1987 ¹	Quantity		Increase or decrease (-), 1988 over 1987 ¹	Value		Increase or decrease (-), 1988 over 1987 ¹
	1987	1988		1987	1988		1987	1988	
	Million pounds	Million pounds		Million pounds	Million pounds		Million dollars	Million dollars	
Grand total	378,465	387,659	2.4	206,048	216,487	5.1	74,012	93,406	26.2
Tar	2,291	1,970	-14.0	(²)	(²)	(²)	(²)	(²)	(²)
Primary products from petroleum and natural gas	123,119	112,441	-8.7	59,677	58,795	-1.5	7,620	10,517	38.0
Synthetic organic chemicals, total ³	253,055	273,248	8.0	146,371	157,692	7.7	66,392	82,889	24.9
Cyclic intermediates	55,196	58,405	5.8	23,206	26,491	14.2	7,562	9,369	23.9
Dyes	255	280	9.9	230	251	9.2	677	766	13.1
Organic pigments	94	116	23.4	83	87	4.3	586	595	1.4
Medicinal chemicals	261	258	-0.9	167	228	36.9	1,534	1,831	19.4
Flavor and perfume materials	126	162	28.5	81	95	16.6	726	866	19.3
Plastics and resin materials	59,481	63,536	6.8	51,170	55,240	8.0	26,066	33,831	29.8
Rubber-processing chemicals	382	353	-7.7	289	266	-8.0	359	424	18.1
Elastomer (synthetic rubber)	4,690	4,907	4.6	3,109	3,234	4.1	2,714	2,982	9.9
Plasticizers	1,998	2,300	15.1	1,876	1,874	-0.1	896	1,001	11.8
Surface-active agents	6,269	7,316	16.7	3,923	4,261	8.6	1,713	2,303	34.5
Pesticides and related products	1,040	1,164	12.0	911	935	2.7	4,171	4,354	4.4
Miscellaneous end-use chemicals and chemical products	25,223	28,528	13.1	21,010	22,518	7.2	7,355	9,449	28.5
Miscellaneous cyclic and acyclic chemicals	98,040	105,923	8.1	40,317	42,212	4.7	12,032	15,118	25.7

¹ Percentage calculated from figures rounded to thousands.

² Not available

³ Because of rounding, figures may not add to the totals shown.

Note.—Data for 1988 does not include ethane, propane, and butane production.

Source: Compiled from data received in response to questionnaire of the U.S. International Trade Commission.

General

Table 2—Continued
Synthetic organic chemicals summary of U.S. production and sales of intermediates and finished products, 1967, 1987, and 1988

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemicals	1967 ¹	1987	1988	Increase or decrease (-)	
				1988 over 1967	1988 over 1987
5. Flavors and Perfume Materials					
Cyclic:					
Production	57,978	70,740	78,378	35.2	10.8
Sales	47,285	56,239	57,060	20.7	1.5
Sales value	52,866	647,255	704,353	1232.3	8.8
Acyclic:					
Production	53,558	55,414	83,708	56.3	51.1
Sales	49,311	25,225	37,920	-23.1	50.3
Sales value	40,495	79,081	161,742	299.4	104.5
6. Plastics and Resin Materials					
Cyclic:					
Production	5,039,497	17,665,771	18,870,234	274.9	6.8
Sales	4,224,121	14,941,653	16,130,150	281.9	8.0
Sales value	1,036,940	10,582,852	13,735,504	1224.6	29.8
Acyclic:					
Production	8,759,452	41,814,939	44,665,906	409.9	6.8
Sales	7,753,242	36,228,390	39,110,090	404.4	8.0
Sales value	1,635,690	15,483,286	20,095,787	1128.6	29.8
7. Rubber-Processing Chemicals					
Cyclic:					
Production	220,139	354,372	318,482	44.7	-10.1
Sales	169,970	262,853	236,299	39.0	-10.1
Sales value	116,318	336,204	397,388	241.6	18.2
Acyclic:					
Production	43,994	27,642	34,248	-22.2	23.9
Sales	30,878	25,978	29,370	-4.9	13.1
Sales value	15,477	22,783	26,525	71.4	16.4
8. Elastomers (Synthetic Rubber)					
Production	3,822,545	4,690,358	4,906,572	28.4	4.6
Sales	3,262,044	3,108,761	3,234,468	-0.8	4.1
Sales value	874,237	2,714,048	2,982,130	241.1	9.9
9. Plasticizers					
Cyclic:					
Production	929,871	1,455,074	1,774,602	90.9	22.0
Sales	865,084	1,451,905	1,439,828	66.4	-0.8
Sales value	167,827	627,675	700,084	317.2	11.5
Acyclic:					
Production	332,908	543,421	525,814	58.0	-3.2
Sales	296,767	423,667	433,762	46.2	2.4
Sales value	93,142	267,991	301,219	223.4	12.4
10. Surface-Active Agents					
Cyclic: ²					
Production	1,418,444	2,646,680	3,032,382	113.8	14.6
Sales	852,238	1,991,374	2,282,000	167.8	14.6
Sales value	95,810	595,083	1,000,033	943.8	68.1
Acyclic:					
Production	2,060,851	3,621,853	4,283,694	107.9	18.3
Sales	897,786	1,931,643	1,979,221	120.5	2.5
Sales value	220,877	1,117,633	1,303,218	490.0	16.6
11. Pesticides and Related Products					
Cyclic:					
Production	823,158	647,516	759,704	-7.7	17.3
Sales	681,532	592,839	572,160	-16.0	-3.5
Sales value	627,742	2,828,226	3,054,331	386.6	-8.0
Acyclic:					
Production	226,505	392,021	404,129	78.4	3.1
Sales	215,831	317,756	363,014	68.2	14.3
Sales value	159,301	1,342,357	1,299,407	715.7	-3.2
12. Miscellaneous End-Use Chemicals and Chemical Product					
Cyclic:					
Production	(1,535,922)	3,510,100	3,389,523	(⁵)	-3.4
Sales	(775,540)	1,904,165	2,741,704	(⁵)	44.0
Sales value	(283,575)	3,952,458	1,984,420	(⁵)	-49.8

See footnotes at end of table.

Table 2—Continued
 Synthetic organic chemicals summary of U.S. production and sales of intermediates and finished products, 1967, 1987, and 1988

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemicals	1967 ¹	1987	1988	Increase or decrease (-)	
				1988 over 1967	1988 over 1987
12. Miscellaneous End-Use Chemicals and Chemical Product—Continued					
Acyclic:					
Production	(58,159,771)	21,713,001	25,138,350	(⁵)	15.8
Sales	(25,225,631)	19,106,276	19,776,367	(⁵)	3.5
Sales value	(3,192,119)	3,402,665	7,464,116	(⁵)	119.4
13. Miscellaneous Cyclic and Acyclic Chemicals					
Cyclic:					
Production	(⁵)	2,887,467	3,272,790	(⁵)	13.4
Sales	(⁵)	1,305,231	1,521,560	(⁵)	16.6
Sales value	(⁵)	1,397,386	1,747,959	(⁵)	25.1
Acyclic:					
Production	(⁵)	95,152,792	102,650,079	(⁵)	7.9
Sales	(⁵)	39,012,069	40,690,420	(⁵)	4.3
Sales value	(⁵)	10,634,765	13,369,576	(⁵)	25.7

¹ Standard reference base period for Federal Government general-purpose index numbers.

² Does not include data for elastomers.

³ Includes ligninsulfonates.

⁴ The data for 1967 are not comparable with current data as a result of a change in accounting procedures.

⁵ Items in these two sections were previously included in the section named miscellaneous chemicals.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

The following tabulation shows, by chemical groups, the number of companies that reported production in 1988 of one or more of the chemicals included in each group.

Chemical group	Number of companies	Chemical group	Number of companies
Cyclic intermediates	178	Elastomers (synthetic rubber)	31
Dyes	35	Plasticizers	45
Organic pigments	32	Surface-active agents	155
Medicinal chemicals	85	Pesticides and related products	70
Flavor and perfume materials	33	Miscellaneous end-use chemicals and chemicals products	164
Plastics and resins materials	259	Miscellaneous cyclic and acyclic chemicals	263
Rubber-processing chemicals	23		



Section 1

Coal Tar, Tar Crudes and Pitches

Coal tar is produced chiefly by the steel industry as a by-product of the manufacture of coke; water-gas tar and oil-gas tar are produced by the fuel-gas industry. Production of coal tar, therefore, depends on the demand for steel; production of water-gas tar and oil-gas tar reflects the consumption of manufactured gas for industrial and household use. Water-gas and oil-gas tars have properties intermediate between those of petroleum asphalts and coal tar. Petroleum asphalts are not usually considered to be raw materials for chemicals.

The U.S. International Trade Commission began collecting data on crude coal tar for the 1986 reporting year. In 1988, U.S. production of crude coal tar decreased to 162 million gallons from 189 million gallons in 1987. Production of crude light oil increased from 66 million gallons, in 1987 to 69 million gallons in 1988.

Tar crudes are obtained from coke-oven gas and by distilling coal tar, water-gas tar, and oil-gas tar. The most important tar crudes are benzene,

toluene, xylene, creosote oil, and pitch of tar. Some of these products are identical with those obtained from petroleum. Data for materials obtained from petroleum are included, for the most part, with the statistics for like materials obtained from coke-oven gas and tars, and are shown in table 3.

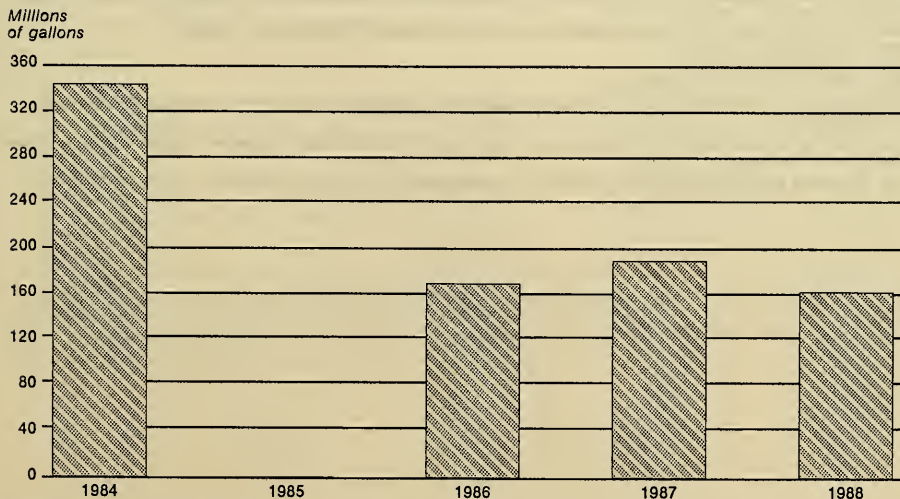
The domestic production by coke-oven operators of industrial and specification grades of benzene, toluene and xylene cannot be published since to do so would disclose the operations of individual companies. Some of the products obtained from tar and included in the statistics in table 3 are obtained from other products for which data are also included in the table. The statistics, therefore, involve considerable duplication, and for this reason no group totals or grand totals are given.

Table 4 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 5.

Data for 1988 tar crudes were supplied by 25 companies and company divisions.

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202-252-1348

Figure 2
Coal tar and tar crudes: U.S. production, 1984-88



Note.—Data for 1985 are not available.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 1

Table 3

Coal tar, tar crudes and pitches: U.S. production and sales, 1988

Coal tar, tar crudes and pitches	Unit of Quantity	Production	Sales		Average Unit value ¹
			Quantity	Value	
				1,000 dollars	
Crude coal tar:					
Coke-oven operators	1,000 gal	162,170	132,844	49,734	\$0.37
Crude light oil:					
Coke-oven operators	1,000 gal	68,801	68,673	33,766	.49
Light-oil distillates:					
Benzene, all grades, total ²	1,000 gal	(³)	(³)	(³)	(³)
Coke-oven operators	1,000 gal	(³)	(³)	(³)	(³)
Petroleum refiners ⁴	1,000 gal	1,588,333	1,091,164	1,133,458	1.04
Toluene, all grades, total ²	1,000 gal	(³)	(³)	(³)	(³)
Coke-oven operators	1,000 gal	(³)	(³)	(³)	(³)
Petroleum refiners ⁵	1,000 gal	873,685	513,213	444,179	.86
Xylene, all grades, total ²	1,000 gal	(³)	(³)	(³)	(³)
Coke-oven operators	1,000 gal	(³)	(³)	(³)	(³)
Petroleum refiners ⁶	1,000 gal	720,897	413,518	369,215	.89
Other tar distillates:					
Crude tar acid oils (having a tar acid content of 59% to less than 24%) ..	1,000 gal	3,143	2,648	3,106	1.17
Creosote oil (Dead oil) (100% creosote basis):					
Distillate as such (100% creosote basis)	1,000 gal	54,418	36,923	19,859	.54
Creosote in coal tar solution (100% solution basis)	1,000 gal	23,510	50,477	21,491	.43
Tar and tar pitches:					
Refined tar for uses other than road tar	1,000 gal	11,197	(³)	(³)	(³)
Pitch of tar:					
Hard	1,000 tons	591	(³)	(³)	(³)

¹ Unit value per gallon or ton as specified.² Includes data for material produced for use in blending motor fuels. The annual production statistics for petroleum refiners on benzene, toluene, and xylene are not comparable with the combined monthly production figures because of fiscal year revisions.³ Statistics cannot be published; to do so would disclose the operations of individual companies.⁴ Benzene, high purity (98-100%).⁵ Toluene, high purity (98-100%).⁶ Mixed xylenes, high purity (98-100%).

Note 1.—Statistics for materials produced in tar and petroleum refineries are compiled by the U.S. International Trade Commission.

Note 2.—Data for all other tars and tar crudes are not included in the 1988 report because publication would disclose the operations of individual companies.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 4

Coal tar, tar crudes and pitches for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Coal tar, tar crudes and pitches	Separate statistics ¹	Manufacturers' identification codes (according to list in table 5)
Light oil, light oil distillates, and tar bases:		
Crude light oil:		
Crude coal tar	Yes	ALS, ART, CGU, DTR, EKO, GSS, ILI, INL, KPT, LTV, NBC, SGO, TWD, WPS.
Crude light oil	Yes	ALS, ART, BTS, CGU, EKO, GSS, ILI, KPT, LTV, NBC, NTS, SGO, TWD, USX, WPS.
Light oil distillates:		
Benzene (Benzol):		
Tar (bases: crude bases (dry basis)	No	ABP, INL, KPT, NTS, USX.
Toluene (Toluol):		
Toluene (Toluol) other grades	No	ABP.
All other:		
All other light-oil distillates	No	LYP.
Other tar distillates:		
Naphthalene, crude:		
Methylnaphthalene	No	KPT.
Naphthalene, crude, solidifying at less than 74°C	No	BTS, COP, GSS.
Naphthalene, crude, solidifying at 76°C to less than 79°C	No	ACS, KPT.
Crude tar acid oils:		
Crude tar acid oils having a tar acid content of 5 percent to less than 24 percent	Yes	ACS, INL, KPT.
All other crude tar acid oils:	No	NTS.
Cresylic acid, crude:		
Sodium cresylate	No	KPT.
Creosote oil (Dead oil):		
Creosote oil (Dead oil): creosote content in solution (100 percent basis)	No	RIL.
Creosote oil (Dead oil): creosote in coal tar solution (100 percent solution basis)	Yes	ACS, ART, KPT, RIL.
Creosote oil (Dead oil): distillate as such (100 percent creosote basis)	Yes	ACS, ART, COP, KPT, RIL.
All other distillate products:		
Carbon black oil	No	ACS.
Crude coal tar solvent	No	KPT.
Priming and refractory oil	No	ART, BTS, KPT.
All other tar distillates	No	GIV.
Tar and tar pitches:		
Tar, road:		
Tar, road	No	ACS, RIL.
Tar for other uses:		
Tar for other uses: crude	No	ALS, BTS, IGC.
Tar for other uses: refined	Yes	ACS, COP, KPT, RIL.
Pitch of tar:		
Pitch of tar: hard (M.P. 161° F and over)	Yes	ACS, ART, KPT, RIL.
Pitch of tar: medium (M.P. 110° To 160° F)	No	ART, COP, KPT, RIL.
Pitch of tar: soft (M.P. 80° To 109° F)	No	ART, COP.
All other:		
All other pitch of tar	No	WPS.

¹ Chemicals for which separate statistics are reported in this section are indicated by "Yes." Chemicals for which data are accepted in confidence and may not be published are indicated by "No."

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

See footnotes at end of table.

Table 5

Coal tar, tar crudes and pitches: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABP	Drummond Co. Inc.	GSS	Gulf States Steel
ACS	Allied Signal, Inc., Engineered Materials Sector	IGC	Indiana Gas & Chemical Corp.
ALS	Armco, Inc. Eastern Steel Div.	ILI	Acme Steel Corp.
ART	Aristech Chemical Corp.: Chemical Div. Gary Works	INL	Inland Steel Co.
BTS	Bethlehem Steel Corp.	KPT	Beazer Material & Service, Inc.
CGU	Citizen Gas And Coke Utility	LTV	LTV Steel Co.
COP	Coopers Creek Chemical Corp.	LYP	Lyondell Petrochemical Co.
DTR	Detroit Coke Corp.	NBC	New Boston Coke Corp.
EKO	Empire Coke Co.	NTS	National Steel Corp., Great Lakes Plant
GIV	Givaudan Corp.	RIL	Relly Industries, Inc.
		SGO	Shenango, Inc.
		TWD	Tonawanda Coke Corp.
		USX	USS, DIV., Of USX
		WPS	Wheeling-Pittsburg Steel Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 2

Primary Products from Petroleum and Natural Gas for Chemical Conversion

Primary products that are derived from petroleum and natural gas are related to the intermediates and finished products made from such primary materials in much the same way that crude products derived from the distillation of coal tar¹ are related to their intermediates and finished products. Many of the primary products derived from petroleum are identical with those derived from coal tar (e.g., benzene, toluene, and mixed xylenes). Considerable duplication exists in the statistics on the production and sales of primary petroleum products because some of these primary chemicals are converted to other primary products derived from petroleum and because data on some production and sales are reported at successive stages in the conversion process. The statistics are sufficiently accurate, however, to indicate trends in the industry. Many of the primary products for which data are included in the statistics may be used either as fuel or as basic materials from which other chemicals are derived. In this report every effort has been made to exclude data on materials that are used as fuel; however, data are included on toluene and mixed xylenes, which are used in blending aviation and motor fuel.

The total production of primary products derived from petroleum and natural gas during

1984-88 is shown in figure 3. Beginning in 1988, production and sales data no longer are collected for ethane, propane, and butane. Total production for primary products during 1988 amounted to 112,441 million pounds, a 9 percent increase over 1987 production without ethane, propane, and butane data.

The output of aromatic and naphthenic products from petroleum amounted to 29,220 million pounds in 1988, compared with 26,762 million pounds in 1987. Sales amounted to \$2,254 million in 1988 and \$1,946 million in 1987. In 1988, production of high purity benzene was 11,627 million pounds; production of high purity toluene was 6,299 million pounds; and production of high purity mixed xylenes was 5,479 million pounds (table 6).

Production of all aliphatic hydrocarbons and derivatives from petroleum and natural gas was 83,220 million pounds in 1988. Sales of these products were valued at \$8,262 million. Production of ethylene was 37,204 million pounds in 1988. The output of 1,3-butadiene was 3,169 million pounds and propylene production was 21,224 million pounds during 1988 (table 6).

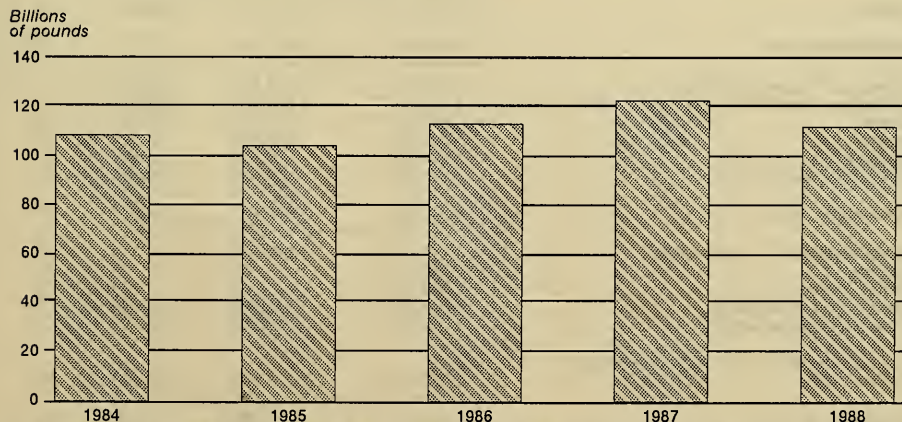
Table 7 lists the products reported in this section and indicates the manufacturer of each by code. The codes are identified by company name in table 8.

Data for 1988 primary products from petroleum and natural gas for chemical conversion were supplied by 67 companies or company divisions.

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¹ Statistics on chemicals from coal tar are given in Section 1 (Tar and Tar Crudes) of this report.

Figure 3
Primary products from petroleum and natural gas for chemical conversion: U.S. production 1984-88



Note.—Data for 1988 does not include ethane, propane, and butane production.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 2

Table 6

Primary products from petroleum and natural gas for chemical conversion:
U.S. production and sales, 1988

Primary products from petroleum and natural gas for chemical conversion	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	112,440,599	58,795,094	10,516,812	\$.18
Aromatics and naphthenes²				
Total	29,220,164	18,205,338	2,254,113	.12
Benzene, all grades, total	(³)	(³)	(³)	(³)
High purity (98-100%)	11,626,594	7,987,323	1,133,458	.14
Other (90-97.9%)	(³)	(³)	(³)	(³)
Toluene, all grades, total	(³)	(³)	(³)	(³)
High purity (98-100%)	6,299,270	3,707,473	444,179	.12
Other (90-97.9%) ⁴	(³)	(³)	(³)	(³)
Xylenes, mixed, total	(³)	(³)	(³)	(³)
High purity (98-100%)	5,478,817	3,142,740	369,215	.12
Other (90-97.9%)	(³)	(³)	(³)	(³)
All other aromatics and naphthenes ⁶	5,815,483	3,367,802	307,261	.09
Aliphatic hydrocarbons				
Total	83,220,435	40,589,756	8,262,499	.20
C ₂ Hydrocarbons, total ⁷	37,203,908	14,553,625	3,695,038	.25
Acetylene ⁸ (For chemical use only)	(³)	(³)	(³)	(³)
Ethylene	37,203,908	14,553,625	3,695,038	.25
C ₃ Hydrocarbons, total ⁹	21,223,882	13,356,176	2,196,937	.16
Propylene ¹⁰	21,223,882	13,356,176	2,196,937	.16
C ₄ Hydrocarbons, total ¹¹	12,574,552	6,368,316	1,073,176	.17
Butadiene and butylene fractions	1,869,981	1,123,645	127,568	.11
1,3-Butadiene, grade for rubber (elastomers) ..	3,168,823	2,914,724	632,780	.22
1-Butene	638,464	349,236	80,213	.23
Isobutane	969,092	490,669	41,415	.08
Isobutylene	1,243,805	396,652	67,327	.17
All other C ₄ hydrocarbons ¹²	4,684,387	1,093,390	123,873	.11
C ₅ Hydrocarbons, total	3,332,654	1,091,027	132,577	.12
Isoprene (2-Methyl-1,3-butadiene)	367,706	244,163	44,115	.18
n-Pentane	255,039	(³)	(³)	(³)
Pentenes, mixed	288,160	(³)	(³)	(³)
Piperylene (1,3-Pentadiene)	122,989	116,702	16,986	.15
All other C ₅ hydrocarbons ¹³ ¹⁴	2,298,760	730,162	71,476	.10
All other aliphatic hydrocarbons, derivatives and mixtures, total	8,885,439	5,220,612	1,164,771	.22
Alpha olefins, C ₆ -C ₁₀	871,310	(³)	(³)	(³)
Alpha olefins, C ₁₁ and higher	694,074	385,877	165,518	.43

See footnotes at end of table.

Table 6—Continued

Primary products from petroleum and natural gas for chemical conversion:
U.S. production and sales, 1988

Primary products from petroleum and natural gas for chemical conversion	Production	Sales		Average Unit value ¹
		Quantity	Value	
		1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Allphatic hydrocarbons—Continued				
All other allphatic hydrocarbons, derivatives and mixtures—Continued				
Dodecene (Tetrapropylene)	336,849	294,157	59,039	.20
n-Heptane	158,806	155,693	23,581	.15
Hexane	678,535	758,286	76,227	.10
Nonene (Tripropylene)	576,229	302,611	66,017	.22
n-Paraffins ¹⁵	2,289,879	1,699,444	226,404	.13
All other ¹⁶	3,279,757	1,624,544	547,985	.34

¹ Calculated from rounded figures.

² The chemical raw materials designated as aromatics are in some cases identical with those obtained from the distillation of coal tar; however, the statistics given in the table above relate only to such materials as are derived from petroleum and natural gas. Statistics on production and/or sales of benzene, toluene, and xylene from all sources are given in table 1 of the report on "Tar and Tar Crudes."

³ Reported data are accepted in confidence and may not be published, or no data were reported.

⁴ Includes toluene, solvent grade, 90 percent.

⁵ Includes toluene and xylene used as solvents; may include that which is blended in aviation and motor gasolines.

⁶ Includes data for alkyl aromatics, crude cresylic acid, cyclopentane, naphthalene, naphthenic acid, carbon black feedstock, distillates, solvents and miscellaneous cyclic hydrocarbons. Also includes production and/or sales data for the other than high purity grades of benzene, toluene, and mixed xylenes.

⁷ Ethane production and sales data are no longer collected.

⁸ Production figures on acetylene from calcium carbide for chemical synthesis are collected by the U.S. Bureau of the Census.

⁹ Propane production and sales data are no longer collected.

¹⁰ Includes data for refinery propylene.

¹¹ Butane production and sales data are no longer collected.

¹² Includes production and/or sales data for 2-butene, mixtures of 1-butene and 2-butene, and mixed C₄ streams.

¹³ Includes data for mixtures of C₆ hydrocarbons, isopentane, and 2-pentene.

¹⁴ Includes sales data only for n-pentane and mixed pentenes.

¹⁵ Includes data for the following chain lengths: C₈-C₉, C₉-C₁₅, C₁₀-C₁₄, C₁₀-C₁₈, C₁₂-C₁₆ and others.

¹⁶ Includes production and/or sales data for acetylene, alpha olefins (C₈-C₁₀), methane, isohexanes, isohexane, iso-octane, neohexane, mixed hexenes, mixed heptenes, mixed octenes, n-octane, di-isobutylene, eicosane, mixtures of C₂ and C₃, C₅-C₆, C₆-C₇, C₆-C₇ hydrocarbons, hydrocarbon derivatives, and other hydrocarbons.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 2

Table 7

Primary products from petroleum and natural gas for chemical conversion and/or sales were reported, identified by manufacturer, 1988

Primary products from petroleum and natural gas for chemical conversion	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 8)
Aromatics and naphthenes:		
Alkyl aromatics:		
Cyclosols	No	CXI.
All other alkyl aromatics	No	SHC.
Benzene total:		
Benzene high purity (98-100%)	Yes	AMO, ASH, CCP, CNE, CSD, CSP, DOW, ENJ, GRS, HES, LYP, MOC, PLC, PPR, SHC, SIO, SM, SOC, SOG, SUN, SWR, TOC, TX, UOC, USI.
Benzene other	No	AMO, KHI, KLM, VST.
Cresylic acid (less than 75 percent distilling over 215° C)	No	KHI, PSG.
Cyclopentane	No	PLC.
Naphthalene	No	CXI, TX.
Naphthenic acid:		
Naphthenic acid, acid number 150-199	No	CPS, HEC, MER.
Naphthenic acid, acid number 200-224	No	MER, PSG.
Naphthenic acid, acid number 225-249	No	PSG.
Naphthenic acid, acid number less than 150	No	HEC, SHC.
Toluene total:		
Toluene high purity (98-100%)	Yes	ASH, CNE, CSD, DOW, ENJ, GRS, HCL, HES, KHI, LYP, MOC, PLC, PPR, PPX, SC, SHC, SIO, SM, SOG, SUN, SWR, TOC, TX, UOC.
Toluene other	No	SHC, SOC.
Xylenes, mixed, total:		
Xylene high purity (98-100%)	Yes	AMO, ASH, CSD, ENJ, GRS, HES, LYP, PLC, PPR, SHC, SOG, SUN, SWR, UOC.
Xylene other	No	AMO, MOC, TOC.
All other aromatics and naphthenes:		
Aromatics, C ₈	No	MOC.
Benzene, toluene, xylene, mixtures	No	ELP.
All other products from petroleum and natural gas, cyclic	Yes	AMO, ASH, BAS, BFG, EKX, ELP, ENJ, LYP, OMC, PLC, SHC, TX, UCC, UPM, VST.
Aliphatic hydrocarbons:		
C ₁ Hydrocarbons:		
Methane	No	SHO.
C ₂ Hydrocarbons:		
Acetylene (for chemical use only)	No	RH, UCC.
Ethylene	Yes	AMO, BAS, BFG, CNE, DOW, DUP, EKX, ELP, ENJ, HKO, KHI, LYP, MCB, OMC, PLC, SHC, SM, SOC, SUN, TX, UCC, USI, UTP, VST.
C ₃ Hydrocarbons:		
Hydrocarbons, C ₂ -C ₃ , mixtures	No	CGO, TU, UCC.
Propylene	Yes	AMO, ASH, BAS, BFG, CCP, CGO, CLK, CNE, CSD, DA, DOW, DUP, EKX, ELP, ENJ, GRS, HKO, KHI, LYP, MCB, MOC, PLC, PPS, SHC, SIO, SM, SOC, SOG, SUN, TCR, TX, UCC, USI, UTP, VLR, VST.
C ₄ Hydrocarbons:		
Butadiene and butylene fractions	Yes	BAS, DA, DOW, EKX, ELP, HKO, PLC, SOC, TX, UCC, USI, VST.
1,3-Butadiene, grade for rubber (Elastomers)	Yes	AMO, CNE, DOW, ENJ, LYP, SHC, SM, TPC, TX.
1-Butene	Yes	ENJ, SHC, SM, SOC, TNA, TPC.
2-Butene	No	TPC.
1-Butene and 2-butene, mixed	No	LYP, SHC, TNA.
Hydrocarbons, C ₄ fraction	No	KHI, TX.

See footnotes at end of table.

Table 7—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Primary products from petroleum and natural gas for chemical conversion	Separate statistics ¹	Manufacturers' identification codes (according to list in table 8)
Alliphatic hydrocarbons—Continued		
C₄ Hydrocarbons—Continued		
Hydrocarbons, C ₄ mixtures	No	LYP, MCB, PPR, SOG.
Isobutane (2-Methylpropane)	Yes	AMO, CSP, DA, ENJ, KHI, PLC, SHO, SM, SUN, TX.
Isobutyliene (2-Methylpropene)	Yes	AMO, ATR, ENJ, SHC, TPC, TX.
All other C ₄ hydrocarbons	No	ENJ, SM, TX.
C₅ Hydrocarbons:		
Hydrocarbons, C ₅ mixtures	No	GYR, HKO, LYP.
Isopentane (2-Methylbutane)	No	PLC, SHO.
Isoprene (2-Methyl-1,3-butadiene)	Yes	DOW, ENJ, GYR, LYP, SOC.
n-Pentane	Yes	ASH, KHI, PLC, SHO.
2-Pentene	No	BFG, DOW.
Pentenes, mixed	Yes	CSP, CXI, PLC, SHO, TX.
Piperylene (1,3-Pentadiene)	Yes	CXI, DOW, LYP.
All other C ₅ hydrocarbons	No	DA, ENJ, SHC, TX.
All other alliphatic hydrocarbons, derivatives, and mixtures, total:		
C₆ Hydrocarbons:		
Hexane	Yes	ASH, ENJ, HMY, PLC, SHO, SOG, TX, UOC.
1-Hexene	No	PLC.
Hexenes, mixed	No	ENJ.
Hydrocarbons, C ₆ -C ₆ mixtures	No	PLC.
Hydrocarbons, C ₆ -C ₇ mixtures	No	ENJ.
Isohexane	No	PLC.
Neohexane (2,2-Dimethylbutane)	No	PLC.
All other C ₆ hydrocarbons	No	PLC, SHC, SM, TX.
C₇ Hydrocarbons:		
n-Heptane	Yes	ENJ, PLC, SOG, TX, UOC.
Heptenes, mixed	No	ENJ, TX.
Hydrocarbons, C ₆ -C ₇ mixtures	No	TX.
Isoheptanes	No	PLC.
All other C ₇ hydrocarbons	No	EKX, PPR.
C₈ Hydrocarbons:		
DI-Isobutylene (DI-Isobutene)	No	EKT, TPC,
n-Octane	No	SOG.
Octenes, mixed	No	ENJ, TX.
2,2,4-Trimethylpentane (Iso-octane)	No	LYP, PLC.
All other C ₈ hydrocarbons	No	SHC.
C₉ and above Hydrocarbons (except alpha olefins):		
Dodecene	Yes	ATR, ENJ, SOC, SUN, UOC.
Elcosane	No	HMY.
Nonene (Tripropylene)	Yes	ATR, ENJ, SOC, SWR, TX, UOC.
Alpha olefins:		
Alpha olefins, C ₈ -C ₁₀	Yes	SHC, SOC, TNA.
Alpha olefins, C ₁₁ and higher	Yes	SHC, SOC, TNA.
N-Paraffins—carbon chain length:		
n-Paraffins, C ₁₀ -C ₁₄	No	ENJ, SHC, TX, UOC.
n-Paraffins, C ₁₀ -C ₁₈	No	VST.
n-Paraffins, C ₁₂ -C ₁₈	No	VST.
n-Paraffins, C ₈ -C ₈	No	SOG, UOC.
n-Paraffins, C ₈ -C ₁₅	No	SHC, SOG, UOC.
All other n-Paraffins	No	ENJ, SOG, UOC.
Polybutene	No	AMO.
Hydrocarbon derivatives:		
n-Butyl mercaptan (1-Butanethiol)	No	PAS, PLC.
sec-Butyl mercaptan (2-Butanethiol)	No	HAP, PLC.
tert-Butyl mercaptan (2-Methyl-2-propanethiol)	No	HAP, PAS, PLC.
DI-tert-butyl disulfide	No	PLC.

See footnotes at end of table.

Table 7—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1988

<i>Primary products from petroleum and natural gas for chemical conversion</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 8)</i>
Aliphatic hydrocarbons—Continued		
Hydrocarbon derivatives—Continued		
Diethyl sulfide (Ethyl sulfide)	No	HAP, PAS.
Dimethyl sulfide	No	PAS.
Ethyl mercaptan (Ethanethiol)	No	HAP, PAS, PLC.
Ethylthioethanol	No	HAP.
Isopropyl mercaptan (2-Propanethiol)	No	HAP, PAS, PLC.
Methyl ethyl sulfide	No	CED, HAP, PAS.
Methyl mercaptan (Methanethiol)	No	PAS.
Octyl mercaptans	No	PAS.
n-Propyl mercaptan (1-Propanethiol)	No	PAS, PLC.
Thiophane (Tetrahydrothiophene)	No	HAP.
All other hydrocarbon derivatives	No	PAS, PLC, SHC.
All other hydrocarbons, C ₉ and above, including mixtures	No	NES, PLC, SOC, TNA.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 8

Primary products from petroleum and natural gas for chemical conversion: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
AMO	Amoco Corp.	LYP	Lyondell Petrochemical Co.
ASH	Ashland Oil, Inc., Ashland Petroleum Co.	MCB	Borg-Warner Corp., Borg-Warner Chemicals
ATR	Atlantic Richfield Co., Arco Chemical Co.	MER	Merichem Co.
BAS	BASF Corp.	MOC	Marathon Petroleum Co., Texas Refining Div.
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	NES	Rutgers-Nease Chemical Co.
CCP	Crown Central Petroleum Corp.	OMC	Olin Corp.
CED	Cedar Chemical Co.	PAS	Pennwalt Corp.
CGO	Citgo Petroleum Corp.	PLC	Phillips 66 Co.
CLK	Clark Oil & Refining Corp.	PPR	Phillips Puerto Rico Core, Inc.
CNE	Cain Chemical, Inc.	PPS	P/P Splitter Venture
CPS	CPS Chemical Co., Inc.	PPX	Phillips Paraxylene, Inc.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.	PSG	PMC Specialties Group, Inc.
CSP	Coastal Refining & Marketing, Inc.	RH	Rohm & Haas Co.
CXI	Chemical Exchange Industries, Inc.	SHC	Shell Oil Co., Shell Chemical Co.
DA	Diamond Shamrock Refining & Marketing	SHO	Shell Oil Co.
DOW	Dow Chemical Co.	SJO	BP Oil Company
DUP	E. I. duPont de Nemours & Co., Inc. Petrochemicals Dept.	SM	Mobil Oil Corp: Gas Liquids Dept. Mobil Chemical Co., Petrochemicals Div.
EKT	Eastman Kodak Co.:	SOC	Chevron Corp., Chevron Chemical Co.
EKX	Tennessee Eastman Co. Div.	SOG	Hill Petroleum Company
ELP	Texas Eastman Co. Div.	SUN	Sun Company, Inc.
ENJ	Rexene Products Company	SWR	Southwestern Refining Co., Inc.
ENJ	Exxon Chemical Americas	TCR	Texas City Refining, Inc.
GRS	Champlin Petroleum Co.	TNA	Ethyl Corp.
GYR	Goodyear Tire & Rubber Co.	TOC	Tenneco Oil Co.
HAP	National Gas Odorizing, Inc.	TPC	Texas Petrochemicals Corp.
HCL	Hoechst Celanese Corp. Bayport works	TU	Tenn-USS Chemicals Co.
HEC	Hewchem	TX	Texaco Chemical Co.
HES	Amerada Hess Corp. (Hess Oil Virgin Islands Corp)	UCC	Union Carbide Corp.
HKO	Occidental Chemical Corp., Olefins Div.	UOC	Union Oil Co. of California
HMY	Humphrey Chemical Co.	UPM	UOP, Inc.
KHI	Koch Refining Co.	USI	Quatum Chemical Corp., USI Div.
KLM	Kalama Chemical, Inc.	UTP	Union Texas Petroleum
		VLR	Valero Refining Co.
		VST	Vista Chemical Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission

Section 3

Cyclic Intermediates

Cyclic intermediates are synthetic organic chemicals derived principally from petroleum and natural gas and from coal-tar crudes produced by destructive distillation (pyrolysis) of coal. Most cyclic intermediates are used in the manufacture of more advanced synthetic organic chemicals and finished products, such as dyes, medicinal chemicals, elastomers (synthetic rubber), pesticides, and plastics and resin materials. Some intermediates, however, are sold as end products without further processing. For example, refined naphthalene may be used as a raw material in the manufacture of 2-naphthol or of other more advanced intermediates, or may be packaged and sold as a moth repellent or as a deodorant. In 1988, about 45 percent of the total output of cyclic intermediates was sold; the rest was consumed chiefly in the producing plants in the manufacture of more advanced intermediates and finished products.

The total annual production of cyclic intermediates during 1984-88 is shown in figure 4. Total production of cyclic intermediates in 1988 amounted to 58,405 million pounds, an

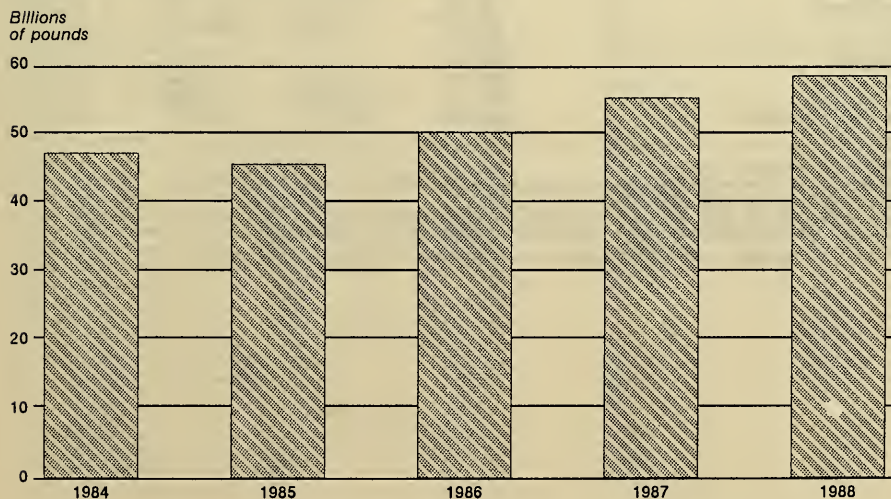
increase of 6 percent compared with production reported to the Commission in 1987. Reported sales of cyclic intermediate chemicals in 1988 were 26,491 pounds, valued at \$9,369 million, compared with 23,206 million pounds, valued at \$7,562 million, in 1987.

Intermediates that were produced in excess of 1 billion pounds in 1988 were terephthalic acid and terephthalic acid dimethyl ester (10,234 million pounds), ethylbenzene (9,929 million pounds), styrene (8,985 million pounds), p-xylene (5,601 million pounds), cumene (4,455 million pounds), phenol (3,562 million pounds), cyclohexane (2,297 million pounds), bisphenol A (1,340 million pounds), cyclohexanone (1,057 million pounds), and aniline (1,029 million pounds). These intermediate chemicals produced in excess of 1 billion pounds accounted for about 83 percent of the total output of cyclic intermediate chemicals produced in 1988.

Table 10 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 11.

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Figure 4
Cyclic Intermediates: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 3

Table 9

Cyclic Intermediates: U.S. production and sales, 1988

Cyclic Intermediates	Production 1,000 pounds	Sales		Average Unit value ¹ Per pound
		Quantity 1,000 pounds	Value 1,000 dollars	
Grand total	58,404,663	26,490,507	9,369,068	\$0.35
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-o-anisidinesulfonic acid)	1,758	(²)	(²)	(²)
p-[(p-Aminophenyl)azo]benzenesulfonic acid	252	(²)	(²)	(²)
Aniline (Aniline oil)	1,029,189	677,900	182,154	.27
Anilinomethanesulfonic acid and salt	478	(²)	(²)	(²)
Biphenyl	60,521	23,702	6,850	.29
Chlorobenzene, mono-	270,711	94,614	26,621	.28
Cresols and cresylic acid ³	82,349	72,147	48,463	.67
Cumene	4,454,525	2,792,735	531,369	.19
Cyclohexane	2,296,732	2,129,326	404,723	.19
Cyclohexanone	1,057,281	157,002	75,463	.48
Dicyclopentadiene (including cyclopentadiene)	130,410	107,266	22,306	.21
2,4-(and 2,6-)Dinitrotoluene	981,606	(²)	(²)	(²)
Ethylbenzene	9,929,277	253,017	73,118	.29
Isocyanic acid derivatives, total	1,706,967	1,430,295	1,188,016	.83
Diphenylmethane-4,4'-diisocyanate (MDI)	364,963	(²)	(²)	(²)
Polyethylene polyphenylisocyanate	589,176	472,146	381,297	.81
Toluene-2,4- and 2,6-diisocyanate (80/20 mixture)	741,573	638,085	548,464	.86
All other Isocyanic acid derivatives	11,255	320,064	258,255	.81
4,4'-Isopropylidenediphenol (Bisphenol A)	1,340,167	422,221	230,301	.55
o-Nitroaniline	8,366	(²)	(²)	(²)
Nonylphenol	201,220	98,325	46,172	.47
Octylphenol	41,964	(²)	(²)	(²)
Phenol, total	3,561,734	1,576,263	601,255	.38
From cumene	2,862,753	1,257,791	472,121	.38
All other phenol	698,981	318,472	129,134	.41
Phthalic anhydride	998,515	575,018	167,669	.29
Sallyclic acid, tech	28,186	(²)	(²)	(²)
Styrene	8,984,474	3,783,186	1,619,678	.43
Terephthalic acid, dimethyl ester ⁴	10,233,949	(²)	(²)	(²)
Tetrahydrofuran	93,804	(²)	(²)	(²)
o-Xylene	970,549	1,077,217	178,348	.17
p-Xylene	5,601,185	3,378,425	734,134	.22
All other cyclic Intermediates	4,338,494	7,841,848	3,232,428	.41

¹ Calculated from unrounded figures.² Reported data were accepted in confidence and may not be published, or no data were reported.³ Does not include data for coke oven and gas-retort ovens.⁴ The figure for terephthalic acid, dimethyl ester (DMT) includes both the acid itself and the dimethyl ester without double counting. The acid production figure was multiplied by the factor 1.16 to convert it to equivalent DMT.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 10

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic Intermediates	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 11)
Cyclic		
Acetoacetanilide	No	BRD, EKT.
o-Acetoacetanilide	No	BRD, EKT.
o-Acetoacetotoluidide	No	BRD, EKT, HCL.
2',4'-Acetoacetylulide	No	EKT.
Acetoacet-m-xyllide	No	BRD.
Acetoguanamine	No	DIX(E).
1'-Acetonaphthone	No	GIV.
Acetophenone, tech	No	S.
p-Acetotoluidide	No	EK.
2-Acetylpyridine	No	RIL.
Adamantane	No	DIX(E).
Aladlene	No	SRL.
Alkylbenzenes:		
Alkylbenzene straight-chain (except dodecyl and tridecyl)	No	MON, PLC.
Dodecylbenzene (Including tridecylbenzene):		
Dodecylbenzene, straight-chain	No	MON, VST.
Dodecylbenzene, other	No	MON.
Alkylphenols, mixed	No	PSG.
Alkylpyridines, mixed	No	RIL, (2).
Aluminum chlorohydroxyphthalocyanine blue	No	PHC.
4'-Aminoacetanilide (Acetyl-p-phenylenediamine)	No	HCL.
3'-Amino-p-acetanilide	No	HCL, SDC.
3-Amino-p-anisilide	No	PSG.
1-Aminoanthraquinone and salt	No	SDC.
p-Aminobenzamide	No	NSC.
1-Amino-4-benzamidoanthraquinone	No	(2).
3'-Aminobenzanilide	No	HCL.
o-Aminobenzenethiol	No	FMT.
p-Aminobenzoic acid, tech	No	NSC, WYK.
2-Amino-6-benzothiazolesulfonic acid	No	VPC.
2-Amino-1-bromo-3-chloroanthraquinone	No	PLC.
1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	No	VPC.
7-Aminocephalosporanic acid	No	BRS, TRD.
2-Amino-5-chloro-4-ethylbenzene	No	TCH.
2-Amino-5-chloropyridine	No	RIL.
6-Amino-5-chloro-m-toluenesulfonic acid [SO ₃ H=1] (2B Acid)	No	DUP, PHC.
6-Amino-2,4-dichloro-3-methylphenol	No	EKT.
4-Amino-N,N-di(β-hydroxyethyl)aniline sulfate	No	WAY.
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-o-anisidinesulfonic acid)	Yes	PSG, VPC, (2).
m-[(4-Amino-3-methoxyphenyl)azo]benzenesulfonic acid	No	VPC.
3-[(4-Amino-5-methoxy-o-tolyl)azo]-1,5-naphthalene-disulfonic acid	No	RUC.
2-Amino-2-methylpropyl 8-bromothioephylinate	No	CHT.
2-Amino-4-methylpyridine	No	RIL.
2-Amino-5-methylpyridine	No	RIL.
2-Amino-4-methylpyrimidine (2-Amino-4-methyl-1,3-diazine)	No	RIL.
3-Amino-2,7-naphthalenedisulfonic acid	No	NES.
2-(4-Amino-2-nitroanilino)ethanol	No	SOM.
2-Amino-4-nitrophenol	No	SOM.
2-[(2-Amino-4-nitrophenyl)amino]-2-hydroxymethyl-1,3-propanediol	No	SOM.
2-Amino-5-nitrothiazole	No	PCW.
2-Amino-4-nitrotoluene hydrochloride	No	PCW.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
3-Amino-2-oxazolidinone	No	BRS.
5-Amino-2-[(2-oxo-5-benzimidazolyl)amino]-benzenesulfonic acid	No	PFZ.
p-Aminophenol	No	MAL.
p-[(p-Aminophenyl)azo]benzenesulfonic acid	Yes	ATL, CGY, VPC.
7-[(4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	No	ACY.
2-Aminopyridine	No	RIL.
2-Aminothiazole nitrate	No	PCW.
4-Amino-m-toluenesulfonic acid [SO ₃ H=1]	No	DUP.
6-Amino-m-toluenesulfonic acid [SO ₃ H=1]	No	DUP, PHC.
Amylphenols, mixed isomers	No	PSG.
Aniline (Aniline oil)	Yes	ART, DUP, FST, ICI, MAL, RUC, USR.
2-Anilinoethanol	No	TCH.
Anilinomethanesulfonic acid and salt	Yes	ACY, ATL, CGY, VPC.
o-Anisidinmethanesulfonic acid	No	CGY, VPC.
Anisole, tech	No	CHF.
Anisoyl chloride	No	SD.
Anthranilic acid (o-Aminobenzoic acid)	No	PSG.
N,N'-(1,5-Anthraquinonylene)dianthranilic acid	No	SDC.
Benzaldehyde, tech	No	KLM.
Benzanilide	No	EK.
Benzenesulfonic acid	No	UPF.
Benzenesulfonic acid, 2-formyl-, sodium salt	No	(²).
Benzenesulfonyl chloride	No	ICI, UPF.
1,2,4-Benzenetricarboxylic acid, 1,2-dianhydride (Trimellitic anhydride)	No	AMO.
Benzhydrol (Diphenylmethanol)	No	PD.
Benzimidazole	No	EK.
1,3-Benzodioxole	No	AMB.
Benzoic acid, 2-[4-(dimethylamino)-benzoyl]	No	(²).
Benzoic acid, methyl ester	No	HCF.
Benzoic acid, tech	No	KLM, PFZ, VEL.
Benzonitrile	No	PSG.
2-Benzothiazolethiol, sodium salt	No	BFG, BKM, USR.
1H-Benzotriazole	No	PSG.
2-Benzoxazolethiol	No	EK.
Benzoyl chloride	No	HK, VEL.
Benzylamine	No	HXL, KLM.
2-(Benzylamino)ethanol	No	HXL.
5-(Benzylethylamino)-o-toluenesulfonic acid	No	HXL.
2-Benzyl-2'-hydroxy-5,9-dimethyl-6,7-benzomorphanhydrobromide	No	SD.
1-Benzyl-4-phenylisonipicotic acid	No	SDW.
Benzyltrichloroacetimidate	No	OMC.
Benzyltriethylammonium chloride	No	HXL.
Benzyltrimethylammonium hydroxide	No	RSA.
Biphenyl	Yes	KHI, MON, SOC, TCC.
1,4-Bis(3-aminopropyl)piperazine	No	TX.
2,6-Bis(p-azidobenzylidene)-4-methylcyclohexanone	No	(²).
N,N-Bis(2-hydroxyethyl)aniline	No	TCH.
N,N-Bis(4-methylphenyl)sulfonylamine, potassium salt	No	EK.
1,2-Bis(tribromophenoxy)ethane	No	GTL.
Bromobenzene, mono	No	DAZ, GTL.
o-Bromobenzoic acid	No	PD.
4-Bromo-3,5-dihydroxybenzamide	No	PCW.
4-Bromo-3,5-dihydroxybenzoic acid	No	PCW.
2-Bromo-4,6-dinitroaniline	No	HCL.
1-Bromo-4-ethoxy-2-methylbenzene	No	(²).

See footnotes at end of table.

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
2-Bromopyridine	No	DAZ.
Butyl p-aminobenzoate	No	WYK.
p-Butylaniline	No	TNA.
p-tert-Butylbenzaldehyde	No	GIV.
n-Butylbenzene	No	PLC.
2-tert-Butyl-p-cresol	No	PSG.
6-tert-Butyl-o-cresol	No	PSG.
tert-Butyldiphenylchlorosilane	No	GGI, NOD.
2-[(1-Butyl-2-methylindol-3-yl) carbonylbenzoic acid	No	(²).
o-sec-Butylphenol	No	SCN, TNA.
o-tert-Butylphenol	No	TNA.
p-sec-Butylphenol	No	SCN.
p-tert-Butylphenol	No	SCN.
Butylphenols, mixed	No	PSG, SCN, (²).
p-tert-Butyltoluene	No	GIV.
6-tert-Butyl-2,4-xylolol	No	GAF, PSG.
4,4'-Carbonylbis[phthalic anhydride]	No	ACH.
N-Carboxy-N-methylantranilic anhydride	No	(²).
4'-Chloroacetophenone	No	LIL.
2-Chloro-4-aminotoluene	No	LMC.
o-Chloroaniline	No	DUP, LMC.
p-Chloroaniline	No	DUP.
p-Chlorobenzaldehyde	No	PD.
Chlorobenzene, mono	Yes	MON, PPG, SCC.
p-Chlorobenzenesulfonic acid	No	UPF.
2-Chloro-1,4-dibutoxybenzene	No	ALL.
1-Chloro-2,5-dibutoxy-4-nitrobenzene	No	ALL.
2-Chloro-1,4-diethoxybenzene	No	ALL.
1-Chloro-2,5-diethoxy-4-nitrobenzene	No	ALL.
4'-Chloro-2',5'-dimethoxyacetanilide	No	HCL.
2-Chloro-1,4-dimethoxybenzene	No	CHF.
2-Chloro-4,6-dimethylaniline	No	EKT.
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	No	SDC.
3-Chlorodiphenylamine	No	SK.
p-[(2-Chloroethyl)methylamino]benzaldehyde	No	VPC.
1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	No	DUP, MON.
1-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	No	DUP, MON.
2-Chloro-4-nitrobenzoic acid	No	SAL.
2-Chloro-4-nitrobenzoic acid, potassium salt	No	SAL.
4-Chloro-3-nitrobenzotrifluoride	No	DAZ.
2-Chloro-4-nitrotoluene	No	DUP, PCW.
2-Chlorophenothiazine	No	SK.
o-Chlorophenylcyclopentyl ketone	No	PD.
N-(4-Chlorophenyl)-N'-(3,4-dichlorophenyl)urea	No	VPC.
4-Chloro-o-phenylenediamine	No	FMT.
4-Chlorophthalic acid	No	PSG.
1-(3-Chloropropyl)-4-methylpiperazine	No	SK.
3-Chloropropyl-2,5-xylol ether	No	PD.
2-Chloropyridine	No	OMC.
4-Chlororesorcinol	No	PCW.
5-Chlorosalicylic acid	No	PCW.
2-(4-Chlorosulfonylphenyl)ethyltrichlorosilane	No	NOD.
7-Chloro-1,2,3,4-tetrahydro-2-methyl-3-(2-methylphenyl)-4-oxo-6-quinolonesulfonamide	No	(²).
o-Chlorotoluene	No	S.
α-Chlorotoluene (Benzyl chloride)	No	MON.
3-Chloro-p-toluidine [NH ₂ =1]	No	DUP.
3-(2-Chloro-4-trifluoromethylphenoxy)toluene	No	(²).

See footnotes at end of table.

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Cyclic intermediates</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued		
4-Chloro- α, α, α -trifluoro-3-nitrotoluene	No	PCW.
p-Chloro- α, α, α -trifluorotoluene	No	HK.
6-Chloro- α, α, α -trifluoro-m-toluidine	No	PCW.
4-Chloro-3,5-xyleneol	No	FER.
Copper, [2,2',2'',2''']-[z9H,31H-phthalacyaninepentyl-pentakis(methylene)]pentakis[1H-isoindole-1,3(2H)-dionato]	No	(²).
Cresols:		
m-Cresol	No	MER.
o-Cresol:		
o-Cresol, from petroleum	No	GE, MER, NPC, PSG.
p-Cresol	No	MER, PSG.
Cresols, mixed:		
(m,p)-Cresol:		
(m,p)-Cresol, from petroleum	No	MER, PSG.
Cresylic acid, refined:		
Cresylic acid, refined; from petroleum	No	MER, NPC, PSG.
Cumene (Isopropyl benzene)	Yes	ASH, BTL, GGC, GRS, KHI, SHC, SOC, TX.
Cumenesulfonic acid	No	NES.
4-(Cyanoacetyl)morpholine	No	DUP.
N-Cyano-s-methyl-N-2(4-methyl-5-imidazolyl)-methylthioethylisothiourea	No	SK.
Cyclohexane	Yes	GRS, PLC, PPR, SOC, SUN, TX, UOC.
1,4-Cyclohexanedicarboxylic acid	No	EKT.
1,2-Cyclohexanedicarboxylic acid anhydride	No	BCC.
Cyclohexanol	No	ACS, BAS, DUP, MON.
Cyclohexanone	Yes	ACS, BAS, CNP, DUP, MON, UCC.
Cyclohexanone oxime	No	CNP.
Cyclohexene	No	USR.
4-Cyclohexene-1,2-dicarboxylic anhydride	No	DKA.
Cyclohexene oxide	No	USR.
β -(1-Cyclohexenyl)ethylamine	No	HXL.
Cyclohexylamine	No	AIP, HCL.
Cyclohexylmethyldimethoxysilane	No	NOD.
Cyclooctadiene	No	DUP.
(2-Cyclopenten-1-yl)-2-propanone	No	GAF.
Cyclopropene carboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-(2-methyl[1,1'-biphenyl]-3-yl) methyl ester	No	NES.
2-Cyclopropylmethylamino-5-chlorobenzophenone	No	PD.
2-(N-Cyclopropylmethyl-N-phthalimidoacetyl)-amino-5-chlorobenzophenone	No	PD.
p-Cymene	No	HPC.
3-Diacetoxyethylaminobenzanilide	No	HCL.
Dialkylbenzene	No	VST.
1,3-Diaminocyclohexane	No	DUP.
4,4'-Diaminodiphenyl sulfone	No	TLI.
2,6-Diaminopyridine	No	RIL.
2,5-Dianilinoterephthalic acid	No	VPC.
m-Dibromobenzene	No	DAZ.
(1,2-Dibromoethyl)benzene	No	DAZ.
Dibromoethyldibromocyclohexane	No	TNA.
2,6-Dibromo-4-nitroaniline	No	HCL.
p-Dibutoxybenzene (DBB)	No	ALL.
2,5-Dibutoxy-4-morpholinobenzenediazonium sulfate salt (DBB Sulfate)	No	ALL.
2,5-Dibutoxy-4-morpholinonitrobenzene	No	ALL.
2-([4-Dibutylamino-2-hydroxy]carbonyl)benzoic acid	No	(²).

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Cyclic intermediates</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 11)</i>
Cyclic—Continued		
3-(Dibutylamino)phenol	No	(²).
Dibutyl-p-cresol	No	PSG.
2,4-Di-tert-butylphenol	No	PSG, SCN.
2,6-Di-tert-butylphenol	No	TNA.
2,6-Di-tert-4-sec-butylphenol	No	CED.
3,4-Dichloroaniline	No	DUP.
o (and p)-Dichlorobenzene	No	SCC.
o-Dichlorobenzene	No	MON, PPG, SCC, SOI.
m-Dichlorobenzene	No	MON.
p-Dichlorobenzene	No	PPG, SCC, SOI.
3,3'-Dichlorobenzidine base and salts	No	CWN, LMC.
3,4-Dichlorobenzotrifluoride	No	HK, (²).
3,5-Dichlorobenzoyl chloride	No	HK.
4,6-Dichloro-1,3-dihydroxybenzene	No	PCW.
Dichlorodiphenylsilane	No	DCC.
2,6-Dichloro-3-methylaniline	No	SDC.
Dichloromethylphenylsilane	No	DCC.
2,6-Dichloro-4-nitroaniline	No	CWN.
1,2-Dichloro-4-nitrobenzene	No	DUP.
2,4-Dichloro-5-nitrotrifluoromethylbenzene	No	DAZ.
(E)-3-(2,4-Dichlorophenyl)-2-(2-nitro-4-trifluoromethylphenyl)propenoic acid	No	SK.
2,6-Dichloropyridine	No	OMC.
p- α -Dichlorotoluene	No	HK.
Dicyclohexylamine	No	AIP.
Dicyclohexylamine, nitrate salt	No	OMC.
Dicyclopentadiene (Includes Cyclopentadiene)	Yes	DOW, ENJ, LYP, SHC, VEL.
α, α -Diethoxyacetophenone	No	CWN.
p-Diethoxybenzene	No	ALL.
2,5-diethoxy-4-morpholinonitrobenzene	No	ALL.
p-(Diethylamino)benzaldehyde	No	VPC.
2-[4-Diethylamino-2-hydroxybenzylbenzoic acid]	No	(²).
4-(Diethylamino)-2-methylbenzaldehyde	No	(²).
3-[(4'-N,N-Diethylamino)phenylazo]-1H-1,2,4-triazole	No	ACY.
3-(Diethylamino)propiophenone	No	TCH.
N,N-Diethylaniline	No	BCC, DUP.
2,6-Diethylaniline	No	TNA.
Diethylbenzene	No	DOW, UPM.
N,N-Diethylcyclohexylamine	No	AIP.
3,5-Diethyl-1,2-dihydro-1-phenyl-2-propylpyridine	No	RIL.
N,N-Diethyl-p-phenylenediamine	No	EK.
3,5-Diethyltoluene-2,4-diamine	No	TNA.
N,N-Diethyl-m-toluidine	No	DUP.
N,N-Diethyl-p-toluidine	No	RSA.
6,11-Dihydrodibenz(b,e)oxepin-11-one	No	PFZ.
2,3-Dihydro-2,2-dimethyl-7-benzofuranol	No	FMN.
2-[2-(2,3-Dihydro-1,3-dioxo-1H-inden-2yl)-(quinoliny)]-6-methylbenzothiazole-7-sulfonic acid	No	VPC.
2,3-Dihydro-2-[6-methyl-7-sulfo-2-benzothiazoly]-2-quinoliny-1,3-dioxo-1H-indene-5-carboxylic acid	No	VPC.
2,4-Dihydroxybenzaldehyde	No	EK.
3,4-Dihydroxybenzoic acid, methyl ester	No	PCW.
2,4-Dihydroxybenzophenone	No	ACY.
N,N-Di(β -hydroxyethyl)-m-chloroaniline	No	MIL.
6,7-Dihydroxy-2-naphthalenesulfonic acid	No	CCC.
Diisobutyl-o-cresol	No	PSG.
m-Diisopropenylbenzene	No	EKT.
Diisopropylaniline	No	TNA.

See footnotes at end of table.

Section 3

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
Diisopropylbenzene	No	EKT, GGC.
2,5-Dimethoxybenzaldehyde	No	CWN.
m-Dimethoxybenzene	No	ACY.
p-Dimethoxybenzene	No	CHF.
m-(Dimethylamino)benzoic acid	No	HIL.
2-[4-(Dimethylamino)benzoyl]benzoic acid	No	EK.
m-Dimethylaminophenol	No	ACY, ALD, BCC.
11-[3(Dimethylamino)propyl]-6H-hydroxydibenz (b,e)oxepin	No	PFZ.
N,N-Dimethylaniline	No	DUP.
2,6-Dimethylaniline	No	TNA.
N,N-Dimethylbenzylamine	No	ARS, HXL.
Dimethyl-1,4-cyclohexanedicarboxylate	No	EKT.
N,N-Dimethylcyclohexylamine	No	AIP.
4,4'-Dimethyldiphenyl ether	No	TNA.
5,5-Dimethylhydantoin	No	BRD.
2,6-Dimethylnaphthalene	No	UPM.
N,N'-Dimethyl-3,4,9,10-perylenetetracarboxylic acid 3, 4:9,10-diimide	No	VPC.
N,N-Dimethyl-o-toluidine	No	RSA.
N,N-Dimethyl-p-toluidine	No	FST, RSA.
m-Dinitrobenzene	No	DUP, FST.
2,4-Dinitrobenzenesulfonic acid, sodium salt	No	EK.
3,5-Dinitrobenzoic acid	No	SAL.
3,5-Dinitrobenzoyl chloride	No	(?).
3,5-Dinitrochlorobenzenesulfonic acid, potassium salt	No	LMC.
2,4-Dinitrophenol, tech	No	SDC.
2,4-Dinitrophenoxyethanol	No	OMC.
3,5-Dinitrosalicylic acid, methyl ester	No	SAL.
p-Dinitrosobenzene	No	LC.
4,4'-Dinitrostilbene-2,2'-disulfonic acid	No	CGY.
2,4-Dinitrotoluene	No	DUP.
2,4 (and 2,6)-Dinitrotoluene	Yes	ICI, MOB, RUC, (?).
3,5-Dinitro-p-toluenesulfonic acid	No	GAF, SCN.
3,5-Dinitro-o-toluic acid	No	SAL.
Dinonylhydroxybenzenesulfonic acid	No	(?).
Dinonylphenol	No	TX.
DI-para-benzoquinone dioxime	No	LC.
2,4-DI-tert-pentylphenol	No	PAS.
Diphenylamine	No	ART, RUC, USR.
Diphenyldimethoxysilane	No	NOD.
Diphenyldisulfide	No	PAH.
1-Diphenylhydrazine	No	EKT.
Diphenyl phthalate	No	EK.
1,3-DI-4-piperidylpropane	No	RII.
2,5-DI-p-toluidinoterephthalic acid	No	VPC.
1,5-Diureldonaphthalene	No	SOI.
Divinylbenzene	No	DOW, JSC.
1,1-DI-3,4-xylene	No	ACH.
Dodecylnitrobenzene	No	LMC.
p-Dodecylphenol	No	GAF, MON, SOC.
5-Ethanoxy-3-trichloromethyl-1,2,4-thiadiazole	No	OMC.
Ethisterone	No	SRL, UPJ.
1-Ethoxy-3-methylbenzene	No	(?).
4-Ethoxy-2-methyl-N-phenylaniline	No	(?).
o-Ethylaniline	No	TNA.
N-Ethylaniline, refined	No	BCC, FST.
2-(N-Ethylanilino)ethanol	No	TCH.
3-(N-Ethylanilino)propionitrile	No	TCH.

See footnotes at end of table.

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
α -(N-Ethylanilino)-m-toluenesulfonic acid	No	HIL.
Ethylbenzene	No	AMO, ATR, CSD, DOW, ELP, HCL, KHI, MCB, SOC, SOG.
2-(N-Ethyl-N, β -cyanoethyl)-4-acetaminoisole	No	TCH.
6-Ethyl-2-methylaniline	No	TNA.
2-[Ethyl(3-methylphenyl)amino]ethanol	No	FST.
Ethyl 2(2-nitro-4-trifluoromethylphenyl)-3-oxobutanoate	No	SK.
N-Ethyl-N-phenylbenzylamine	No	HIL.
3-Ethylpyridine	No	RIL.
5-Ethyl-2,3-pyridinedicarboxylic acid	No	NES.
N-Ethyl-m-toluidine	No	DUP, FST.
3-(N-Ethyl-m-toluidino)propionitrile	No	TCH.
1-Ethynyl-1-cyclohexanol	No	OMC.
9-Fluorenone	No	MCK.
1-Formylpiperidine	No	RIL.
Furan	No	QKO.
Furfuryl alcohol	No	QKO.
Furfurylamine	No	HXL.
1-(2-Furoyl)piperazine	No	PFZ.
Hexachlorocyclopentadiene	No	VEL.
1,4,5,6,7,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendic anhydride)	No	VEL.
Hexamethylenimine	No	CXI, DUP.
Hydroquinone, tech	No	EKT, GYR.
p-Hydroxybenzaldehyde	No	WES.
p-Hydroxybenzenesulfonic acid	No	UPF.
p-Hydroxybenzoic acid	No	LEM.
4-Hydroxy-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	No	PFZ.
4-Hydroxybenzylbenzene	No	TNA.
2'-Hydroxy-5,9-dimethyl-6,7-benzomorphan	No	SD.
2,2'-[[4-(2-Hydroxyethylamino)-3-nitrophenyl]imino]diethanol	No	SOM.
3-[N-(2-Hydroxyethyl)anilino]propionitrile	No	TCH.
N- β -Hydroxyethyl-2,4-dihydroxybenzamide	No	PCW.
4-Hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	No	PFZ.
2-Hydroxymethylene-17 α -ethinylandroster-17 β -ol-4-en-3-one	No	SD.
3-Hydroxy-N-(3-N-morpholino- γ -propyl)-2-naphthimide	No	PCW.
6-Hydroxy-2-naphthalenesulfonic acid, sodium salt	No	HIL.
1-Hydroxy-2-naphthol acid	No	PCW.
3-Hydroxy-2-naphthol acid (B.O.N.)	No	PCW.
3-Hydroxy-2-naphthol acid, ethanalamide	No	PCW.
1-Hydroxynaphthol acid, methyl ester	No	PCW.
3-Hydroxy-2-naphthol acid, methyl ester	No	PCW.
3-Hydroxy-2-naphthol acid, sodium salt	No	PCW.
1-Hydroxy-6-octadecyloxy-2-naphthol acid	No	(?)
p-Hydroxyphenylglycine potassium methyl dane salt	No	KAN.
5-Indanol	No	(?)
Isatolic anhydride	No	PSG.
Isobutylbenzene	No	PLC, TNA.
Isobutyrophenone	No	ARS.
Isocyanic acid derivatives:		
Bitoluene diisocyanate (TODI)	No	CWN.
Diphenylmethane-4,4'-diisocyanate (MDI)	Yes	BAS, DOW, ICI, MOB, RUC.
Polymethylene polyphenylisocyanate	Yes	BAS, ICI, MOB, RUC.
Toluene 2,4-diisocyanate	No	MOB.
Toluene 2,4- and 2,6-diisocyanate (80/20 mixture)	Yes	BAS, DOW, ICI, MOB, OMC, RUC.
Toluene 2,4- and 2,6-diisocyanate (65/35 mixture)	No	MOB.
p-Toluenesulfonyl isocyanate	No	CWN.

See footnotes at end of table.

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
Isonicotinic acid	No	RIL.
Isonicotinonitrile	No	RIL.
Isophthalic acid (Benzene-1,3-dicarboxylic acid)	No	AMO.
Isophthalic acid, dimethyl ester	No	UTC.
Isophthalonitrile	No	DUP, PSG.
Isophthaloyl chloride	No	DUP, TLC.
Isopropylbiphenyl	No	TCC.
5,5'-Isopropylidenebis(2-hydroxy-m-xylene- α , α' -diol)	No	ARK.
4,4'-Isopropylidenediphenol (Bisphenol A)	Yes	ART, DOW, GE, SHC.
4,4'-Isopropylidenediphenol, ethoxylated	No	ICI.
4,4'-Isopropylidenediphenol, propoxylated	No	ICI.
o-Isopropylphenol	No	FMC, TNA.
Isopropylphenol, mixed	No	PSG.
2,6-Lutidine	No	RIL.
Malonanilide	No	PCW.
Melamine	No	ACY, MLC.
dl-p-Mentha-1,8-diene (Limonene)	No	ARZ, NCI.
N-(2-Methoxy-1-naphthyl)acetamide	No	SDC.
(p-Methoxyphenyl)acetic acid	No	HEX.
2-(N-Methylanilino)ethanol	No	TCH.
3-(N-Methylanilino)propionitrile	No	TCH.
2-Methylantraquinone	No	ACY.
Methyl-2-benzimidazole carbamate	No	CED.
4-Methylbenzotriazole	No	VPC.
o-Methylbenzoyl chloride	No	TLC.
N-Methylbenzylamine	No	HXL.
o-Methylbenzyl chloride	No	ICI.
Methyl benzyl ether	No	GRS.
Methylcyclohexane	No	PLC.
Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboate	No	FMN.
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	No	CPS.
4-Methyl-2,6-dinitrophenol	No	PSG.
N-Methyleneaniline	No	PCW.
4,4-Methylenebis(2,6-di-tert-butylphenol)	No	TNA.
4,4'-Methylenebis[N,N-diethylaniline]	No	ACY.
4,4'-Methylenebis[N,N-dimethylaniline] (Methane base)	No	ACY.
2,2'-Methylenebis(4-methyl-6-nonyl-p-cresol)	No	PSG.
4,4'-Methylenedianiline	No	RUC, USR.
Methylenedicyclohexylmethane 1,4-disocyanate	No	MOB.
Methylene diphenylamine (polymeric)	No	MOB.
5,5'-Methylenedisalicylic acid	No	KLM.
Methyl p-formylbenzoate	No	EKT.
(2,4-Methyl-5-imidazolyl)methylthioethylamine dihydrochloride	No	SK.
2-Methylindole	No	(²).
4-Methyl-N-(4-methylphenyl)sulfonyl benzenesulfonamide	No	EK.
Methyl nicotinate	No	RIL.
N-Methyl-p-nitroaniline	No	ACY, USR.
4-Methyl-2-nitroanisole	No	PSG.
3-Methyl-2-nitrobenzoic acid	No	SAL.
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	No	BCC.
2-Methyl-1-octyl-1	No	(²).
4-Methylphthalic acid	No	EK.
4-(4'-Methylpiperidine)pyridine	No	RIL.
α -Methylstyrene	No	GGC, TX.
ar-Methylstyrene (Vinyltoluene)	No	ART, BTL.

See footnotes at end of table.

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
Mono-, di-, and triesters of phenyl (2,3,4-trihydroxyphenyl) methanone with 6-diazo-5,6-dihydro-5-oxo-1-naphthalenesulfonic acid	No	WAY.
Myristylbenzyltrimethylammonium chloride.2H ₂ O	No	PCW.
1-Naphthaldehyde	No	GNW.
2-Naphthalenesulfonic acid	No	ACY, EK.
1-Naphthalenesulfonic acid, 8-(phenylamino)-monosodium salt	No	SDC.
2-Naphthalenesulfonic acid, sodium salt	No	GNW.
Naphthalimide	No	VPC.
1-Naphthylamine (α -Naphthylamine)	No	DUP.
p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2-naphthylamine)	No	SDC.
Nicotinonitrile (3-Cyanopyridine)	No	NEP, RIL.
3-Nitro-6-pyrrolodinytoluene	No	ALL.
o-Nitroaniline	Yes	BUC, DUP, MON.
p-Nitroaniline	No	DUP, MON.
5-Nitroanthranilic acid	No	TLI.
1-Nitroanthraquinone	No	SDC.
p-Nitrobenzamide	No	PD.
Nitrobenzene	No	FST, ICI, MOB, RUC.
m-Nitrobenzenesulfonic acid, sodium salt	No	USM.
o-Nitrobenzoic acid	No	SAL.
m-Nitrobenzoic acid	No	HIL, SAL.
p-Nitrobenzoic acid	No	DUP.
m-Nitrobenzoic acid, sodium salt	No	SAL.
2-Nitro-N-benzoylaniline	No	SAL.
2-Nitro-p-cresol	No	PSG.
5-Nitrodimethylisophthalate	No	SAL.
Nitrodiphenylamine	No	ACY, MON.
5-Nitroisophthalic acid	No	LMC, SAL.
3-Nitro-4-methylacetophenone	No	TLI.
1-Nitronaphthalene	No	DUP.
p-Nitrophenethyl alcohol	No	PCW.
o-Nitrophenol	No	MON.
p-Nitrophenol	No	DUP, MON.
p-Nitrophenol, sodium salt	No	DUP.
2-Nitro-N'-phenyl-p-phenylenediamine	No	SOM.
5-Nitrosalicylaldehyde	No	EK.
p-Nitrosophenol	No	SDC.
4-Nitrosophenol, sodium salt	No	SDC.
o-Nitrotoluene	No	DUP, FST.
m-Nitrotoluene	No	DUP, FST.
p-Nitrotoluene	No	DUP, FST.
Nitrotoluene mixtures	No	FST.
(2-Nitro-4-trifluoromethylphenyl)acetic acid	No	SK.
Nonylphenol	Yes	GAF, KLM, MCB, MON, RH, SCN, TX.
2-Octanoylhydroquinone	No	EKT.
Octylphenol	Yes	PSG, RH, SCN.
Octylphenoxydiethoxy chloride	No	RH.
3-Oxo-1,2-benzisothiazoline-2-acetic acid, methyl ester, 1,1-dioxide	No	PFZ.
5-Oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	No	HCL.
Oxylaluminum benzoate	No	CHT.
4,4'-Oxydianiline	No	DUP.
Pentabromochlorocyclohexane	No	DOW.

See footnotes at end of table.

Section 3

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
o-Pentylphenol (o-Amylphenol)	No	(²).
p-tert-Pentylphenol	No	PAS, SCN.
Permethrin acid chloride	No	CED.
3,4,9,10-Perylenetetracarboxylic acid	No	PAS.
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-dianhydride	No	VPC.
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-dl'imide	No	VPC.
1,10-Phenanthroline	No	VNC.
2-Phenethylamine	No	HXL.
p-Phenetidine	No	HCL, MNA.
Phenol:		
Natural:		
From petroleum:		
Phenol, natural, from petroleum, U.S.P.	No	MER.
All other Phenol, natural, from petroleum	No	PSG.
Synthetic:		
Phenol, benzylated	No	MIL.
Phenol, styrenated	No	MIL, PSG.
Phenol, synthetic, from cumene by oxidation, U.S.P.	Yes	ACS, ART, BTL, DOW, GE, GGC, TX.
Phenol, synthetic, from toluene by oxidation, U.S.P.	No	KLM.
All other phenol, synthetic	No	SHC.
Phenolsulfonaphthalein, sodium salt	No	ART, EK.
Phenolsulfonic acid	No	PSG.
Phenolsulfonic acid, sodium salt	No	SAL.
Phenoxyacetic acid, sodium salt	No	NCC.
3-Phenoxybenzaldehyde	No	TNA.
3-Phenoxybenzaldehyde cyanohydrin	No	TNA.
3-Phenoxybenzenemethanol	No	TNA.
m-Phenoxytoluene	No	MER.
4'-Phenylacetophenone	No	ANG.
4-(Phenylazo)diphenylamine	No	EK.
2-Phenylbenzimidazole	No	SAL.
m-Phenylenebismaleimide	No	NES.
o-Phenylenediamine	No	DUP, PSG.
m-Phenylenediamine	No	DUP, FST.
p-Phenylenediamine	No	DUP.
Phenyl ether (Diphenyl oxide)	No	DOW, MON.
d(+)- α -Phenylethylamine	No	HXL.
N-Phenylglycine	No	EK.
Phenylglycine, sodium salt	No	BCC, LIL.
2,2'-(Phenyl)iminodisethanol (N-Phenyldiethanolamine)	No	MIL, TCH.
2,2'-(Phenyl)iminodisethanol, diacetate ester	No	TCH.
Phenylmercuric carboxylate	No	COS.
o-Phenylphenol	No	DOW.
p-Phenylphenol	No	DOW.
o-Phenylphenol, sodium salt	No	DOW.
N-Phenyl-p-phenylenediamine	No	USR.
1-Phenyl-1,2-propanedione, 2-oxime	No	ORT.
4-Phenylpropylpyridine	No	RIL.
Phenyltriethoxysilane	No	NOD.
Phthalic acid	No	EK.
Phthalic anhydride	Yes	ART, BAS, ENJ, KPT, STP, TU, USR.
Phthalimide	No	PSG.
[Phthalocyaninato(2-)]copper	No	PHC.
[Phthalocyaninetetramethanaminato]copper	No	(²).
Phthalocyaninetetrasulfonyl chloride, copper derivative	No	VPC.
Phthaloyl chloride (Phthalyl chloride)	No	TLC.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
Picolines:		
Picoline (3,4-mixture)	No	RIL.
2-Picoline (α -Picoline)	No	RIL.
3-Picoline (β -Picoline)	No	NEP, RIL.
4-Picoline (γ -Picoline)	No	RIL.
3-Picoline-N-oxide	No	RIL.
Picolinonitrile (2-Cyanopyridine)	No	NEP.
3-Picolylamine	No	RIL.
Pleric acid (Trinitrophenol)	No	SDC.
Piperidine	No	AIP, RIL.
Polyethylbenzene (80 percent diethylbenzene)	No	ELP.
4-Propanolpyridine	No	RIL.
Propiophenone	No	ORT.
8,16-Pyranthredione	No	PCW.
1,3,6,8-Pyrenetetrasulfonic acid	No	(²).
2-Pyridinecarboxaldehyde	No	LC.
Pyridine, refined:		
2 Pyridine, refined	No	NEP.
Pyridine, refined all other grades	No	RIL.
Pyridine hydrochloride	No	RSA.
3-Pyridinemethanol	No	RIL.
2-Pyridinethiol-1-oxide, sodium salt	No	OMC.
2-Pyridinethiol-1-oxide, zinc salt	No	OMC.
4-Pyridylacetone	No	RIL.
Pyrogallol	No	FSN.
Pyromellitic dianhydride	No	ACH.
2-Pyrrolidinone (2-Pyrrolidone)	No	GAF.
Pyrvinium pamoate	No	(²).
Quinoline:		
Quinoline-2,3-dicarboxylic acid	No	NES.
Quinoline, other grades	No	ATL.
8-Quinolol	No	SOM.
Resorcinol, dimethyl ether	No	BAS.
Resorcinol, tech.	No	KPT.
α -Resorcylic acid, lead salt	No	KPT.
Salicylaldehyde	No	RDA, WES.
Salicylaldehyde oxime	No	EK.
Salicylanilide	No	PCW.
Salicylic acid, tech	Yes	DOW, HIL, KLM, MON.
Sodium p-sulfophenylmethallyl ether	No	SAL.
Sodium trichlorobenzenesulfate	No	UPF.
Spro[3H-1,2-benzoxathiole-3,9'-[9H]-xanthene]		
-3',6'-diol-1,1-dioxide	No	(²).
Styrene (Vinylbenzene)	Yes	AMO, ATR, CSD, DOW, ELP, HCL, MCB, PLC, SC, SHC, SOC.
Sulfaguanidine	No	SAL.
m-Sulfobenzoic acid, monosodium salt	No	EKT.
5-Sulfoisophthalic acid, 1,3-dimethyl ester	No	DUP, PCW.
5-Sulfoisophthalic acid, lithium salt	No	EKT.
5-Sulfoisophthalic acid, sodium salt	No	EKT, PCW.
4,4'-Sulfonyldiphenol (4,4'-Dihydroxydiphenyl sulfone)	No	CRZ.
4-Sulfothalic acid	No	CWN.
Terephthalic acid	No	AMO, DUP, HCF.
Terephthalic acid, dimethyl ester	Yes	DUP, EKT, HCF.
Terephthaloyl chloride	No	DUP, TLC.
Terphenyl (Phenylbiphenyl) (m-, o-, and p-Isomers)	No	MON.
Terpinene-4-ol	No	(²).
1-Tert-butyl-2,5-dimethoxybenzene	No	EKT.

See footnotes at end of table.

Section 3

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11)
Cyclic—Continued		
Tetrabromophthalic anhydride	No	TNA.
Tetrachlorophthalic anhydride	No	MON.
Tetrahydrobenzyl alcohol	No	UCC.
Tetrahydrofuran	Yes	BAS, DUP, QKO.
1,2,3,4-Tetrahydro-2-naphthol	No	GAF.
2,2',3,3'-Tetrahydro-3,3,3',3'-tetramethyl-1,1'-sprobil [1H-Indene]-5,5',6,6'-tetrol	No	(?).
1,2,4,5-Tetramethylbenzene (Durene)	No	KHI.
p-(1,1,3,3-Tetramethylbutyl)phenol	No	GAF.
3,3,4,4-Tetramethylphenol ether	No	TNA.
1,3,6,8-Tetranitro-9H-carbazole	No	SDC.
Thiodiphenol	No	CRZ.
Thionicotinamide	No	RIL.
Thiophenol	No	ICI.
Toluene-2,3-(and 3,4)-diamine (35/65 mixture)	No	OMC.
Toluene-2,4-diamine (4-m-Tolylenediamine)	No	RUC, (?).
Toluene-2,4-(and 2,6)-diamine (80/20 mixture)	No	MOB, OMC.
Toluene-3,4-diamine	No	(?).
p-Toluenesulfonamide	No	UTC.
p-Toluenesulfonic acid	No	TEN, UPF.
p-Toluenesulfonic acid, aniline salt	No	NES.
o-Toluenesulfonyl chloride	No	UPF.
m-Toluic acid	No	WTC.
p-Toluic acid, methyl ester	No	HCF.
o-Toluidine	No	DUP, FST.
m-Toluidine	No	DUP, FST.
p-Toluidine	No	DUP, FST.
2-o-Toluidinoethanol	No	TCH.
p-Toluoyl chloride	No	EKT.
2,2'-(m-Tolylimino)diethanol	No	MIL, TCH.
Tolyltriazole	No	PSG.
1,2,4-Triacetoxycyclohexane	No	SOM.
2,4,6-Triamino-5-nitrosopyrimidine	No	SK.
2,4,6-Tribromophenol	No	GLT.
3,4',5-Tribromosalicylanilide	No	PCWG.
1,2,3-(and 1,2,4)-Trichlorobenzene	No	PPG, SCC.
1,2,4-Trichlorobenzene	No	SCC.
1,1,1-Trichloro-2,2-diphenylethane	No	CWN.
3-Trichloromethyl-1,2,4-thiadiazole	No	OMC.
1,2,4-Trichloro-5-nitrobenzene	No	PCW.
2,4,6-Trichlorophenyldiazine	No	EKT.
Trichlorophenylsulfane	No	DCC.
3,5,6-Trichlorosalicylic acid	No	SK.
α,α,α -Trichlorotoluene (Benzotrichloride)	No	HK, VEL.
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	No	DGC.
Tri(dimethylaminomethyl)phenol	No	PEL.
Trimellitic anhydride, acid chloride	No	(?).
Trimellitic trichloride	No	TLC.
Trimesic acid	No	AMB.
1,2,4-Trimethylbenzene (Pseudocumene)	No	ABB, KHI.
1,3,5-Trimethylbenzene (Mesitylene)	No	KHI.
1,3,3-Trimethyl- δ^2 , α -indolineacetaldehyde	No	VPC.
1,3,3-Trimethyl-2-methyleneindoline	No	(?).
Triphenylmethane	No	EK.
Triphenylphosphine	No	(?).
Triphenylsulfonium chloride	No	SOM.
α,α',α'' -Tris(dimethylamino)mesitol	No	RH.
Tris(2-methyl-1-aziridinyl)phosphine oxide	No	ARS.

See footnotes at end of table.

Table 10—Continued

Cyclic Intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic Intermediates	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 11)
Cyclic—Continued		
7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid] (J-Acid urea)	No	S.
Veratraldehyde (3,4-Dimethoxybenzaldehyde)	No	GIV.
Vinylcyclohexene monoxide	No	UCC.
2-Vinylpyridine	No	RIL.
4-Vinylpyridine	No	RIL.
o-Xylene (90-100% of o-xylene isomer)	Yes	ENJ, KHI, LYP, PLC, PPR, TOC.
m-Xylene (90-100% of m-xylene isomer)	No	AMO, PLC.
p-Xylene (90-100% of p-xylene isomer)	Yes	AMO, ENJ, KHI, LYP, PLC, PPX, SOC, STX, TOC.
2,4-Xylenesulfonic acid	No	UPF.
Xylenesulfonic acid, mixed isomers	No	NES.
2,5-Xylenol	No	PSG.
2,6-Xylenol	No	GE.
3,5-Xylenol	No	PSG.
Xylenol crystals	No	HXL.
Xylenols:		
Xylenol, low boiling point	No	MER.
Xylidines:		
Xylidine, original mixture	No	DUP.
All other cyclic intermediates	Yes	ACY, ATL, BRD, BRS, DUP, EK, EKT, GGI, HCF, HCL, HK, HXL, LC, MRT, NOD, OMC, PAH, PCW, PD, PFZ, PSG, RIL, SAL, SCH, SD, SDC, SDW, SOM, TCH, TNA, TRD, UCC, UPJ, UPJ, UPJ, UPJ, VPC, (2), (2), (2), (2), (2), (2), (2).

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 11

Cyclic Intermediates: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ABB	Abbott Laboratories	FMT	Fairmount Chemical Co., Inc.
ACH	Alcoo Chemical Corp.	FSN	Nor-Am Chemical Co.
ACS	Allied Signal Inc., Engineered Material Sector	FST	First Chemical Corp.
ACY	American Cyanamid Co.	GAF	GAF Corp., Chemical Group
AIP	Air Products & Chemicals, Inc.	GE	General Electric Co.
ALD	Aldrich Chemical Co., Inc.	GGC	Georgia-Gulf Corp.: Houston Div. Plaquemine Div.
ALL	Alliance Chemical, Inc.	GGI	Grow Group, Inc.
AMB	American Bio-Synthetics Corp.	GIV	Givaudan Corp
AMO	Amoco Corp.	GNW	Greenwood Chemical Co.
ANG	Angus Chemical Co.	GRS	Champlin Petroleum Co.
ARK	Armstrong World Industries, Inc.	GTL	Great Lakes Chemical Corp.
ARS	Arsynco, Inc.	GYR	Goodyear Tire & Rubber Co.
ART	Aristech Chemical Corp., Chemical Div.	HCY	Cape Industries
ARZ	Arizona Chemical Co.	HCL	Hoechst Celanese Corp.: Bayport Works Fine Chemicals Div. Rhode Island Works Sou-Tex Works
ASH	Ashland Oil, Inc., Ashland Petroleum Co.	HEX	Hexagon Laboratories, Inc.
ATL	Atlantic Industries, Inc.	HIL	Hilton Davis Co.
ATR	Atlantic Richfield Co., Arco Chemical Co.	HK	Occidental Chemical Corp., Specialty Chemical Div.
BAS	BASF Corp.	HPC	Hercules, Inc.
BCC	Buffalo Color Corp.	HXL	Hexcel Corp., Hexcel Chemical Products
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	ICI	ICI Americas, Inc., Agricultural Chemicals Div. Chemicals Div. Polyurethanes Group.
BKM	Buckman Laboratories, Inc.	JSC	Sybron Chemicals, Inc.
BRD	Lonza, Inc.	KAN	Kanasco, Ltd
BRS	Bristol-Myers Co.	KHI	Koch Refining Co.
BTL	BTL Specialty Resin Corp.	KLM	Kalama Chemical, Inc.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	KPT	Beazer Materials & Services, Inc.
CCC	C.N.C. International, Inc.	LC	Lord Corp., Chemical Products Group
CED	Cedar Chemical Co.	LEM	Napp Chemicals, Inc.
CGY	Clba-Gelgy Corp.	LIL	Eli Lilly & Co.
CHF	Kincaid Enterprises, Inc.	LMC	Lomac, Inc.
CHT	Chattem, Inc.	LYP	Lyondell Petrochemical Co.
CNP	DSM Chemicals Augusta, Inc.	MAL	Mallinckrodt, Inc.
COS	Cosan Chemical Corp.	MCB	Borg-Warner Corp., Borg-Warner Chemicals
CPS	CPS Chemical Co., Inc.	MCK	MacKenzie Chemical Works, Inc.
CRZ	James River Corp.	MER	Merichem Co.
CSD	Fina Oil & Chemicals Co., Cosden Chemical Div.	MIL	Milliken & Co., Milliken Chemical Div.
CWN	Upjohn Co., Fine Chemical	MLC	Melamine Chemicals, Inc.
CXI	Chemical Exchange Industries, Inc.	MNA	Monsanto Agriculture Co.
DAZ	Diaz Chemical Corp.	MOB	Mobay Chemical Corp. Pittsburgh Div.
DCC	Dow Corning Corp.	MON	Monsanto Co.
DGC	Degussa Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Div.
DIX	Dixie Chemical Co., Inc.	NCC	Niacet, Corp.
DKA	Mobay Synthetics Corp.	NCF	Union Camp Corp., Terpene & Aromatics Div.
DOW	Dow Chemical Co.	NEP	Nepera, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Agricultural Products Chemicals and Pigments Dept. Petrochemicals Dept.	NES	Ruetgers-Nease Chemical Co.
EK	Eastman Kodak Co.:	NOD	Huls America, Inc.
EKT	Tennessee Eastman Co. Div.	NPC	Northwest Petrochemical Corp.
ELP	Rexene Products Company		
ENJ	Exxon Chemical Americas		
FER	Ferro Corp., Ferro Chemical Div.		
FMC	FMC Corp.:		
FMN	Agricultural Chemical Group		

Table 11—Continued

Cyclic Intermediates: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
NSC	National Starch & Chemical Corp.	SOC	Chevron Corp., Chevron Chemical Co.
OMC	Olin Corp.	SOG	Hill Petroleum Company
ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.	SOI	Specialty Organics, Inc.
PAH	Parish Chemical Co.	SOM	Southland Corp.
PAS	Pennwalt Corp.	SRL	G. D. Searle & Co.
PCW	Pfister Chemical, Inc.	STP	Stepan Chemical Co.
PD	Parke-Davis Div. of Warner-Lambert Co.	STX	St. Croix Petrochemical Corp.
PEL	Pelron Corp.	SUN	Sun Company, Inc.
PFZ	Pfizer, Inc., & Pfizer Pharmaceuticals, Inc.	TCC	Sybron Chemical, Inc.
PHC	Phthalchem, Inc.	TCH	Quantum Chemical Corp.
PLC	Phillips 66 Co.	TEN	Tennessee Chemical Co.
PPG	PPG Industries, Inc.	TLC	Twin Lake Chemical, Inc.
PPR	Phillips Puerto Rico Core, Inc.	TLI	Teledyne Industries Inc., Teledyne McCormick Selph
PPX	Phillips Paraxylene, Inc.	TNA	Ethyl Corp.
PSG	PMC Specialities Group Inc.	TOC	Tenneco Oil Co.
QKO	QO Chemicals, Inc.	TRD	Squibb Manufacturing, Inc.
RDA	Rhone-Poulenc, Inc.	TU	Tenn-USS Chemicals Co.
RH	Rohm & Haas Co.	TX	Texaco, Inc., Texaco Chemical Co.
RIL	Reilly Industries, Inc.	UCC	Union Carbide Corp.
RSA	R.S.A. Corp.	UOC	Union Oil Co., of California
RUC	Rubicon, Inc.	UPF	Sloss Industries
S	Sandoz, Inc.	UPJ	Upjohn Co
SAL	Salsbury Laboratories, Inc.	UPM	UOP, Inc.
SC	Sterling Chemicals, Inc.	USM	Crown Metro, Inc.
SCC	Standard Chlorine of Delaware, Inc.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SCH	The Schering Corp.	UTC	Unitex Chemical Corp.
SCN	Schenectady Chemicals, Inc.	VEL	Velsicol Chemical Corp.
SD	Sterling Drug, Inc., Sterling Pharmaceuticals, Inc.	VNC	Vanderbilt Chemical Corp.
SDC	Sandoz Chemicals Corp. Sterling Drug, Inc.:	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
SDW	Sterling Organics Div.	VST	Vista Chemical Co.
SHC	Shell Oil Co., Shell Chemical Co.	WAY	Olin Hunt Specialty Products, Inc.
SK	SmithKline Chemicals	WES	Wesley Industries
		WTC	Witco Chemical Corp.
		WYK	Wyckoff Chemical Co., Inc.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission

Section 4

Dyes

Synthetic dyes are derived in whole or in part from cyclic intermediates. Approximately two-thirds of the dyes consumed in the United States are used by the textile industry to dye natural and synthetic fibers or fabrics; about one-sixth is used for coloring paper; and the rest is used chiefly in the production of organic pigments and in dyeing leather and plastics. Of the several thousand different synthetic dyes that are known, more than one thousand are manufactured by domestic producers, collectively. The large number of dyes results from the many different types of materials to which dyes are applied, the different conditions of service for which dyes are required, and the cost that a particular use can bear. Commercial dyes are formulated products which are sold in a variety of physical forms (e.g.) granular, powders, liquids, and pastes) containing concentrations of colorant ranging from 6 percent (approximately) to 100 percent. In the statistical tables, production and sales quantities are expressed in terms of a standard strength of product (based on dyeing performance) and not in terms of the amount of actual colorant.

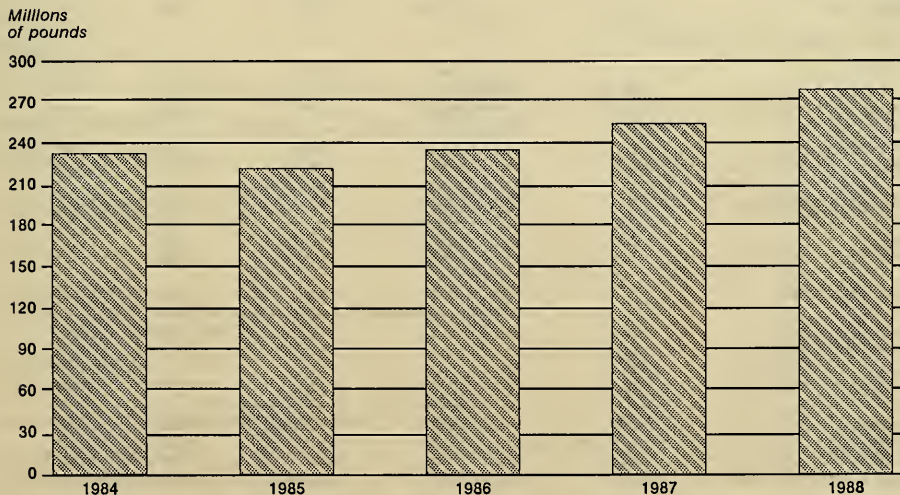
Total domestic production of dyes in 1988 amounted to 280 million pounds, or 10 percent more than the 255 million pounds produced in 1987 (table 12). Sales of dyes in 1988 amounted to 251 million pounds, valued at \$766 million, compared with 230 million pounds, valued at \$677 million, in 1987. In terms of quantity, sales of dyes in 1988 was 9 percent higher, and in terms of value 13 percent higher. The average unit value of sales of all dyes in 1988 was \$3.05 per pound, compared with \$2.95 per pound in 1987.

Production of three classes of dyes decreased in 1986, while the remaining seven major classes increased their production. Fiber-reactive dyes and fluorescent brightening agents registered significant increases in 1988 while mordant dyes registered a significant decline. Changes in U.S. production of synthetic dyes followed overall changes in U.S. economic activity during 1984-88 (see figure 5).

Table 13 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 14.

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202-252-1363

Figure 5
Dyes: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 4

Table 12

Dyes: U.S. production and sales, 1988

Dyes	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	280,387	250,838	766,148	\$3.05
Acid dyes				
Total	17,779	15,372	75,338	4.90
Acid yellow dyes, total	2,962	2,395	9,380	3.92
Acid Yellow 17	92	84	634	7.56
Acid Yellow 23	104	102	490	4.81
All other acid yellow dyes	2,766	2,209	8,256	3.74
Acid orange dyes, total ¹	4,689	3,217	8,243	2.56
Acid Orange 8	108	109	319	2.93
All other acid oranges dyes	4,581	3,108	7,924	2.55
Acid red dyes, total	2,487	2,827	17,883	6.33
Acid Red 1	213	215	707	3.28
Acid Red 137	37	42	361	8.51
Acid Red 182	607	411	2,471	6.01
All other acid red dyes	1,630	2,159	14,344	6.65
Acid violet dyes	89	74	704	9.51
Acid blue dyes total	4,893	4,338	26,986	6.22
Acid Blue 324	1,896	1,672	10,058	6.01
All other acid blue dyes	2,997	2,666	16,928	6.35
Acid green dyes	182	167	1,486	8.90
Acid brown dyes	759	692	3,269	4.72
Acid black dyes	1,718	1,662	7,387	4.45
Basic dyes (classical and modified)				
Total	13,846	12,591	72,575	5.76
Basic yellow dyes, total	3,899	3,526	14,054	3.99
Basic Yellow 11	148	170	794	4.66
Basic yellow dyes, all other, modified	3,751	3,356	13,260	3.95
Basic orange dyes, total	732	699	3,006	4.30
Basic Orange 2	291	303	844	2.79
All other basic orange dyes	441	396	2,162	5.45
Basic red dyes, total	1,748	1,690	8,937	5.25
Basic Red 15	416	406	1,439	3.55
All other basic red dyes	1,332	1,284	7,498	5.84
Basic violet dyes, total	3,597	3,237	13,601	4.20
Basic Violet 1	1,403	1,228	3,389	2.76
Basic Violet 3	1,436	1,289	4,991	3.87
Basic Violet 16	255	303	1,695	5.60
All other basic violet dyes	503	417	3,526	8.46

See footnotes at end of table.

Table 12—Continued

Dyes: U.S. production and sales, 1988

Dyes	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Basic dyes (classical and modified)—Continued				
Basic blue dyes	2,062	1,970	14,026	\$7.12
All other basic dyes	1,808	1,469	18,951	12.91
Direct dyes				
Total	41,616	40,053	98,134	2.45
Direct yellow dyes, total	16,616	16,168	34,034	2.11
Direct Yellow 127	1,155	934	2,243	2.40
All other direct yellow dyes	15,461	15,234	31,791	2.09
Direct orange dyes	1,894	1,342	3,201	2.39
Direct red dyes, total	7,738	5,950	20,622	3.47
Direct Red 83	39	40	205	5.10
Direct Red 254	2,279	1,190	3,003	2.52
All other direct red dyes	5,420	4,720	17,414	3.69
Direct violet and green dyes	218	148	740	5.00
Direct blue dyes, total	7,733	9,067	22,766	2.51
Direct Blue 80	301	335	1,635	4.88
Direct Blue 86	673	650	1,776	2.73
Direct Blue 98	247	235	938	4.00
All other direct blue dyes	6,512	7,847	18,417	2.35
Direct brown dyes	248	254	584	2.30
Direct black dyes	7,169	7,124	16,187	2.27
Disperse dyes				
Total	30,064	21,874	99,689	4.56
Disperse yellow dyes	2,252	1,827	8,133	4.45
Disperse orange dyes, total	5,601	3,363	9,938	2.96
Disperse Orange 25 and 25:1	275	251	720	2.86
All other disperse orange dyes	5,326	3,112	9,218	2.96
Disperse red dyes, total	5,477	4,232	25,877	6.11
Disperse Red 73	582	434	1,585	3.66
Disperse Red 177	313	296	1,512	5.10
All other disperse red dyes	4,582	3,502	22,780	6.50
Disperse violet dyes	356	249	2,206	8.86
Disperse blue dyes	13,637	10,245	43,960	4.29
Disperse black, brown and green dyes, total	2,741	1,958	9,575	4.89
Disperse Brown 1	699	705	2,375	3.37
All other disperse black, brown, and green dyes	2,042	1,253	7,200	5.75

See footnotes at end of table.

Section 4

Table 12—Continued

Dyes: U.S. production and sales, 1988

Dyes	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Fiber-reactive dyes				
Total	19,235	18,669	107,589	\$5.76
Fluorescent brightening agents				
Total	77,381	69,813	102,062	1.46
Food, drug, and cosmetic colors				
Total	6,973	6,625	51,017	7.70
Food, drug and cosmetic dyes, total	6,606	6,307	46,239	7.33
FD&C Red No. 3	303	326	4,649	14.26
FD&C Yellow No. 6	1,637	1,499	6,804	4.54
All other food, drug, and cosmetic, dyes	4,666	4,482	34,786	7.76
Drug and cosmetic dyes, total ²	367	318	4,778	14.65
Mordant dyes				
Total	56	39	178	4.56
Solvent dyes				
Total	12,448	8,921	43,012	4.82
Solvent yellow dyes	1,583	1,423	9,491	6.67
Solvent orange dyes	504	476	3,313	6.96
Solvent red dyes	3,384	3,356	14,818	4.42
Solvent blue dyes	3,534	1,080	7,400	6.85
All other solvent dye	3,443	2,586	7,990	3.09
Vat dyes				
Total	30,966	30,355	58,648	1.93
Vat orange dyes	100	108	708	6.56
Vat red dyes	280	248	2,115	8.53
Vat violet dyes	232	183	1,361	7.44
Vat blue dyes	29,370	28,941	50,211	1.73
Vat green dyes	403	268	1,100	4.10
Vat brown dyes	312	324	1,852	5.72
Vat black dyes	269	283	1,301	4.60
All other dyes				
Total ³	30,023	26,526	57,906	2.18

¹ Calculated from unrounded figures.

² The data include external drug and cosmetic dyes.

³ The data include azolic compositions, azolic coupling components, azolic diazo components (bases and salts), sulfur dyes, and miscellaneous dyes. Statistics for those groups of dyes may not be published separately because publication would disclose information received in confidence.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 13

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Acid dyes	Yes	
Acid yellow dyes:	Yes	
Acid Yellow 3	No	ACY.
Acid Yellow 17	Yes	ATL, CK, HIL.
Acid Yellow 23	Yes	BAS, CK, HIL, LVR, WJ.
Acid Yellow 34	No	ATL.
Acid Yellow 36	No	ATL.
Acid Yellow 49	No	ATL, CK.
Acid Yellow 59	No	BAS.
Acid Yellow 65	No	ATL.
Acid Yellow 73	No	HIL.
Acid Yellow 87	No	CK.
Acid Yellow 99	No	CK.
Acid Yellow 127	No	CK.
Acid Yellow 129	No	CK.
Acid Yellow 135	No	ICI.
Acid Yellow 151	No	CGY, CK.
Acid Yellow 159	No	CK.
Acid Yellow 174	No	FAB.
Acid Yellow 198	No	CK.
Acid Yellow 200	No	CK.
Acid Yellow 219	No	CGY, CK.
Acid Yellow 226	No	BAS.
Acid Yellow 239	No	DGO.
All other acid yellow dyes	No	CK.
Acid orange dyes:	Yes	
Acid Orange 7	No	BAS, CK.
Acid Orange 8	Yes	ATL, BAS, CK.
Acid Orange 10	No	ATL, CK.
Acid Orange 24	No	CK, FAB, S.
Acid Orange 60	No	CGY, CK.
Acid Orange 64	No	ATL.
Acid Orange 89	No	BAS.
Acid Orange 116	No	CGY, CK.
Acid Orange 128	No	CK.
Acid Orange 152	No	CK.
Acid Orange 156	No	CGY, CK, S.
Acid Orange 161	No	ATL.
Acid red dyes:	Yes	
Acid Red 1	Yes	ATL, BAS, CGY, CK.
Acid Red 4	No	ATL.
Acid Red 14	No	ATL, BAS.
Acid Red 18	No	ATL.
Acid Red 57	No	CK.
Acid Red 73	No	ATL, CK, PSC, S.
Acid Red 85	No	FAB.
Acid Red 87	No	HIL.
Acid Red 88	No	ATL.
Acid Red 97	No	ATL.
Acid Red 114	No	CGY.
Acid Red 119	No	CK.
Acid Red 137	Yes	ATL, BAS, CK, LVR.
Acid Red 151	No	ATL, CK.
Acid Red 174	No	CGY.
Acid Red 182	Yes	CGY, CK, VPC.
Acid Red 186	No	CGY.
Acid Red 226	No	BAS.
Acid Red 266	No	CK.
Acid Red 296	No	BAS.
Acid Red 299	No	CK.

See footnotes at end of table.

Section 4

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Acid dyes—Continued		
Acid red dyes—Continued		
Acid Red 337	No	ATL, CK.
Acid Red 364	No	CK.
Acid Red 384	No	CK.
Acid Red 388	No	CK.
Acid Red 396	No	ICI.
Acid Red 410	No	ATL.
All other acid red dyes	No	ATL, BAS, CGY, CK.
Acid violet dyes:	Yes	
Acid Violet 3	No	ATL, FAB.
Acid Violet 7	No	ATL, FAB.
Acid Violet 12	No	ATL, FAB.
Acid Violet 17	No	HIL.
Acid Violet 49	No	HIL.
Acid blue dyes:	Yes	
Acid Blue 9	No	BAS, HIL, LVR, WJ.
Acid Blue 15	No	BAS.
Acid Blue 25	No	VPC.
Acid Blue 40	No	ATL, CK, VPC.
Acid Blue 41	No	ATL, CK.
Acid Blue 67	No	BAS.
Acid Blue 92	No	FAB.
Acid Blue 113	No	CK.
Acid Blue 118	No	ATL.
Acid Blue 145	No	ATL, CK.
Acid Blue 231	No	CK.
Acid Blue 283	No	S.
Acid Blue 298	No	CK.
Acid Blue 321	No	ATL.
Acid Blue 324	Yes	CK, S, VPC.
Acid Blue 330	No	ATL.
All other acid blue dyes	No	CK.
Acid green dyes:	Yes	
Acid Green 1	No	LVR.
Acid Green 5	No	WJ.
Acid Green 9	No	LVR.
Acid Green 20	No	ATL.
Acid Green 25	No	ATL, CK.
All other acid green dyes	No	FAB.
Acid brown dyes:	Yes	
Acid Brown 14	No	CK, LVR, S.
Acid Brown 19	No	CK.
Acid Brown 50	No	BAS.
Acid Brown 96	No	FAB.
Acid Brown 97	No	BAS, FAB.
Acid Brown 98	No	FAB.
Acid Brown 147	No	CK.
Acid Brown 159	No	BAS, FAB.
Acid Brown 160	No	BAS.
Acid Brown 161	No	BAS.
Acid Brown 165	No	BAS.
Acid Brown 188	No	CK.
Acid Brown 189	No	CK.
Acid Brown 227	No	BAS.
Acid Brown 239	No	CK.
Acid Brown 264	No	BAS.
Acid Brown 439	No	CK.
All other acid brown dyes	No	BAS, FAB.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Acid dyes—Continued		
Acid black dyes:	Yes	
Acid Black 1	No	CK.
Acid Black 2	No	ATL, LVR.
Acid Black 52	No	ATL, CK, S.
Acid Black 60	No	CK.
Acid Black 63	No	BAS.
Acid Black 107	No	CK.
Acid Black 172	No	ICI.
Acid Black 194	No	BAS.
Acid Black 210	No	BAS.
All other acid black dyes	No	BAS, CK.
Azolic dyes and components:	No	
Azolic compositions:	No	
Azolic yellow compositions:	No	
Azolic Yellow 1	No	BUC.
Azolic orange compositions:	No	
Azolic Orange 3	No	BUC.
Azolic red compositions:	No	
Azolic Red 1	No	BUC.
Azolic Red 2	No	BUC.
Azolic Red 6	No	BUC.
All other azolic red compositions	No	ALL, BUC.
Azolic violet compositions:	No	
Azolic Violet 1	No	BUC.
All other azolic violet compositions	No	BUC.
Azolic blue compositions:	No	
Azolic Blue 3	No	BUC.
All other azolic blue compositions	No	BUC.
Azolic brown compositions:	No	
Azolic Brown 9	No	BUC.
All other azolic brown compositions	No	BUC.
Azolic black compositions:	No	
Azolic Black 4	No	BUC.
All other azolic black compositions	No	BUC.
Azolic diazo components, bases:	No	
Azolic Diazo Component 5, base	No	ALL.
Azolic Diazo Component 13, base	No	ALL.
Azolic Diazo Component 32, base	No	ALL.
All other azolic diazo components, base	No	ALL.
Azolic diazo components, salts:	No	
Azolic Diazo Component 1, salt	No	ALL, BUC.
Azolic Diazo Component 3, salt	No	ALL, BUC.
Azolic Diazo Component 5, salt	No	ALL.
Azolic Diazo Component 8, salt	No	ALL, BUC.
Azolic Diazo Component 9, salt	No	ALL, BUC.
Azolic Diazo Component 10, salt	No	ALL, BUC.
Azolic Diazo Component 11, salt	No	ALL.
Azolic Diazo Component 12, salt	No	ALL, BUC.
Azolic Diazo Component 13, salt	No	ALL, BUC.
Azolic Diazo Component 14, salt	No	ALL.
Azolic Diazo Component 20, salt	No	ATL.
Azolic Diazo Component 32, salt	No	ATL.
Azolic Diazo Component 34, salt	No	ALL.
Azolic Diazo Component 35, salt	No	ALL.
Azolic Diazo Component 41, salt	No	ALL.
Azolic Diazo Component 42, salt	No	ALL.
Azolic Diazo Component 44, salt	No	ALL.

See footnotes at end of table.

Section 4

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Azolic dyes and components—Continued		
Azolic diazo components, salts—Continued		
Azolic Diazo Component 48, salt	No	ATL.
Azolic Diazo Component 49, salt	No	ALL.
All other azolic diazo components, salt	No	ALL.
Azolic coupling components:		
Azolic Coupling Component 2	No	ALL.
Azolic Coupling Component 3	No	PCW.
Azolic Coupling Component 4	No	ALL.
Azolic Coupling Component 7	No	PCW.
Azolic Coupling Component 12	No	ALL, PCW.
Azolic Coupling Component 14	No	ALL.
Azolic Coupling Component 17	No	ALL.
Azolic Coupling Component 18	No	ALL.
Azolic Coupling Component 20	No	PCW.
Azolic Coupling Component 21	No	PCW.
Azolic Coupling Component 29	No	PCW.
Azolic Coupling Component 34	No	ALL.
Azolic Coupling Component 43	No	ALL.
Basic dyes (classical and modified)	Yes	
Basic yellow dyes:		
Basic Yellow 2	No	ACY.
Basic Yellow 11	Yes	ATL, CK, VPC.
Basic Yellow 13	No	ATL.
Basic Yellow 15	No	CK.
Basic Yellow 24	No	BAS.
Basic Yellow 25	No	BAS.
Basic Yellow 28	No	BAS, VPC.
Basic Yellow 29	No	BAS.
Basic Yellow 37	No	ACY.
Basic Yellow 53	No	CK.
Basic Yellow 58	No	VPC.
Basic Yellow 65	No	BAS.
Basic Yellow 79	No	CK.
Basic Yellow 83	No	CK.
Basic Yellow 94	No	S.
Basic Yellow 96	No	BAS.
Basic Yellow 98	No	BAS.
Basic Yellow 102	No	BAS.
All other basic yellow dyes	No	ACY, (²).
All other, modified basic yellow dyes	No	CK.
Basic orange dyes:		
Basic Orange 1	No	ATL, BAS, CK, PSC.
Basic Orange 2	Yes	ACY, ATL, CK, PSC.
Basic Orange 21	No	ATL, VPC.
Basic Orange 26	No	CK.
All other basic orange dyes	No	(²).
Basic red dyes:		
Basic Red 12	Yes	ACY, ATL, VPC.
Basic Red 14	No	BAS, CK.
Basic Red 15	Yes	ATL, BAS, CK.
Basic Red 17	No	CK.
Basic Red 22	No	CK.
Basic Red 29	No	BAS.
Basic Red 46	No	CK.
Basic Red 49	No	BAS.
Basic Red 54	No	BAS.
Basic Red 73	No	CK.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Basic dyes (classical and modified)—Continued		
Basic red dyes—Continued		
Basic Red 104	No	CK.
Basic Red 111	No	S.
All other basic red dyes	No	(²).
Basic violet dyes:		
Basic Violet 1	Yes	ACY, BAS, DSC.
Basic Violet 3	Yes	ACY, BAS, CK, DSC.
Basic Violet 4	No	ACY, DSC.
Basic Violet 10	No	ACY, BAS.
Basic Violet 16	Yes	ATL, CK, VPC.
Basic Violet 35	No	BAS.
All other basic violet dyes	No	BAS, (²).
Basic blue dyes:		
Basic Blue 1	No	ACY.
Basic Blue 3	No	BAS, CK.
Basic Blue 7	No	DSC.
Basic Blue 21	No	CK.
Basic Blue 41	No	BAS.
Basic Blue 54	No	BAS.
Basic Blue 60	No	BAS.
Basic Blue 77	No	CK.
Basic Blue 94 and 94:1	No	CK.
Basic Blue 140	No	VPC.
Basic Blue 152	No	BAS.
All other basic blue dyes	No	BAS, (²).
All other, modified basic blue dyes	No	CK, VPC.
Basic green dyes:		
Basic Green 4	No	ACY, BAS.
All other basic green dyes	No	(²).
Basic brown dyes:		
Basic Brown 1	No	PSC.
Basic Brown 4	No	ACY, BAS, FAB, PSC.
All other basic brown dyes	No	BAS.
Basic black dyes:		
All other basic black dyes	No	ACY, BAS, (²).
All other, modified basic black dyes	No	BAS, CK, VPC.
Direct dyes	Yes	
Direct yellow dyes:		
Direct Yellow 4	No	ATL, BAS, CGY, CK, LVR, VPC.
Direct Yellow 5	No	BAS.
Direct Yellow 6	No	CGY, VPC.
Direct Yellow 11	No	BAS, VPC.
Direct Yellow 28	No	ATL, CK.
Direct Yellow 34	No	CK.
Direct Yellow 44	No	CK.
Direct Yellow 51	No	S.
Direct Yellow 105	No	CGY, CK.
Direct Yellow 106	No	CK.
Direct Yellow 107	No	CK.
Direct Yellow 118	No	CK.
Direct Yellow 119	No	VPC.
Direct Yellow 127	Yes	BAS, CGY, CK, VPC.
Direct Yellow 131	No	VPC.
Direct Yellow 132	No	S.
Direct Yellow 133	No	S.
Direct Yellow 137	No	VPC.
Direct Yellow 147	No	BAS, VPC.

See footnotes at end of table.

Section 4

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Direct dyes—Continued		
Direct yellow dyes—Continued		
Direct Yellow 148	No	S.
Direct Yellow 154	No	VPC.
All other direct yellow dyes	No	ATL, BAS, CK, VPC.
Direct orange dyes:		
Direct Orange 6	No	ATL.
Direct Orange 8	No	FAB.
Direct Orange 15	No	BAS, CGY, VPC.
Direct Orange 26	No	CK.
Direct Orange 34	No	ATL.
Direct Orange 39	No	CK, FAB, VPC.
Direct Orange 72	No	CK.
Direct Orange 80	No	ATL.
Direct Orange 102	No	ATL, BAS, CGY, VPC.
Direct Orange 118	No	S.
All other direct orange dyes	No	BAS.
Direct red dyes:		
Direct Red 2	No	ATL.
Direct Red 4	No	CK.
Direct Red 9	No	CK.
Direct Red 16	No	ATL.
Direct Red 23	No	ATL.
Direct Red 24	No	ATL.
Direct Red 26	No	ATL.
Direct Red 72	No	CGY, CK.
Direct Red 73	No	ATL.
Direct Red 80	No	ATL, CK, VPC.
Direct Red 81	No	ATL, CK, FAB, LVR, VPC.
Direct Red 83	Yes	ATL, CK, FAB.
Direct Red 236	No	BAS, CGY, VPC.
Direct Red 238	No	VPC.
Direct Red 239	No	BAS, CK, S.
Direct Red 254	Yes	BAS, CGY, VPC.
All other direct red dyes	No	ACY, ATL, BAS, CK, VPC.
Direct violet dyes:		
Direct Violet 9	No	ATL.
Direct Violet 66	No	ATL.
Direct Violet 99	No	VPC.
Direct blue dyes:		
Direct Blue 15	No	VPC.
Direct Blue 22	No	CGY.
Direct Blue 25	No	ATL.
Direct Blue 75	No	CK, S.
Direct Blue 76	No	CK.
Direct Blue 80	Yes	ATL, CGY, CK, FAB.
Direct Blue 86	Yes	CGY, CK, S, VPC.
Direct Blue 98	Yes	ATL, CK, FAB.
Direct Blue 100	No	FAB.
Direct Blue 108	No	ATL.
Direct Blue 160	No	CK.
Direct Blue 189	No	CK.
Direct Blue 191	No	CK.
Direct Blue 199	No	BAS, VPC.
Direct Blue 218	No	ATL, CK, FAB, VPC.
Direct Blue 269	No	VPC.
Direct Blue 279	No	VPC.
Direct Blue 281	No	CGY.
Direct Blue 283	No	ATL.
Direct Blue 286	No	ATL.
All other direct blue dyes	No	ATL, BAS, CK, FAB, VPC.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Direct dyes—Continued		
Direct green dyes:	No	
Direct Green 92	No	ATL.
All other direct green dyes	No	FAB.
Direct brown dyes:	No	
Direct Brown 44	No	FAB.
Direct Brown 231	No	ATL.
Direct Brown 232	No	ATL.
Direct Brown 238	No	ATL.
All other direct brown dyes	No	ATL, BAS, CK, FAB, VPC.
Direct black dyes:	No	
Direct Black 22	No	ATL, CK.
Direct Black 80	No	ATL, CK.
Direct black 163	No	S.
Direct Black 165	No	ATL.
Direct Black 170	No	ATL.
All other direct black dyes	No	ATL, BAS, CK, FAB, VPC.
Disperse dyes	Yes	
Disperse yellow dyes:	Yes	
Disperse Yellow 3	No	CK.
Disperse Yellow 23	No	ATL, CK.
Disperse Yellow 34	No	EKT.
Disperse Yellow 42	No	CGY, S.
Disperse Yellow 54	No	BAS.
Disperse Yellow 64	No	BAS, HCL.
Disperse Yellow 77	No	VPC.
Disperse Yellow 86	No	EKT.
Disperse Yellow 88	No	EKT.
Disperse Yellow 108	No	EKT.
Disperse Yellow 114	No	HCL.
Disperse Yellow 126	No	ICI.
Disperse Yellow 198	No	BAS.
Disperse Yellow 219	No	S.
Disperse Yellow 238	No	CK.
Disperse Yellow 239	No	CK.
All other disperse yellow dyes	No	BAS, ICI, VPC.
Disperse orange dyes:	Yes	
Disperse Orange 3	No	ATL, CK.
Disperse Orange 17	No	ATL.
Disperse Orange 25 and 25:1	Yes	ATL, CGY, CK, ICI, VPC.
Disperse Orange 29	No	CK.
Disperse Orange 30	No	ATL, CGY, CK, S.
Disperse Orange 33	No	BUC.
Disperse Orange 37	No	ATL, CK, EKT.
Disperse Orange 41	No	CGY, S.
Disperse Orange 44 and 44:1	No	ATL, CGY, CK, S, SDC.
Disperse Orange 73	No	ATL, BAS.
Disperse Orange 89	No	CK.
Disperse Orange 94	No	S.
Disperse Orange 136	No	EKT.
Disperse Orange 138	No	EKT.
Disperse Orange 145	No	EKT.
All other disperse orange dyes	No	CK.
Disperse red dyes:	Yes	
Disperse Red 1	No	ATL, CK.
Disperse Red 5	No	ATL, CK.
Disperse Red 13	No	ATL.
Disperse Red 17	No	ATL, CK.

See footnotes at end of table.

Section 4

Table 13—Continued
 Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 14)
Disperse dyes—Continued		
Disperse red dyes—Continued		
Disperse Red 30	No	EKT.
Disperse Red 50	No	CK.
Disperse Red 55	No	BAS.
Disperse Red 60	No	BAS.
Disperse Red 65	No	CK.
Disperse Red 73	Yes	ATL, CK, ICI, S.
Disperse Red 74	No	S.
Disperse Red 91	No	BAS.
Disperse Red 135	No	CK.
Disperse Red 145	No	CK.
Disperse Red 153	No	CK, S.
Disperse Red 159	No	VPC.
Disperse Red 167 and 167:1	No	ATL, CGY, CK, S.
Disperse Red 177	Yes	CK, ICI, S.
Disperse Red 179	No	BAS, S.
Disperse Red 195	No	S.
Disperse Red 263	No	BAS, S.
Disperse Red 274	No	S.
Disperse Red 278	No	ICI.
Disperse Red 305	No	EKT.
Disperse Red 307	No	EKT.
Disperse Red 309	No	EKT.
Disperse Red 311	No	ICI.
Disperse Red 313	No	S.
Disperse Red 316	No	S.
Disperse Red 325	No	CK.
Disperse Red 333	No	S.
Disperse Red 338	No	EKT.
Disperse Red 339	No	EKT.
Disperse Red 340	No	EKT.
Disperse Red 341	No	EKT.
Disperse Red 345	No	CK.
Disperse Red 358	No	HCL.
All other disperse red dyes	No	CK.
Disperse violet dyes:	Yes	
Disperse Violet 1	No	ATL, CK.
Disperse Violet 17	No	CK.
Disperse Violet 28	No	CK.
Disperse Violet 33	No	ICI, S.
Disperse Violet 36	No	S.
Disperse Violet 48	No	HCL.
Disperse Violet 60	No	S.
Disperse Violet 91	No	CGY.
Disperse blue dyes:	Yes	
Disperse Blue 3	No	CK, EKT, FAB.
Disperse Blue 27	No	EKT.
Disperse Blue 56	No	S.
Disperse Blue 60	No	BAS.
Disperse Blue 62	No	EKT.
Disperse Blue 64	No	EKT.
Disperse Blue 73	No	S.
Disperse Blue 79	No	BAS, BUC, CGY, EKT, HCL, ICI, S.
Disperse Blue 95	No	HCL.
Disperse Blue 102	No	CK, EKT.
Disperse Blue 118	No	EKT.
Disperse Blue 122	No	ICI.
Disperse Blue 148	No	BAS.
Disperse Blue 183	No	ATL.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 14)
Disperse dyes—Continued		
Disperse blue dyes—Continued		
Disperse Blue 200	No	ICI.
Disperse Blue 281	No	S.
Disperse Blue 284	No	ICI.
Disperse Blue 291	No	S.
Disperse Blue 333	No	HCL.
Disperse Blue 337	No	EKT.
Disperse Blue 338	No	EKT.
Disperse Blue 359	No	CK.
Disperse Blue 360	No	CK.
All other disperse blue dyes	No	ATL, BAS, BUC, CK, HCL, ICI.
Disperse green dyes:		
Disperse Green 9	No	ICI.
Disperse brown dyes:		
Disperse Brown 1	Yes	ATL, BUC, CK, ICI, S.
Disperse Brown 18	No	S.
Disperse Brown 22	No	EKT.
Disperse Brown 26	No	CK.
Disperse Brown 27	No	CK.
Disperse black dyes:		
Disperse Black 9	No	ATL, EKT.
Disperse Black 33	No	CGY.
All other disperse black dyes	No	BAS, CK, HCL.
Fiber-reactive dyes	Yes	
Reactive yellow dyes:		
Reactive Yellow 7	No	ICI.
Reactive Yellow 15	No	HCL.
Reactive Yellow 17	No	HCL.
Reactive Yellow 18	No	ICI.
Reactive Yellow 22	No	ICI.
Reactive Yellow 37	No	HCL.
Reactive Yellow 42	No	HCL.
Reactive Yellow 86	No	ICI.
Reactive Yellow 125	No	S.
Reactive Yellow 133	No	ICI.
Reactive Yellow 135	No	ICI.
Reactive Yellow 160	No	HCL.
All other reactive yellow dyes	No	HCL, ICI.
Reactive orange dyes:		
Reactive Orange 1	No	ICI.
Reactive Orange 4	No	ICI.
Reactive Orange 12	No	ICI.
Reactive Orange 13	No	ICI.
Reactive Orange 14	No	ICI.
Reactive Orange 16	No	ATL, CK, HCL.
Reactive Orange 20	No	CK.
Reactive Orange 78	No	HCL.
Reactive Orange 84	No	ICI.
Reactive Orange 86	No	CK, ICI.
All other reactive orange dyes	No	HCL.
Reactive red dyes:		
Reactive Red 2	No	CK, ICI.
Reactive Red 8	No	ICI.
Reactive Red 11	No	ICI.
Reactive Red 21	No	HCL.
Reactive Red 29	No	ICI.
Reactive Red 31	No	ICI.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Fiber-reactive dyes—Continued		
Reactive red dyes—Continued		
Reactive Red 33	No	ICI.
Reactive Red 35	No	HCL.
Reactive Red 43	No	CK, ICI.
Reactive Red 49	No	HCL.
Reactive Red 94	No	HCL.
Reactive Red 120	No	BAS, CK, ICI.
Reactive Red 141	No	ICI.
Reactive Red 147	No	S.
Reactive Red 180	No	ATL, HCL.
All other reactive red dyes	No	ATL, CK, HCL, ICI.
Reactive violet dyes:		
Reactive Violet 1	No	ICI.
Reactive Violet 5	No	HCL.
All other reactive violet dyes	No	HCL, ICI.
Reactive blue dyes:		
Reactive Blue 3	No	ICI.
Reactive Blue 4	No	CK, ICI.
Reactive Blue 5	No	ICI.
Reactive Blue 13	No	ICI.
Reactive Blue 19	No	HCL.
Reactive Blue 21	No	HCL.
Reactive Blue 38	No	HCL.
Reactive Blue 41	No	S.
Reactive Blue 71	No	ICI.
Reactive blue 79	No	S.
Reactive Blue 89	No	HCL, ICI.
Reactive Blue 173	No	ICI.
Reactive Blue 174	No	ICI.
Reactive Blue 199	No	ICI.
Reactive Blue 203	No	HCL.
All other reactive blue dyes	No	HCL, ICI.
Reactive green dyes:		
Reactive Green 19	No	ICI.
Reactive brown dyes:		
Reactive Brown 1	No	ICI.
Reactive Brown 17	No	ICI.
Reactive Brown 18	No	HCL.
Reactive black dyes:		
Reactive Black 5	No	ATL, CK, HCL.
Reactive Black 9	No	ICI.
All other reactive black dyes	No	HCL.
Fluorescent brighteners		
	Yes	
Fluorescent Brightener 22	No	CGY.
Fluorescent Brightener 28	No	CGY, VPC.
Fluorescent Brightener 46	No	CGY.
Fluorescent Brightener 49	No	S.
Fluorescent Brightener 52	No	S.
Fluorescent Brightener 61	No	ACY.
Fluorescent Brightener 71	No	CGY.
Fluorescent Brightener 102	No	CGY.
Fluorescent Brightener 114	No	VPC.
Fluorescent Brightener 128	No	HIL.
Fluorescent Brightener 134	No	CGY.
Fluorescent Brightener 191	No	VPC.
Fluorescent Brightener 205	No	VPC.
Fluorescent Brightener 290	No	S.
All other fluorescent brighteners	No	ACY, CGY, S, VPC, (2).

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Food, drug, and cosmetic colors	Yes	
Food, drug, and cosmetic dyes:	Yes	
Food, Drug, and Cosmetic Blue 1	No	HIL, WJ.
Food, Drug, and Cosmetic Blue 2	No	HIL, WJ.
Food, Drug, and Cosmetic Green 3	Yes	WJ.
Food, Drug, and Cosmetic Red 3	No	HIL, STG, WJ.
Food, Drug, and Cosmetic Red 4	No	CK, WJ.
Food, Drug, and Cosmetic Red 40	No	HIL, STG, WJ.
Food, Drug, and Cosmetic Yellow 5	No	CK, HIL, STG, WJ.
Food, Drug, and Cosmetic Yellow 6	Yes	CK, HIL, STG, WJ.
Drug and cosmetic dyes:	Yes	
Drug and Cosmetic Green 5	No	CK, WJ.
Drug and Cosmetic Green 6	No	WJ.
Drug and Cosmetic Green 8	No	HIL, WJ.
Drug and Cosmetic Orange 4	No	CK, WJ.
Drug and Cosmetic Orange 5	No	SNA.
Drug and Cosmetic Orange 17	No	SNA.
Drug and Cosmetic Red 6	No	HIL, SNA, WJ.
Drug and Cosmetic Red 7	No	HIL, MRX, SNA, WJ.
Drug and Cosmetic Red 9	No	SNA.
Drug and Cosmetic Red 17	No	WJ.
Drug and Cosmetic Red 19	No	SNA.
Drug and Cosmetic Red 21	No	SNA.
Drug and Cosmetic Red 27	No	HIL, MRX, SNA.
Drug and Cosmetic Red 30	No	MRX, SNA, WJ.
Drug and Cosmetic Red 33	No	CK, SNA, WJ.
Drug and Cosmetic Red 34	No	SNA.
Drug and Cosmetic Red 36	No	WJ.
Drug and Cosmetic Violet 2	No	WJ.
Drug and Cosmetic Yellow 7	No	WJ.
Drug and Cosmetic Yellow 10	No	CK, HIL, WJ.
Drug and cosmetic dyes, external:	Yes	
External Drug and Cosmetic Orange 3	No	CK, WJ.
External Drug and Cosmetic Yellow 7	No	WJ.
Mordant dyes	Yes	
Mordant yellow dyes:	No	
Mordant Yellow 1	No	FAB.
Mordant orange dyes:	No	
Mordant Orange 1	No	FAB.
Mordant Orange 6	No	ATL, FAB.
Mordant red dyes:	No	
Mordant Red 7	No	ATL.
Mordant brown dyes:	No	
Mordant Brown 1	No	FAB.
Mordant Brown 18	No	FAB.
Mordant Brown 33	No	FAB.
Mordant Brown 70	No	FAB.
Solvent dyes	Yes	
Solvent yellow dyes:	Yes	
Solvent Yellow 3	No	PSC.
Solvent Yellow 13	No	BAS, FAB.
Solvent Yellow 14	No	ATL, PSC.
Solvent Yellow 16	No	PSC.
Solvent Yellow 18	No	ATL.
Solvent Yellow 33	No	ACY, CIC.
Solvent Yellow 40	No	CK.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Solvent dyes—Continued		
Solvent yellow dyes—Continued		
Solvent Yellow 42	No	ATL, CK.
Solvent Yellow 43	No	DGO.
Solvent Yellow 56	No	PSC.
Solvent Yellow 72	No	CIC, PSC.
Solvent Yellow 94	No	HIL.
Solvent Yellow 107	No	MRT.
Solvent Yellow 131	No	DGO.
Solvent Yellow 135	No	DGO.
Solvent Yellow 143	No	MRT.
Solvent Yellow 160	No	DGO.
Solvent Yellow 161	No	MRT.
All other solvent yellow dyes	No	ATL, CIC, FAB, MIL, MRT.
Solvent orange dyes:	Yes	
Solvent Orange 2	No	PSC.
Solvent Orange 3	No	ACY, PSC.
Solvent Orange 7	No	ATL, PSC.
Solvent Orange 20	No	BAS, FAB.
Solvent Orange 23	No	ATL, CK.
Solvent Orange 25	No	ATL, MRT.
Solvent Orange 31	No	PSC.
Solvent Orange 60	No	CIC.
Solvent Orange 77	No	MRT.
Solvent Orange 97	No	MRT.
All other solvent orange dyes	No	MRT.
Solvent red dyes:	Yes	
Solvent Red 1	No	PSC.
Solvent Red 23	No	PSC.
Solvent Red 24	No	ATL, PSC.
Solvent Red 26	No	PSC.
Solvent Red 27	No	PSC.
Solvent Red 42	No	HIL.
Solvent Red 49	No	ACY, BAS.
Solvent Red 68	No	ATL, CK, MRT.
Solvent Red 74	No	ATL.
Solvent Red 111	No	MRT.
Solvent Red 164	No	MRT.
Solvent Red 166	No	MRT.
Solvent Red 168	No	MRT.
Solvent Red 169	No	MRT.
Solvent Red 172	No	MRT.
Solvent Red 175	No	MRT.
Solvent Red 207	No	MRT.
Solvent Red 208	No	MRT.
Solvent Red 222	No	CIC.
All other solvent red dyes	No	ATL, CIC, MIL, PSC.
Solvent violet dyes:	No	
Solvent Violet 8	No	BAS, DSC.
Solvent Violet 9	No	DSC.
Solvent Violet 13	No	CK.
Solvent Violet 14	No	MRT.
Solvent Violet 38	No	MRT.
All other solvent violet dyes	No	CK, MIL.
Solvent blue dyes:	Yes	
Solvent Blue 3	No	PSG.
Solvent Blue 4	No	BAS.
Solvent Blue 5	No	DSC.
Solvent Blue 35	No	MRT.
Solvent Blue 36	No	MRT.
Solvent Blue 38	No	TNI.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Solvent dyes—Continued		
Solvent blue dyes—Continued		
Solvent Blue 58	No	VPC.
Solvent Blue 59	No	MRT, VPC.
Solvent Blue 60	No	ATL.
Solvent Blue 98	No	MRT.
Solvent Blue 99	No	MRT.
Solvent Blue 100	No	MRT.
Solvent Blue 101	No	MRT.
Solvent Blue 102	No	MRT.
Solvent Blue 128	No	MRT.
Solvent Blue 129	No	MRT.
All other solvent blue dyes	No	BAS, CK, MIL.
Solvent green dyes:		
Solvent Green 3	No	ACY, MRT.
Solvent brown dyes:		
Solvent Brown 12	No	PSC.
Solvent Brown 20	No	ATL.
Solvent Brown 22	No	PSC.
Solvent Brown 38	No	FAB.
Solvent Brown 52	No	MRT.
Solvent black dyes:		
Solvent Black 5	No	LVR.
Solvent Black 7	No	BAS, OCC, PSC.
Solvent Black 13	No	ATL, CK.
Solvent Black 26	No	ATL.
Solvent Black 46	No	MRT.
Solvent Black 47	No	MRT.
Solvent Black 49	No	MRT.
Sulfur dyes	No	
Sulfur yellow dyes:		
Leuco Sulfur Yellow 22	No	SDC.
All other sulfur yellow dyes	No	SDC.
Sulfur orange dyes:		
All other sulfur orange dyes	No	SDC.
Sulfur red dyes:		
Leuco Sulfur Red 14	No	SDC.
Sulfur Red 10	No	SDC.
Sulfur blue dyes:		
Leuco Sulfur Blue 7	No	SDC.
Leuco Sulfur Blue 11	No	SDC.
Leuco Sulfur Blue 13	No	S.
Sulfur green dyes:		
Leuco Sulfur Green 3	No	SDC.
Leuco Sulfur Green 16	No	SDC.
Leuco Sulfur Green 34	No	SDC.
Leuco Sulfur Green 35	No	SDC.
Leuco Sulfur Green 36	No	SDC.
Sulfur brown dyes:		
Leuco Sulfur Brown 1, 1:1	No	SDC.
Leuco Sulfur Brown 3	No	SDC.
Leuco Sulfur Brown 10	No	SDC.
Leuco Sulfur Brown 37	No	SDC.
Leuco Sulfur Brown 52	No	SDC.
Sulfur black dyes:		
Leuco Sulfur Black 1	No	BRR, SDC.
Leuco Sulfur Black 2	No	S, SDC.
Leuco Sulfur Black 18	No	SDC.

See footnotes at end of table.

Section 4

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14)
Sulfur dyes—Continued		
Solubilized Sulfur Black 1	No	S.
Solubilized Sulfur Black 2	No	SDC.
Sulfur Black 11, 11:1	No	SDC.
Vat dyes	Yes	
Vat orange dyes:	Yes	
Vat Orange 2, 12%	No	BAS.
Vat Orange 7, 11%	No	HCL.
Vat red dyes:	Yes	
Vat Red 10, 18%	No	BAS.
Vat Red 15, 10%	No	HCL.
All other vat red dyes	No	HCL.
Vat violet dyes:	Yes	
Vat Violet 1, 11%	No	BRR.
Vat Violet 13, 6-1/4%	No	BAS.
Vat blue dyes:	Yes	
Vat Blue 1, 20%	No	BCC, PSC.
Vat Blue 6, 8-1/3%	No	BAS.
Vat Blue 16, 16%	No	BAS.
Vat Blue 19	No	BAS.
Vat Blue 20, 14%	No	BRR.
Vat Blue 29	No	BAS.
Vat Blue 43	No	SDC.
Vat Blue 66	No	BAS.
Vat green dyes:	Yes	
Vat Green 1, 6%	No	BAS.
Vat Green 3, 10%	No	BAS, BRR.
Vat Green 7	No	SDC.
Vat Green 8, 8-1/2%	No	BRR.
All other vat green dyes	No	HCL.
Vat brown dyes:	Yes	
Vat Brown 1, 11%	No	BRR.
Vat Brown 57, 12.8%	No	HCL.
All other vat brown dyes	No	HCL.
Vat black dyes:	Yes	
Vat Black 16	No	BRR.
Vat Black 25, 12-1/2%	No	BAS, BRR, SDC.
Miscellaneous dyes:	No	
All other dyes	No	DAN, MIL, MRT.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² Reported data are accepted in confidence and may not be published, or no data were reported.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 14

Dyes: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ACY	American Cyanamid Co.	ICI	ICI Americas, Inc., Chemical Div.
ALL	Alliance Chemical, Inc.	LVR	C. Lever Co., Inc.
ATL	Atlantic Industries, Inc.	MIL	Milliken & Co., Milliken Chemical Div.
BAS	BASF Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Div.
BCC	Buffalo Color Corp.	MRX	Max Marx Color Corp.
BRR	Burrill Chemical Inc., Colors Div.	OCC	Orient Chemical Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	PCW	Pfister Chemical, Inc.
CGY	Ciba-Geigy Corp.	PSC	Passaic Color & Chemical Co.
CIC	Color Chem International Corp.	PSG	PMC Specialities Group, Inc.
CK	Crompton & Knowles Corp.	S	Sandoz, Inc.:
DAN	Dan River, Inc., Chemical Products Div.		Colors & Chemicals Div.
DGO	Day-Glo Color Corp.	SDC	Sandoz Chemical Corp.
DSC	Dye Specialties Inc.	SNA	Sun Chemical Corp., Pigments Div.
EKT	Eastman Kodak Co., Tennessee Eastman Co. Div.	STG	McCormick & Co., Inc., McCormick/Strange Flavor Div.
FAB	Fabricolor Manufacturing Corp.	TNI	Gillette Co., Chemical Div.
HCL	Hoechst Celanese Corp.:	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
	Rhode Island Works		
	Sou-Tex Works		
HIL	Hilton Davis Company	WJ	Warner-Jenkinson Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A. Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 5

Organic Pigments

Organic pigments are toners and lakes¹ derived in whole or in part from benzenoid chemicals and colors.

Statistics on production and sales of all organic pigments in 1988 are given in table 15. Individual toners and lakes are identified in this report by the names used in the third edition of the Colour Index.

Total production of organic pigments in 1988 was 115.9 million pounds, 23.4 percent more than the 93.9 million pounds produced in 1987. Total sales of organic pigments in 1988 amounted to 86.9 million pounds, valued at \$594.7 million, compared with 83.3 million pounds, valued at \$586.3 million, in 1987. In terms of quantity, sales of organic pigments in 1988 were 4.3 percent higher than in 1987; in terms of value, sales in 1988 were 1.4 percent higher than in 1987. Changes in U.S. production of pigment has followed overall changes in U.S. economic activity during 1984-88 (see figure 6).

¹ Toners and lakes are essentially the same in their final form; they differ in the method of preparation. A lake is an organic pigment produced by the interaction of a soluble dye, a precipitant, and an absorptive inorganic substrate. A toner is an insoluble dye produced as a powder; some toners are extended by the inclusion of a solid diluent.

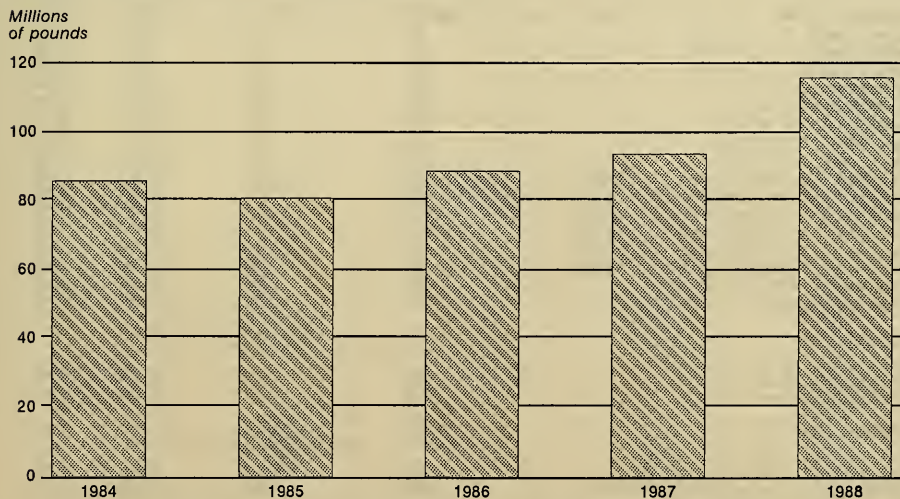
Production of toners in 1988 amounted to 115.2 million pounds, 24 percent more than the 93.1 million pounds reported in 1987. Sales in 1988 were 86.3 million pounds, valued at \$590.1 million, compared with 82.7 million pounds valued at \$582 million, in 1987. In terms of quantity, sales of toners in 1988 were 4.4 percent higher than in 1987; in terms of value, sales were 1.5 percent higher in 1988 than in 1987. The individual toners listed in the report which were produced in the largest quantities in 1988 were Pigment Yellow 12, Pigment Blue 15.3, beta form, Pigment Red 49:1 barium toner, Pigment Red 57:1 calcium toner, Pigment Red 53:1, barium toner, and Pigment Yellow 14.

Production of lakes totaled 741,000 pounds in 1988, 4.8 percent lower than the 778,000 pounds reported for 1987. Sales of lakes in 1987 amounted to 530,000 pounds, valued at \$4.1 million. In terms of quantity, sales of lakes in 1988 were 7.2 percent lower than in 1987; in terms of value, sales in 1988 were 2 percent lower than in 1987.

Table 16 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 17.

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Figure 6
Organic pigments: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 5

Table 15

Organic pigments: U.S. production and sales, 1988

Organic pigments	Production	Sales		Average Unit value ²
		Quantity	Value ¹	
	1,000 pounds dry basis ³	1,000 pounds dry basis ³	1,000 dollars	Per pound
Grand total	115,896	86,875	594,657	\$6.84
Toners				
Total	115,155	86,345	590,524	7.04
Yellow toners, total	27,701	23,305	128,939	5.53
Acetoacetylilide yellows:				
Pigment Yellow 3, C.I. 11 710	53	72	439	6.09
Pigment Yellow 65, C.I. 11 740	187	180	1,531	8.49
Pigment Yellow 73, C.I. 11 738	325	319	1,728	5.41
Pigment Yellow 74, C.I. 11 741	699	664	4,965	7.47
Acetoacetylilide yellows, all other	1,970	784	4,630	5.91
Diarylilide yellows:				
Pigment Yellow 12, C.I. 21 090	16,680	13,869	71,989	5.19
Pigment Yellow 13, C.I. 21 100	797	693	4,230	6.10
Pigment Yellow 14, C.I. 21 095	5,189	5,002	23,235	4.65
Pigment Yellow 17, C.I. 21 105	617	565	3,813	6.75
Pigment Yellow 83, C.I. 21 108	1,029	1,006	10,223	10.16
All other yellow toners	155	151	2,156	14.28
Orange toners, total	2,518	2,397	16,159	6.74
Pigment Orange 5, C.I. 21 075	752	735	3,718	5.06
Pigment Orange 13, C.I. 21 110	138	142	1,380	9.70
Pigment Orange 16, C.I. 21 160	674	588	4,441	7.56
Pigment Orange 34	41	42	387	9.12
Pigment Orange 46, C.I. 15 602	858	847	4,568	5.39
All other orange toners	55	43	1,665	38.47
Red toners, total	50,763	29,516	218,508	7.40
Naphthol reds, total				
Pigment Red 5, C.I. 12 120	1,705	1,740	20,766	11.93
Pigment Red 17, C.I. 12 390	27	46	529	11.45
Pigment Red 22, C.I. 12 315	37	18	176	9.99
Pigment Red 23, C.I. 12 355	222	215	1,804	8.38
Pigment Red 23, C.I. 12 355	137	174	1,964	11.30
All other naphthol reds	1,282	1,287	16,293	12.66
Pigment Red 3, C.I. 12 120	799	877	5,395	6.15
Pigment Red 4, C.I. 12 085	93	87	573	6.60
Pigment Red 38, C.I. 12 120	286	291	2,873	9.39
Pigment Red 48:1, barlum toner, C.I. 15 865	2,078	2,023	11,909	5.89
Pigment Red 48:2, calcium toner, C.I. 15 865	1,683	1,608	8,009	4.98
Pigment Red 49:1, barlum toner, C.I. 15 630	4,679	3,616	15,351	4.25
Pigment Red 49:2, calcium toner, C.I. 15 630	873	789	4,137	5.24
Pigment Red 53:1, barlum toner, C.I. 15 585	4,459	3,302	15,134	4.58
Pigment Red 57:1, calcium toner, C.I. 15 850	13,257	10,658	55,721	5.23
Pigment Red 81, PMA, C.I. 45 160	406	399	6,639	16.64
All other red toners	20,445	4,126	72,001	17.45
Violet toners, total	2,378	2,466	45,557	18.47
Pigment Violet 23, C.I. 51 319	462	509	15,215	29.89
All other violet toners	1,916	1,957	30,342	15.51
Blue toners, total	29,007	25,908	157,403	6.03
Pigment Blue 1, (PMA), C.I. 42 595	100	106	1,575	14.90
Pigment Blue 15, alpha form, C.I. 74 160	1,059	664	5,688	8.56

See footnotes at end of table.

Table 15—Continued
Organic pigments: U.S. production and sales, 1988

Organic pigments	Production	Sales		Average
		Quantity	Value ¹	Unit value ²
	1,000 pounds dry basis ³	1,000 pounds dry basis ³	1,000 dollars	Per pound
Toners—Continued				
Blue toners—Continued				
Pigment Blue 15:1, alpha form, C.I. 74 160	1,516	1,084	11,391	\$10.51
Pigment Blue 15:2, alpha form, C.I. 74 160	787	638	6,109	9.58
Pigment Blue 15:3, beta form, C.I. 74 160	15,376	13,367	73,881	5.53
Pigment Blue 15:4, (β form)	1,558	1,128	6,698	5.94
All other blue toners	8,611	8,921	52,061	5.84
Green toners, total	2,562	2,504	22,349	8.93
Pigment Green 7, C.I. 74 260	2,407	2,334	19,658	8.42
Pigment Green 36	88	103	1,324	12.90
All other green toners	67	67	1,367	20.34
Brown and black toners,	226	249	1,609	6.46
Lakes				
Total	741	530	4,133	7.80
Pigment Red 83, C.I. 58 000	42	29	383	13.21
Pigment Violet 5:1, C.I. 58 055	62	62	613	9.82
All other lakes	637	439	3,137	7.14

¹ The value of sales for toners is reported on a dry-full strength basis and the value of sales for lakes is reported on a dry form basis. All sales value data exclude the additional cost of processing or packaging in commercial forms other than the dry full-strength or dry form.

² Calculated from unrounded figures.

³ Quantities for toners are reported as dry full-strength toner content, excluding the weight of any dispersing agent, vehicle, or extender. Quantities for lakes are reported as dry lake content, excluding the weight of any dispersing agent or vehicle.

Note.—The C.I. (Colour Index) number shown in this report are the identifying number given in the third edition of the Colour Index. The abbreviations PMA and PTA stand for phosphomolybdic and phosphotungstic (including phosphotungstomolybdic) acids, respectively.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 5

Table 16

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Organic pigments	Separate statistics ¹	Manufacturers' identification codes (according to list in table 17)
Toners	Yes	
Yellow toners:	Yes	
Acetoacetarylide yellows:	Yes	
Pigment Yellow 1	No	BAS, DUP, GLX, HCL, HSH, KCW, SNA.
Pigment Yellow 2	No	KCW.
Pigment Yellow 3	Yes	HEU, HSH, KCW, SNA, VPC.
Pigment Yellow 42	No	CGY, VPC.
Pigment Yellow 60	No	HSH.
Pigment Yellow 65	Yes	HEU, HSH, SNA, VPC.
Pigment Yellow 73	Yes	HCL, HSH, SNA, VPC.
Pigment Yellow 74	Yes	BAS, HCL, HEU, HIL, HSH, ROM, SNA, VPC.
Pigment Yellow 97	No	HCL.
Pigment Yellow 98	No	HCL.
All other acetoacetarylide yellows	No	KCW.
Diarylide yellows:	Yes	
Pigment Yellow 12	No	AMS, APO, BAS, FAB, GLX, HCL, HIL, HSH, IND, POP, ROM, SNA.
Pigment Yellow 13	No	AP0, BAS, FAB, GLX, HCL, IDC, IND, ROM, SNA.
Pigment Yellow 14	No	AMS, BAS, BNS, FAB, GLX, HCL, HSH, IDC, IND, ROM, SNA.
Pigment Yellow 17	No	AMS, APO, BAS, CGY, FAB, GLX, HCL, HSH, IDC, IND, ROM, SNA, VPC.
Pigment Yellow 83	No	BAS, FAB, GLX, HCL, IDC, IND, ROM, SNA.
Pigment Yellow 152	No	HCL.
Yellow pigments, other:	No	
(Basic Yellow 2), fugitive	No	MRX.
Pigment Yellow 110	No	CGY.
Pigment Yellow 139	No	VPC.
All other pigment yellow toners	No	HCL, HSH.
Orange toners:	Yes	
Pigment Orange 1	No	KCW.
Pigment Orange 2	No	UHL.
Pigment Orange 5	Yes	BAS, CGY, HCL, HIL, HSH, SNA.
Pigment Orange 13	Yes	BAS, HSH, IND, SNA, VPC.
Pigment Orange 15	No	BNS.
Pigment Orange 16	Yes	BAS, BNS, CGY, FAB, GLX, HSH, IND, ROM.
Pigment Orange 34	No	HCL, IND, ROM, VPC.
Pigment Orange 43	No	HCL.
Pigment Orange 46	Yes	AMS, BAS, CMC, MGR, SNA, UHL.
All other pigment orange toners	No	CGY, GLX.
Red toners:	Yes	
Naphthol reds:	Yes	
Pigment Red 2	Yes	GLX, HCL, HSH.
Pigment Red 5	No	CGY, FAB, GLX, HSH.
Pigment Red 13	No	KCW.
Pigment Red 14	No	HCL.
Pigment Red 17	Yes	BNS, ROM, SNA, UHL.
Pigment Red 21	No	BNS.
Pigment Red 22	Yes	GLX, HEU, IND, MRX, ROM, SNA.
Pigment Red 23	Yes	DUP, FAB, GLX, HEU, HSH, IND, KCW, ROM, SNA, UHL.
Pigment Red 31	No	GLX, HIL, ROM.
Pigment Red 66	No	CGY.
Pigment Red 112	No	HCL, VPC.
Pigment Red 146	No	HCL.
Pigment Red 147	No	HSH.
Pigment Red 170	No	GLX, HCL.
All other naphthol reds	No	BUC, FAB, GLX, IND, KCW, ROM, SNA.

See footnotes at end of table.

Table 16—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Organic pigments	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 17)
Toners—Continued		
Red toners—Continued		
Red pigments, other:	Yes	
Pigment Red 1, (light)	No	HSH.
Pigment Red 3	Yes	BAS, CGY, HIL, HSH, KCW, MRX, SNA, UHL.
Pigment Red 4	Yes	ALE, CGY, HIL, HSH, KCW, MRX, UHL.
Pigment Red 6	No	AMS.
Pigment Red 38	Yes	HCL, HSH, MGR, SNA, VPC.
Pigment Red 41	No	UHL, VPC.
Pigment Red 48	No	CGY.
Pigment Red 48:1, (barium)	Yes	APD, BAS, CGY, CMC, FAB, HEU, HIL, HSH, MGR, MRX, SNA, UHL.
Pigment Red 48:2, (calcium)	Yes	AMS, APO, BAS, CGY, CMC, FAB, HEU, HIL, HSH, MRX, SNA, UHL, VPC.
Pigment Red 48:3, (strontium)	No	CGY, HSH.
Pigment Red 48:4, (manganese)	No	CGY, HEU, HSH, SNA, VPC.
Pigment Red 49:1, (barium)	Yes	AMS, BAS, BNS, CMC, HIL, IDC, MGR, SNA, UHL.
Pigment Red 49:2, (calcium)	Yes	AMS, CMC, HIL, IDC, MGR, SNA, UHL.
Pigment Red 52:1, (calcium)	No	BAS, HSH, MGR, SNA, UHL.
Pigment Red 52:2, (manganese)	No	BAS, CGY, HSH, UHL.
Pigment Red 53, (sodium)	No	FAB.
Pigment Red 53:1, (barium)	Yes	AMS, APO, BAS, CMC, FAB, HCL, HIL, HSH, IDC, MGR, MRX, SNA, UHL.
Pigment Red 57	No	BNS.
Pigment Red 57:1, (calcium)	No	AMS, APO, BAS, BNS, CGY, CMC, FAB, HEU, HIL, HSH, IDC, KCW, MGR, POP, SNA, UHL.
Pigment Red 63	No	HSH.
Pigment Red 81, (PMA)	No	BAS, MGR, MRX, SNA, UHL.
Pigment Red 81, (PTA)	Yes	BAS, MGR, MRX, UHL.
Pigment Red 88	No	VPC.
Pigment Red 101	No	BAS.
Pigment Red 122	No	SNA, VPC.
Pigment Red 123	No	IDC, VPC.
Pigment Red 168	No	VPC.
Pigment Red 169	No	MRX.
Pigment Red 179	No	VPC.
Pigment Red 188	No	HCL.
Pigment Red 190	No	VPC.
Pigment Red 200	No	BAS.
Pigment Red 202	No	SNA, VPC.
Pigment Red 209	No	SNA.
Pigment Red 210	No	HCL.
Pigment Red 224	No	VPC.
Pigment Red 245	No	IND.
Pigment Red 63:1, calcium	No	SNA.
All other pigment red toners	No	FAB, UHL.
Violet toners:	Yes	
Pigment Violet 1, (fugitive)	No	KCW, UHL.
Pigment Violet 1, (PMA)	No	MGR, MRX, UHL.
Pigment Violet 1, (PTA)	No	SNA, UHL.
Pigment Violet 3, (fugitive)	No	KCW, MGR, UHL.
Pigment Violet 3, (PMA)	No	BAS, HIL, MGR, MRX, UHL.
Pigment Violet 3, (PTA)	No	MGR, MRX, UHL.
Pigment Violet 4, (fugitive)	No	KCW.
Pigment Violet 19	No	SNA, VPC.
Pigment Violet 23	No	BUC, HCL, IPP, S, SNA, VPC.
Pigment Violet 27	No	MRX.
Pigment Violet 29	No	SNA, VPC.
Pigment Violet 39, (PMA)	No	BAS.

See footnotes at end of table.

Section 5

Table 16—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Organic pigments	Separate statistics ¹	Manufacturers' identification codes (according to list in table 17)
Toners—Continued		
Violet toners—Continued		
All other pigment violet toners	No	BUC, (2).
Blue toners:		
(Basic Blue 7)	No	KCW.
Pigment Blue 1, (PMA)	Yes	BNS, HIL, MGR, MRX, UHL.
Pigment Blue 1, (PTA)	No	MRX.
Pigment Blue 2, (PMA)	No	UHL.
Pigment Blue 14, (PMA)	No	BAS, UHL.
Pigment Blue 15, (α form)	Yes	BAS, CGY, FAB, HEU, HSH, SNA.
Pigment Blue 15:1, (α form)	Yes	CGY, HEU, HIL, SNA, VPC.
Pigment Blue 15:2, (α form)	Yes	CGY, DUP, HEU, HIL, SNA, VPC.
Pigment Blue 15:3, (β form)	Yes	AMS, APO, BAS, CGY, CIK, CMC, HEU, HIL, IDC, IPP, MGR, POP, ROM, SNA, VPC.
Pigment Blue 15:4, (β form)	Yes	BAS, CGY, HEU, POP, SNA, VPC.
Pigment Blue 19	No	PSG.
Pigment Blue 25	No	GLX.
Pigment Blue 61	No	BAS.
Pigment Blue 62	No	MRX.
All other pigment blue toners	No	FAB.
Green toners:		
Pigment Green 1, (PMA)	No	MRX, UHL.
Pigment Green 2, (PTA)	No	MRX, UHL.
Pigment Green 4, (fugitive)	No	UHL.
Pigment Green 4, (PMA)	No	UHL.
Pigment Green 7	Yes	ALG, BAS, CGY, HCL, HIL, POP, SNA, VPC.
Pigment Green 8	No	KCW.
Pigment Green 10	No	HEU.
Pigment Green 36	Yes	BAS, SNA, VPC.
All other pigment green toners	No	(2).
Brown toners:		
Pigment Brown 5	No	GLX.
Black toners:		
Pigment Black 7	No	HCL, VPC.
All other pigment black toners	No	UHL.
Lakes	Yes	
Yellow lakes:		
(Acid Yellow 23)	No	
Orange lakes:		
Pigment Orange 17	No	KCW.
Red lakes:		
(Acid Red 26)	No	KCW.
(Basic Red 1)	No	BNS.
(Basic Red 81, PMA)	No	LVR.
Pigment Red 60:1	No	HSH, MRX, SNA.
Pigment Red 83	Yes	HSH, MRX, UHL.
Violet lakes:		
(Basic Violet 1)	No	BNS.
(Basic Violet 4)	No	BNS.
(Basic Violet 10)	No	BNS.
Violet 5:1	Yes	HSH, MRX, UHL, VPC.
Blue lakes:		
(Basic Blue 14, PMA)	No	LVR.
(Basic Blue 1, PTA)	No	LVR.
Green lakes:		
(Basic Green 1, PMA)	No	LVR.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 17

Organic pigments: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ALE	Alex Color Co.	HEU	Heubach, Inc.
ALG	Allegheny Chemical Corp.	HIL	Hilton Davis Company
AMS	Ridgway Color Co.	HSH	Engelhard Corporation
APO	Apollo Colors, Inc.	IDC	Industrial Color, Inc.
BAS	BASF Corp.	IND	Indol Color Co., Inc.
BNS	Binney and Smith, Inc.	IPP	Spectrachem Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	KCW	Keystone Color Works, Inc.
CGY	Ciba-Geigy Corp.	LVR	C. Lever Co., Inc.
CIK	Filint Ink Corp., Cal/Ink Div.	MGR	Magruder Color Co., Inc.
CMC	Chromatic Color Corp.	MAX	Max Marx Color Corp.
DUP	E.I. Dupont De Nemours & Co., Inc., Chemicals and Pigments Dept.	POP	Pope Chemical Corp.
FAB	Fabricolor Manufacturing Corp.	PSG	PMC Specialities Group, Inc.
GLX	Galaxie Chemical Corp.	ROM	Roma Color, Inc.
HCL	Hoechst Celanese Corp.: Rhode Island Works Sou-Tex Works	S	Sandoz Inc. Colors and Chemicals Div.
		SNA	Sun Chemical Corp., Pigment Div.
		UHL	Paul Uhlich & Co., Inc.
		VPC	Mobay Chemical Corp., Dyes & Pigments Div.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 6

Medicinal Chemicals

Medicinal chemicals include the medicinal and feed grades of all organic chemicals having therapeutic value, whether obtained by chemical synthesis, by fermentation, by extraction from naturally occurring plant or animal substances, or by refining a technical grade product. They include antibiotics and other anti-infective agents, antihistamines, autonomic drugs, cardiovascular agents, central nervous system depressants and stimulants, hormones and synthetic substitutes, vitamins, and other therapeutic agents for human or veterinary use, and for animal feed supplements. Data for the production of these products during 1984-88 are shown in figure 7.

Table 18 shows statistics for production and sales of medicinal chemicals grouped by pharmacological class. The statistics shown are for bulk chemicals only. Finished pharmaceutical preparations and products put up in pills, capsules, tablets, or other measured doses are excluded.¹ The difference between production and sales reflects inventory changes, processing losses, and captive consumption of medicinal

chemicals processed into ethical and proprietary pharmaceutical products by the primary manufacturer. In some instances, the difference may also include quantities for medicinal grade products used as intermediates; for example, penicillin V used as an intermediate in the manufacture of other antibiotics. All quantities are given in terms of 100 percent content of the pure bulk drug. Table 19 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 20.

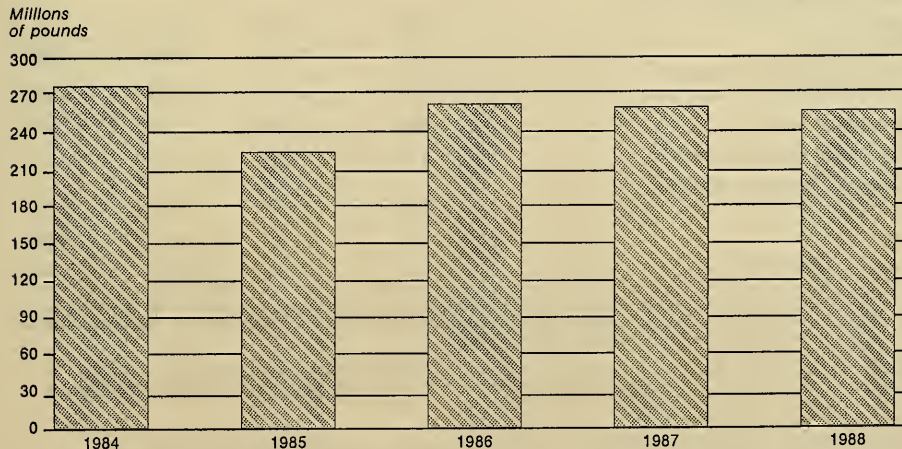
Total U.S. production of bulk medicinal chemicals in 1988 amounted to 258.2 million pounds. Total sales of bulk medicinal chemicals in 1988 amounted to 227.9 million pounds, valued at \$1,831.0 million. Beginning in 1980, methionine and most other amino acids and their salts are reported in the section on Miscellaneous End-Use Chemicals and Chemical Products. Section totals are not, therefore, comparable with years prior to 1980.

Production of the larger groups of medicinal chemicals in 1988 was as follows (see table 18): Antibiotics, 28.8 million pounds, 18.9 percent lower than in 1987; anti-infective agents other than antibiotics, 19.1 million pounds, 10.3 percent lower than in 1987; central nervous system depressants and stimulants, 49.2 million pounds, 31.6 percent lower than in 1987; gastrointestinal agents and therapeutic nutrients, 99.7 million pounds, 55.3 percent higher than in 1987; and vitamins, 38.5 million pounds, 25 percent lower than in 1987.

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¹ Complementary statistics on the dollar value of manufacturers' shipments of finished pharmaceutical preparations, except biologicals, are published annually by the U.S. Department of Commerce, Bureau of the Census, in Current Industrial Reports, Series MA-28G. Many pharmaceutical manufacturers that report to the Bureau of the Census are excluded from the U.S. International Trade Commission report because they are not primary producers of medicinal chemicals; that is, they do not themselves produce the bulk drugs which go into their pharmaceutical products, but purchase their drug requirements from domestic or foreign producers.

Figure 7
Medicinal chemicals: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 18
Medicinal chemicals: U.S. production and sales, 1988

Medicinal chemicals	Production ¹	Sales		Average Unit value ²
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	258,201	227,899	1,831,011	\$8.03
Acyclic	99,161	117,018	208,031	1.78
Benzenoid ³	117,435	81,719	844,467	10.33
Cyclic nonbenzenoid ⁴	41,605	29,162	778,513	26.70
Antibiotics, total	28,827	10,247	550,839	53.76
Penicillins, total ⁵	6,308	1,577	36,298	23.02
All other antibiotics, total	22,519	8,670	514,541	59.35
For medicinal use ⁶	7,466	3,225	430,800	133.58
For nonmedicinal uses ⁷	15,053	5,445	83,741	15.38
Antihistamines, total	445	328	48,266	147.15
Antinauseants	45	28	1,173	41.89
All other antihistamines	400	300	47,093	156.98
Anti-infective agents (except antibiotics), total	19,093	8,171	39,362	4.82
Anthelmintics	7,747	3,435	3,265	.95
All other anti-infective agents (except antibiotics) ⁹	11,346	4,736	36,097	7.62
Autonomic drugs, total	980	726	21,007	28.94
Sympathomimetic (adrenergic) agents	942	(⁹)	(⁹)	(⁹)
All other autonomic drugs	38	(⁹)	(⁹)	(⁹)
Central depressants and stimulants, total	49,193	54,321	380,406	7.00
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents, total	42,822	50,865	158,301	3.11
Aspirin	23,693	(⁹)	(⁹)	(⁹)
All other analgesics, antipyretics, and nonhormonal anti-inflammatory agents ¹⁰	19,129	50,865	158,301	3.11
Antidepressants	100	36	11,992	333.11
Antitussives	262	390	49,652	127.31
All other central depressants and stimulants ¹¹	6,009	3,030	160,461	52.96
Dermatological agents	15,012	7,446	7,052	.95
Expectorants and mucolytic agents	1,111	883	7,836	8.87
Gastrointestinal agents and therapeutic nutrients ¹²	99,713	115,743	85,663	.74
Vitamins ¹³	38,542	26,898	121,529	4.52
Miscellaneous medicinal chemicals ¹⁴	5,285	3,136	569,051	181.46

¹ The data on production and sales are for bulk medicinal chemicals only. Methionine and most other amino acids and their salts are now reported in the section on Miscellaneous End-Use Chemicals and Chemical Products. Section totals are not, therefore, comparable with years prior to 1980.

² Calculated from rounded figures.

³ Benzenoid, as used in this report, describes any cyclic medicinal chemical whose molecule contains either a 6-membered carbocyclic ring with conjugated double bonds or a 6-membered heterocyclic ring with 1 or 2 hetero atoms and conjugated double bonds, except the pyrimidine ring.

⁴ Includes antibiotics of unknown structure.

⁵ Includes semisynthetic penicillins and all other penicillins.

⁶ Includes production and sales of antifungal and antitubercular antibiotics, tetracyclines, and cephalosporins.

⁷ Includes production and sales of tetracyclines.

Footnotes for table 18—Continued

⁹ Includes production and sales of antiprotozoan agents, sulfonamides, and urinary antiseptics; does not include production of sulfaquinidine used as an intermediate in the production of anti-infective sulfonamides.

⁹ Reported data were accepted in confidence and may not be published, or no data were reported.

¹⁰ Includes sales quantity and value of aspirin.

¹¹ Includes production and sales of amphetamines; general anesthetics; respiratory and cerebral stimulants; skeletal muscle relaxants; tranquilizers; and anticonvulsants, hypnotics, and sedatives.

¹² Methionine and its salts are reported in the section in Miscellaneous End-Use Chemicals and Chemical Products under amino acids.

¹³ Includes production and sales of vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, and vitamin K.

¹⁴ Includes production and sales of antineoplastic agents, cardiovascular agents, diagnostic agents, hematological agents, renal-acting and edema-reducing agents, and unclassified medicinal chemicals. Also includes production and sales of local anesthetics, smooth muscle relaxants (including theophylline derivatives), and hormones and synthetic substitutes.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 19

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Antibiotics:	Yes	
Cephalosporins:	No	
Cefaclor	No	LIL.
Cefamandole	No	LIL.
Cefazolin, sodium	No	LIL.
Cefoxitin	No	MRK.
Cephalexin	No	BOC, LIL, TRD.
Cephalothin, sodium	No	LIL.
Cephradine	No	PFZ, TRD.
Penicillins:	Yes	
Penicillins, semisynthetic:		
Amoxicillin:		
Amoxicillin (trihydrate)	No	BEE, BOC, BRS, KAN.
Amoxicillin (anhydrous)	No	BEE, BRS.
Ampicillin:		
Ampicillin (anhydrous)	No	BRS.
Ampicillin (trihydrate)	No	BOC, BRS, KAN.
Other semisynthetic penicillins:		
Ampicillin, sodium	No	BEE, BRS, WYT.
Carbenicillin, disodium	No	PFZ.
Carbenicillin indanyl, sodium	No	BEE.
Cloxacillin, sodium	No	BEW, BOC.
Cyclacillin	No	BOC.
Dicloxacillin, sodium	No	BEE, BOC, WYT.
Hetacillin, potassium	No	BRS.
Nafcillin, sodium	No	BEE, WYT.
Oxacillin, sodium	No	BEE, BOC.
Piperacillin	No	BRS.
Ticarcillin, disodium	No	BEE, BEW.
All other semisynthetic penicillins	No	BEE.
Penicillins (except semisynthetic):		
For medicinal use:		
Penicillin G, benzathine	No	WYT.
Penicillin G, potassium	No	PFZ.
Penicillin V, potassium	No	LIL, PFZ.
Penicillin G, procaine (medicinal grade)	No	PFZ, WYT.
For nonmedicinal uses:		
Penicillin G, procaine (animal feed grade)	No	PFZ.
Tetracyclines:		
For medicinal use:		
Chlortetracycline (medicinal grade)	No	ACY.
Minocycline	No	ACY.
Oxytetracycline (medicinal grade)	No	PFZ.
Tetracycline	No	ACY.
For nonmedicinal uses:		
Chlortetracycline (animal feed grade)	No	ACY, PFZ.
Oxytetracycline (animal feed grade)	No	PFZ.
Other antibiotics:		
For medicinal use:	Yes	
Antifungal antibiotics:	Yes	
Amphotericin B	No	PEN, TRD.
Nystatin (medicinal grade)	No	ACY, TRD.
Tobramycin	No	LIL.
Antitubercular antibiotics:	No	
Cycloserine	No	LIL.
Dihydrostreptomycin	No	PFZ.
Other antibiotics for medicinal use:	No	
Apramycin	No	LIL.
Aztreonam	No	TRD.
Cefonicid	No	SK.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 20)
Antibiotics—Continued	Yes	
Other antibiotics—Continued	Yes	
For medicinal use—Continued		
Other antibiotics for medicinal use—Continued		
Cefuroxime	No	LIL.
Clindamycin	No	ABB, UPJ.
Erythromycin	No	ABB, ANG, UPJ.
Erythromycin estolate	No	LIL.
Erythromycin stearate	No	UPJ.
Erythromycin succinate	No	ANG.
Erythromycin thiocyanate	No	ANG.
Gentamycin	No	SCH.
Imipenem	No	MRK.
Kanamycin	No	BRS.
Lincomycin (medicinal grade)	No	UPJ.
Neomycin (medicinal grade)	No	UPJ.
Netilmicin	No	SCH.
Novobiocin, sodium	No	UPJ.
Polymyxin B	No	PFZ.
Sisomicin	No	SCH.
Spectinomycin (medicinal grade)	No	ABB, UPJ.
Thiostrepton	No	TRD.
Vancomycin	No	ABB, ACY, LIL.
All other antibiotics, for medicinal use	No	ABB, RSA.
For nonmedicinal uses:	Yes	
Bacitracin (animal feed grade)	No	IMC.
Cycloheximide	No	UPJ.
Hygromycin B	No	LIL.
Lasalocid, sodium	No	HOF.
Lincomycin (animal feed grade)	No	UPJ.
Monesin	No	LIL.
Neomycin (animal feed grade)	No	PFZ, UPJ.
Novobiocin (animal feed grade)	No	UPJ.
Spectinomycin (animal feed grade)	No	UPJ.
Streptomycin	No	PFZ.
Tylosin	No	LIL.
Antihistamines:	Yes	
Antinauseants:	Yes	
Dimenhydrinate	No	GAN.
Meclizine hydrochloride	No	PFZ.
Metoclopramide hydrochloride	No	LLI.
Trimethobenzamide hydrochloride	No	HOF.
Other antihistamines:	Yes	
Brompheniramine maleate	No	HEX, LLI.
Chlorpheniramine maleate	No	HEX.
Chlorpheniramine tannate	No	HEX.
Cyproheptadine hydrochloride	No	MRK.
Dexbrompheniramine maleate	No	ABB, HEX.
Dimethindene maleate	No	CGY.
Diphenhydramine citrate	No	WYK.
Diphenhydramine hydrochloride	No	PD.
Doxylamine succinate	No	BKC.
Laradine	No	SCH.
Phenindamine tartrate	No	HOF.
Phenyltoloxamine citrate	No	GAN.
Pyrilamine maleate	No	HEX.
Pyrilamine tannate	No	HEX.
Terfenadine	No	DOW.
Tripelennamine	No	CGY.
Tripelennamine citrate	No	CGY.

See footnotes at end of table.

Section 6

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Antihistamines—Continued	Yes	
Other antihistamines—Continued	Yes	
Tripeleannamine hydrochloride	No	CGY.
Triprolidine hydrochloride	No	AMD, BUR.
Anti-infective agents (except antibiotics):	Yes	
Anthelmintics:	Yes	
Clorsulon	No	MRK.
Diethylcarbamazine citrate	No	SK.
Ivermectin	No	MRK.
Piperazine	No	TX, UCC.
Piperazine dihydrochloride	No	FLM.
Piperazine hexahydrate	No	BRS.
Piperazine hydrochloride	No	FLM.
Piperazine sulfate	No	FLM.
Pyrantel pamoate	No	PFZ.
Thiabendazole	No	MRK.
Antiprotozoan agents:	No	
Arsenic and bismuth compounds:	No	
Arsanilic acid	No	FLM.
Nitarsone	No	SAL.
Roxarsone	No	SAL.
Roxarsone, sodium	No	SAL.
Other antiprotozoan agents:		
Amprolium	No	MRK.
Dinitolmide	No	SAL.
Ethopabate	No	MRK.
Hydroxychloroquine sulfate	No	SD.
Iodochlorhydroxyquin	No	CGY.
Metronidazole	No	SRL.
Nitromide	No	SAL.
Sulfonamides:	No	
Mafenide	No	SDW.
Mafenide acetate	No	SDW.
Sulfabenzamide	No	ACY.
Sulfacetamide, sodium	No	SCH.
Sulfadiazine	No	ACY, BOT.
Sulfadiazine, silver	No	LEM.
Sulfadimethoxine	No	HOF.
Sulfamethazine	No	SAL.
Sulfamethazine, sodium	No	SAL.
Sulfamethizole	No	ACY.
Sulfamethoxazole	No	HOF.
Sulfantran	No	SAL.
Sulfasalazine	No	SAL.
Sulfathiazole, sodium	No	SAL.
Sulfisoxazole	No	HOF.
Sulfisoxazole, acetyl	No	HOF.
Urinary antiseptics:		
Methenamine	No	ARN.
Methenamine hippurate	No	RIK.
Methenamine mandelate	No	ARN, PD.
Other anti-infective agents:	No	
Antifungal agents:	No	
Benzoic acid	No	KLM.
Calcium undecylenate	No	WTL.
Sodium caprylate	No	LEM.
Zinc undecylnate	No	WTL.
All other antifungal agents	No	ARN.
Antileprotic and antitubercular agents:	No	
Aminosalicylic acid	No	HXL.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Anti-infective agents (except antibiotics)—Continued	Yes	
Other anti-infective agents—Continued		
Antileprotic and antitubercular agents—Continued	No	
Sodium aminosalicylate	No	HXL.
Sulfoxone, sodium	No	ABB.
Antiviral agents:	No	
Acyclovir	No	BUR.
Amantadine hydrochloride	No	HEX.
Azidothymidine	No	BUR.
Rimantidine hydrochloride	No	HOF.
Antiviral agents, all other	No	(²).
General antiseptics and antibacterial agents:	No	
Bromchlorenone	No	MHI.
Capreomycin	No	LIL.
Ceftazidime	No	LIL, MRK, SK, (²).
Ceftazidime dihydrochloride	No	SK.
Cetylpyridinium chloride	No	HXL.
Cinoxacin	No	LIL.
m-Cresyl acetate	No	ADC.
8-Hydroxy-5-quinolinesulfonic acid	No	MRK.
Iodoform	No	DPW, MAL.
Magnesium salicylate	No	ARN.
Ormetoprim	No	HOF.
Pentamidine isethionate	No	MRX.
Povidone - iodine	No	GAF.
Resorcinol	No	KPT.
Trimethoprim	No	BUR.
Autonomic drugs:	Yes	
Sympathomimetic agents:	Yes	
Albuterol sulfate	No	SCH.
Dobutamine	No	LIL.
Methoxyphenamine hydrochloride	No	HXL.
Naphazoline hydrochloride	No	CGY.
Phenylephrine bitartrate	No	GAN.
Phenylephrine hydrochloride	No	GAN, SDW.
Phenylephrine tannate	No	HEX.
Phenylpropanolamine bitartrate	No	ARS.
Phenylpropanolamine hydrochloride	No	ARS, GAN, HXL, ORT.
Propylhexedrine	No	SK.
Pseudoephedrine hydrochloride	No	BUR, GAN.
Pseudoephedrine sulfate	No	GAN.
Terbutaline sulfate	No	CGY.
Tetrahydrozoline hydrochloride	No	PFZ.
All other sympathomimetic (adrenergic) agents	No	ARN.
Other autonomic drugs:	Yes	
Parasympatholytic quaternary ammonium compounds (except tropane derivatives):	No	
Glycopyrrolate	No	LLI.
Isopropamide iodide	No	SK.
Propantheline bromide	No	SRL.
Parasympatholytic tertiary amines (except tropane derivatives):	No	
Oxybutynin chloride	No	ABB.
Oxyphencyclimine hydrochloride	No	PFZ.
Parasympatholytic tropane derivatives:	No	
Benztrapine mesylate	No	MRK, (²).
Parasympathomimetic agents:	No	
Bethanechol chloride	No	GAN, MRK.
Neostigmine methylsulfate	No	HOF.
Pyridostigmine bromide	No	HOF.

See footnotes at end of table.

Section 6

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Autonomic drugs—Continued	Yes	
Other autonomic drugs—Continued	Yes	
Sympatholytic agents:		
Timolol maleate	No	MRK.
Central depressants and stimulants:	Yes	
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents:	Yes	
Acetaminophen	No	MAL, MON, SDW.
Aspirin	Yes	DOW, MON, NOR, SD.
Aurothioglucose	No	SCH.
Choline magnesium salicylate	No	LEM.
Diflunisal	No	MRK.
Fenoprofen	No	LIL, WYK.
Fentanyl citrate	No	MRX.
Flunixin	No	SCH.
Gold sodium thiomalate	No	MRX.
Hydromorphone hydrochloride	No	PEN.
Ibuprofen	No	TNA, UPJ.
Indomethacin	No	MRK.
Meclofenamate, sodium	No	PD, WYK.
Meclofenamic acid	No	PD.
Mefenamic acid	No	PD.
Meperidine hydrochloride	No	PEN, SDW.
Methadone hydrochloride	No	MAL.
Morphine sulfate	No	MAL, PEN, SAL.
Oxycodone hydrochloride	No	DUP, MAL, PEN.
Oxycodone terephthalate	No	PEN.
Pentazocine	No	SD.
Pentazocine hydrochloride	No	SD.
Phenylbutazone	No	CGY.
Piroxicam	No	PFZ.
Potassium aminobenzoate	No	GAN.
Potassium salicylate	No	KLM.
Propoxyphene hydrochloride	No	ABB, GAN, LIL.
Propoxyphene napsylate	No	ABB, GAN, LIL.
Salsalate	No	WYK.
Sodium aminobenzoate	No	GAN.
Sodium salicylate	No	KLM.
Sulfentanil citrate	No	MRX.
Sulindac	No	MRK.
Anticonvulsants, hypnotics, and sedatives:		
Anticonvulsants (except barbiturates):	No	
Ethosuximide	No	PD.
Ethotoin	No	ABB.
Methsuximide	No	PD.
Phensuximide	No	PD.
Phenytoin	No	PD.
Phenytoin, sodium	No	PD.
Valproic acid	No	ABB.
Barbiturates:	No	
Amobarbital	No	GAN.
Amobarbital, sodium	No	GAN.
Butabarbital	No	GAN.
Butabarbital, sodium	No	ABB.
Butalbital	No	GAN.
Pentobarbital	No	GAN.
Phenobarbital	No	GAN.
Phenobarbital, sodium	No	GAN.
Poly(oxy-1,2-ethanedyl)- α -carboxymethyl, omega-(tridecyloxy), potassium salt	No	GAN.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Central depressants and stimulants—Continued		
Anticonvulsants, hypnotics, and sedatives—Continued		
Barbiturates—Continued		
Secobarbital	No	GAN.
Secobarbital, sodium	No	GAN.
Thiamylal, sodium	No	ABB, PD.
Thiopental, sodium	No	ABB.
Hypnotics and sedatives (except barbiturates):	No	
Ethchlorvynol	No	ABB.
Glutethimide	No	GAN.
Methpyrion	No	HOF.
All other hypnotics and sedatives, other than barbiturates	No	UPJ.
Antidepressants:	Yes	
Amitriptyline hydrochloride	No	MRK.
Amoxapine	No	WYK.
Doxepin hydrochloride	No	PFZ.
Fluoxetine	No	LIL.
Imipramine hydrochloride	No	CGY.
Maprotiline hydrochloride	No	ABB, CGY.
Nortriptyline hydrochloride	No	LIL.
Protriptyline hydrochloride	No	MRK, WYK.
Antitussives:	Yes	
Benzonatate	No	CGY.
Codeine	No	MAL, PEN.
Dextromethorphan hydrobromide	No	AMD, HOF.
Hydrocodone bitartrate	No	MAL, PEN.
Noscapine	No	MAL, PEN.
Thebaine	No	MAL, PEN.
Tranquillizers:	No	
Phenothiazine derivatives:	No	
Chlorpromazine hydrochloride	No	SK.
Fluphenazine hydrochloride	No	TRD.
Perphenazine	No	SCH.
Other tranquillizers:	No	
Clorazepate dipotassium	No	ABB.
Haloperidol	No	SRL.
Hydroxyzine hydrochloride	No	LEM, PFZ.
Hydroxyzine pamoate	No	PFZ.
Loxapine succinate	No	WYK.
Prazepam	No	PD.
Thiothixene hydrochloride	No	PFZ.
Other central depressants and stimulants:	Yes	
Amphetamines:	No	
Dextroamphetamine sulfate	No	ARN.
Methamphetamine hydrochloride	No	ARN.
General anesthetics:	No	
Enflurane	No	OH.
Isoflurane	No	OH.
Ketamine hydrochloride	No	BRS, PD.
Respiratory and cerebral stimulants:	No	
Caffeine (natural and synthetic):	No	
Caffeine, natural	No	CPR, GNf.
Caffeine, synthetic	No	PFZ.
Other respiratory and cerebral stimulants:	No	
Diethylpropion hydrochloride	No	GAN.
Doxapram hydrochloride	No	LLI.
Methylphenidate hydrochloride	No	CGY.
Pemoline	No	ABB.
Phendimetrazine	No	GAN.
Phentermine	No	GAN, SDW.
Phentermine hydrochloride	No	HEX.

See footnotes at end of table.

Section 6

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

<i>Medicinal chemicals</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
Central depressants and stimulants—Continued		
Other central depressants and stimulants—Continued		
Skeletal muscle relaxants:		
Chlorphenesin carbamate	No	UPJ.
Cyclobenzaprine hydrochloride	No	MRK.
Methocarbamol	No	LLI.
Orphenadrine citrate	No	ABB, WYK.
Succinylcholine chloride	No	ABB, BUR.
Tubocurarine	No	ABB.
All other skeletal muscle relaxants	No	UPJ.
Dermatological agents:		
Aluminum phenolsulfonate	No	SAL.
Ammonium phenolsulfonate	No	SAL.
Salicylic acid	No	DOW, KLM, MON.
Zinc phenolsulfonate	No	MAL, SAL.
Zinc salicylate	No	RSA.
Expectorants and mucolytic agents:		
Ethylenediamine dihydroiodide	No	AJY, DPW.
Guafenesin	No	LLI, NOR.
Iodinated glycerol	No	(?).
Gastrointestinal agents and therapeutic nutrients:		
Gastrointestinal agents:		
Choline chloride (all grades):	No	
Choline chloride (animal feed grade)	No	CHO, HFT, NUT, TMH.
Choline chloride (medicinal grade)	No	CHO, HFT.
Other gastrointestinal agents:		
Acetylcholine chloride	No	RSA.
Betaine hydrochloride	No	CHO, HFT.
Calcium polycarbophil	No	DAN, LLI.
Choleretics and hydrocholeretics	No	UPJ.
Choline bicarbonate	No	CHO, HFT.
Choline bitartrate	No	CHO, HFT.
Choline citrate	No	CHO.
Choline dihydrogen citrate	No	CHO, HFT.
Cimetidine	No	SK.
Cimetidine hydrochloride	No	SK.
Colestipol hydrochloride	No	UPJ.
Dihydroxyaluminum aminoacetate	No	CHT.
Diphenoxylate	No	MAL.
Docusate, calcium	No	MAL.
Docusate, potassium	No	ACY.
Docusate, sodium	No	ACY, MAL.
Famotidine	No	MRK.
Gemfibrozil	No	PD.
Methscopolamine bromide	No	UPJ.
Nizatidine	No	LIL.
Probucol	No	DOW.
Sucralfate	No	SK.
Therapeutic nutrients:		
Calcium gluceptate	No	PFN.
Copper gluconate	No	PFZ.
Magnesium gluconate	No	PFZ.
Manganese gluconate	No	PFZ.
Potassium gluconate	No	PFZ.
Zinc gluconate	No	PFZ.
Hormones and synthetic substitutes:		
Anabolic agents and androgens:		
Androstenedione	No	UPJ.
Fluoxymesterone	No	UPJ.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Hormones and synthetic substitutes—Continued		
Anabolic agents and androgens—Continued		
Methyltestosterone	No	(²).
Testosterone	No	(²).
Testosterone cypionate	No	(²).
Testosterone propionate	No	(²).
Zeranol	No	IMC.
All other anabolic agents and androgens	No	UPJ.
Corticosteroids:		
Aclomethasone	No	SCH.
Beclomethasone	No	SCH.
Betamethasone	No	SCH, (²).
Betamethasone dipropionate	No	SCH.
Betamethasone sodium phosphate	No	SCH.
Betamethasone valerate	No	SCH.
Cortisone acetate	No	MRK, UPJ.
Dexamethasone	No	MRK, (²).
Dexamethasone acetate	No	MRK.
Dexamethasone sodium phosphate	No	MRK, (²).
Diflorasone diacetate	No	UPJ.
Fludrocortisone acetate	No	UPJ.
Fluorometholone	No	UPJ.
Halcinonide	No	TRD.
Hydrocortisone	No	UPJ.
Hydrocortisone acetate	No	UPJ.
Isoflupredone, acetate	No	(²).
Medrysone	No	UPJ.
Methylprednisolone	No	ABB, UPJ.
Prednisolone	No	MRK, UPJ.
Prednisolone acetate	No	UPJ.
Prednisone	No	UPJ.
Triamcinolone	No	TRD, (²).
Triamcinolone acetonide	No	TRD, (²).
Triamcinolone diacetate	No	TRD, (²).
Estrogens and progestogens:		
Estrogens:	No	
Estradiol cypionate	No	UPJ.
Estrogens, conjugated	No	ORG.
Estrogens, esterified	No	ORG.
All other estrogens	No	ORG.
Progestogens:	No	
Dinoprostone	No	UPJ.
Hydroxyprogesterone caproate	No	UPJ.
Medroxyprogesterone acetate	No	(²).
Megestrol acetate	No	UPJ.
Melengestrol acetate	No	UPJ.
Progesterone	No	UPJ.
All other progestins	No	UPJ.
Synthetic hypoglycemic agents:		
Acetohexamide	No	LIL.
Chlorpropamide	No	PFZ.
Glipizide	No	PFZ.
Tolazamide	No	(²).
Tolbutamide	No	UPJ.
Thyroid hormone and antithyroid agents:		
Methimazole	No	LIL.
Thyroglobulin	No	NEP.
Thyroid	No	ARP.

See footnotes at end of table.

Section 6

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Hormones and synthetic substitutes—Continued		
Other hormones and synthetic substitutes:		
Calcitonin	No	ARP.
Corticotropin	No	ARP, ORG.
Danazol	No	SD.
Flutamide	No	SCH.
Gonadorelin, acetate	No	ABB.
Humatrope	No	LIL.
Insulin	No	LIL.
Local anesthetics:		
Benzocaine	No	MAL, WYK.
Butamben	No	ABB, WYK.
Dibucaine	No	CGY.
Dibucaine hydrochloride	No	CGY.
Lidocaine	No	LEM, WYK.
Lidocaine hydrochloride	No	LEM, WYK.
Pramoxine hydrochloride	No	ABB.
Tetracaine hydrochloride	No	UPJ.
Renal-acting and edema-reducing agents:		
Benzothiadiazine derivatives:		
Benzthiazide	No	PFZ.
Chlorothiazide	No	MRK.
Hydrochlorothiazide	No	CGY, MRK.
Polythiazide	No	PFZ.
Other renal-acting and edema-reducing agents:		
Amiloride hydrochloride	No	MRK.
Canrenoate, potassium	No	SRL.
Ethacrynic acid	No	MRK.
Furosemide	No	SAL.
Probenecid	No	MRK, SAL.
Spiranolactone	No	SRL.
Triamterene	No	GAN, SK.
Smooth muscle relaxants:		
Atracurium besylate	No	BUR.
Flavoxate hydrochloride	No	SK.
Oxtriphylline	No	PD.
Theophylline sodium glycinate	No	CHT.
Vitamins:	Yes	
Vitamin A:		
Beta carotene (provitamin A)	No	HOF.
Tretinoin (vitamin A acid)	No	EK.
Vitamin A acetate (animal feed grade)	No	HOF.
Vitamin A acetate (medicinal grade)	No	HOF.
Vitamin A alcohol	No	EK, HOF.
Vitamin A palmitate (medicinal grade)	No	HOF.
All other vitamin A	No	EK.
Vitamin B-complex:		
Niacin and derivatives:		
Niacin (medicinal grade)	No	RIL.
Niacinamide (medicinal grade)	No	NEP, RIL.
Niacinamide hydroiodide	No	DPW.
Pantothenic acid derivatives:		
Dexpanthenol	No	HOF.
Panthenol	No	HOF.
Other B-complex vitamins:		
Biotin	No	HOF.
Cyanocobalamin (animal feed grade)	No	MRK.
Cyanocobalamin (U.S.P. crystalline)	No	MRK.
Riboflavin (animal feed grade)	No	MRK.
Riboflavin (medicinal grade)	No	HOF.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 20)
Vitamins—Continued		
Vitamin B-Complex—Continued		
Other B-Complex vitamins—Continued		
Riboflavin-5-phosphate, sodium	No	HOF.
Thiamine hydrochloride	No	HOF.
Thiamine mononitrate	No	HOF.
Vitamin C:		
Ascorbic acid	No	HOF.
Calcium ascorbate	No	HOF.
Sodium ascorbate	No	HOF.
Vitamin D:		
Cholecalciferol (vitamin D)	No	DUP.
7-Dehydrocholesterol (provitamin D)	No	DUP.
Ergocalciferol (vitamin D)	No	VTM.
All other vitamin D	No	UPJ.
Vitamin E:		
DL-alpha tocopheryl acetate (all grades):	No	
dl-alpha Tocopheryl acetate (animal feed grade)	No	BAS, HOF.
dl-alpha Tocopheryl acetate (medicinal grade)	No	BAS, HOF.
Other vitamin E:		
d-alpha Tocopherol	No	EKT.
dl-alpha Tocopherol	No	HOF.
d-alpha Tocopheryl acetate	No	EKT.
d-alpha Tocopheryl acid succinate	No	EKT.
Miscellaneous medicinal chemicals:		
	Yes	
Antineoplastic agents:		
Azathioprine	No	BUR.
Carboplatin	No	MRX.
Cisplatin	No	MRX.
Cytarabine	No	PFN, UPJ.
Leuprolide acetate	No	ABB.
Methotrexate	No	BRS.
Procarbazine hydrochloride	No	BRS, HOF.
Streptozocin	No	PFN, UPJ.
Tilamsolol	No	TNA.
Vinblastine sulfate	No	LIL.
Vincristine sulfate	No	LIL.
All other antineoplastic agents	No	(²).
Cardiovascular agents:		
	No	
Antihypertensive agents:		
Captopril	No	TRD.
Diazoxide	No	SCH.
Dilevalol hydrochloride	No	SCH.
Hydralazine hydrochloride	No	CGY.
Lisinopril	No	MRK.
Methyldopa	No	MRK.
Metoprolol tartrate	No	CGY.
Minoxidil	No	UPJ.
Nadolol	No	TRD.
Prazosin hydrochloride	No	ABB, PFZ.
Sodium nitroprusside	No	ABB.
Terazosin	No	ABB.
Enalapril maleate	No	MRK.
Vasodilators:		
Nicotinyl alcohol tartrate	No	ARN.
Nifedipine	No	PFZ.
Other cardiovascular agents:		
Diltiazem hydrochloride	No	ABB.
Disopyramide phosphate	No	SRL.
Lovastatin	No	MRK.

See footnotes at end of table.

Section 6

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

<i>Medicinal chemicals</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 20)</i>
Miscellaneous medicinal chemicals—Continued		
Cardiovascular agents—Continued		
Other cardiovascular agents—Continued		
Procainamide hydrochloride	No	PD, WYK.
Propranolol hydrochloride	No	WYK.
Simvastatin	No	MRK.
Tocainide	No	MRK, SDW.
Diagnostic agents:	No	
Roentgenographic contrast media:	No	
Diatrizoate, sodium	No	SDW.
Iohexol	No	SD.
Iothalamate, meglumine	No	MAL.
Other diagnostic agents:	No	
Albumin	No	SPR.
Aminohippuric acid	No	WYK.
Edrophonium chloride	No	MRX.
Glutaryl-p-nitroaniline (liver function test)	No	REG.
Metyrapone	No	CGY.
Xylose (intestinal malabsorption test)	No	PFN.
All other diagnostic agents, other than roentgenographic contrast media	No	PFZ.
Hematological agents:	No	
Anticoagulants:	No	
Ammonium heparin	No	SPR.
Benzalkonium heparin	No	RIK.
Lithium heparin	No	SPR.
Potassium warfarin	No	(²).
Sodium heparin	No	SPR.
Warfarin	No	SDW.
Other hematological agents:	No	
Cellulose, oxidized	No	EKT.
Dextran	No	PHR.
Unclassified medicinal chemicals:	No	
Allopurinol	No	BUR.
Carbidopa	No	MRK.
Disulfiram	No	ABB.
Etidronate, disodium	No	NOR.
Levodopa	No	SRL.
Nicotine polacrilex	No	WYK.
Thuringiensin	No	ABB.
All other medicinal chemicals	No	ABB, BIB, (²).

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 20

Medicinal chemicals: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	LIL	Eli Lilly & Co., U.S. and Puerto Rico
ACY	American Cyanamid Co.	LLI	Lee Laboratories, Inc.
ADC	Anderson Development Co.	MAL	Mallinckrodt, Inc.
AJY	Ajay Chemicals, Inc.	MHI	Morton-Thiokol, Inc., Ventron Div.
AMD	Cyclo Products, Inc.	MON	Monsanto Co.
ANG	Angus Chemical Co.	MRK	Merck & Co., Inc.
ARN	Arenol Chemical Corp.	MRX	Johnson Matthey, Inc.
ARP	Armour Pharmaceutical Co.	NEP	Nepera Inc.
ARS	Arsynco, Inc.	NOR	Norwich Eaton Pharmaceutical, Inc.
BAS	BASF Corp.	NUT	Nutrilus, Inc.
BEE	Beecham, Inc.:	OH	Anaquest
	Beecham Laboratories Div.	ORG	Organics/LaGrange, Inc.
BEW	Beecham Western Hemisphere Inc.	ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.
BIB	Beckman Instruments, Inc., Splnco Div.	PD	Parke-Davis Div. of Warner-Lambert Co.
BKC	J. T. Baker Chemical Co.	PEN	Penick Corp.
BOC	Biocraft Laboratories, Inc.	PFN	Pfanstiehl Laboratories, Inc.
BOT	The Boots Company	PFZ	Pfizer, Inc. & Pfizer Pharmaceuticals, Inc.
BRS	Bristol-Myers Co.	PHR	Pharmachem Corp.
BUR	Burroughs Wellcome Co.	REG	Regis Chemical Co.
CGY	Ciba-Geigy Corp.	RIK	Riker Laboratories, Inc. Sub of 3M Co.
CHO	Ducon	RIL	Relly Industries, Inc.
CHT	Chattem, Inc.	RSA	R.S.A. Corp.
CPR	Certified Processing Corp.	SAL	Salsbury Laboratories, Inc.
DAN	Dan River, Inc., Chemical Products Div.	SCH	The Schering Corp.
DOW	Dow Chemical Co.	SD	Sterling Drug, Inc.:
DPW	Deepwater, Inc.	SD	Sterling Pharmaceuticals, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Medical Products Dept.	SDW	Sterling Organics Div.
EK	Eastman Kodak Co.:	SK	SmithKline Chemicals
EKT	Tennessee Eastman Co. Div.	SPR	Scientific Protein Laboratories
FLM	Fleming Laboratories, Inc.	SRL	G.D. Searle & Co.
GAF	GAF Corp., Chemical Group	TMH	Harcros Chemicals, Inc.
GAN	Gane's Chemicals, Inc.	TNA	Ethyl Corp.
GNF	General Foods Manufacturing Corp., Maxwell House Div.	TRD	Squibb Manufacturing, Inc.
HEX	Hexagon Laboratories, Inc.	TX	Texaco Inc., Texaco Chemical Co.
HFT	Syntex Agribusiness, Inc., Nutrition & Chemical Div.	UCC	Union Carbide Corp.
HOF	Hoffmann-LaRoche, Inc.	UPJ	Upjohn Co.
HXL	Hexcel Corp., Hexcel Chemical Products	VTM	Vitamins, Inc.
IMC	Pitman-Moore, Inc.,	WTL	Pennwalt Corp., Lucidol Div.
KAN	Kanasco, LTD	WYK	Wyckoff Chemical Co., Inc.
KLM	Kalama Chemical, Inc.	WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.
KPT	Beazer Materials & Services, Inc.		
LEM	Napp Chemicals, Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

1000 UNIVERSITY DRIVE
CHICAGO, ILL. 60607

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Section 7

Flavor and Perfume Materials

Flavor and perfume materials are organic chemicals used to impart flavors and aromas to foods, beverages, cosmetics, and soaps. These aroma chemicals are also utilized to neutralize or mask unpleasant odors in industrial processes and products, as well as in consumer products.

Total domestic production of flavor and perfume materials in 1988 amounted to 162.1 million pounds (see figure 8). Sales of these materials in 1988 amounted to 95.0 million pounds, valued at \$866.1 million, compared with 81.5 million pounds, valued at \$726.3 million, in 1987. U.S. production of flavor and perfume materials in 1988 increased by 28.5 percent from the level in 1987 while the value of sales increased by 19.3 percent.

Production of cyclic flavor and perfume materials in 1988 amounted to 78.4 million

pounds; sales amounted to 57.1 million pounds, valued at \$704.3 million. Individual publishable chemicals in the cyclic group produced in the greatest volume in 1988 were anethole (3.0 million pounds), and eugenol (410 thousand pounds).

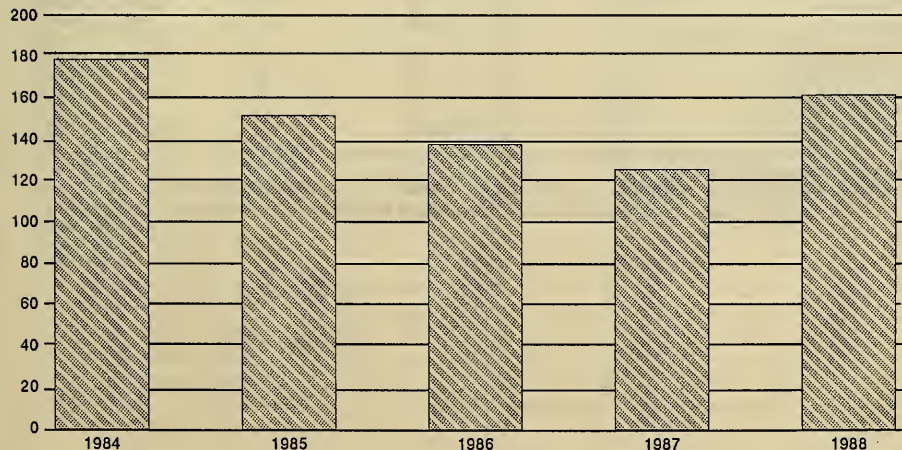
U.S. output of acyclic flavor and perfume materials in 1988 amounted to 83.7 million pounds; sales of these materials amounted to 37.9 million pounds, valued at \$161.7 million. Individual publishable acyclic flavor and perfume chemicals produced in the greatest volume in 1988 were citronellol (2.1 million pounds) and tetrahydrogeraniol (1.1 million pounds).

Table 22 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 23.

Eric Land
202-252-1349

Figure 8
Flavor and perfume materials: U.S. production, 1984-88

Millions
of pounds



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 7

Table 21
Flavor and perfume materials: U.S. production and sales, 1988

Flavor and perfume materials	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	162,086	94,980	866,095	\$9.12
Cyclic				
Total	78,378	57,060	704,353	12.34
Benzenoid and Naphthalenoid				
Total	61,096	43,343	640,188	14.77
4-Allyl-2-methoxyphenol (Eugenol)	410	195	613	3.18
Benzyl propionate	23	(²)	(²)	(²)
Phenethyl isobutyrate	18	9	56	6.24
2-Phenethyl phenylacetate	36	18	125	6.79
p-Propenylanisole (Anethole)	3,035	2,970	10,948	3.69
All other benzenoid and naphthalenoid materials	57,574	40,151	628,446	15.65
Terpenoid, Heterocyclic, and Allicyclic				
Total	17,282	13,717	64,165	4.68
Cedryl acetate	177	110	645	5.85
Ionones	133	130	1,448	11.12
Methylionones	1,254	811	7,242	8.93
α-Terpineol	2,703	3,034	2,050	.68
Vetiveryl acetate	(²)	12	619	50.93
All other terpenoid, heterocyclic, and allicyclic materials	13,015	9,620	52,161	5.42
Acyclic				
Total	83,708	37,920	161,742	4.27
Citronellyl acetate	90	58	283	4.92
Citronellyl formate	29	17	150	8.85
3,7-Dimethyl-clis-2,6-octadienol, acetate (Neryl acetate)	22	21	130	6.21
3,7-Dimethyloctanol-1 (Tetrahydrogeranol)	1,138	195	663	3.41
3,7-Dimethyl-6-octen-1-ol (Citronellol)	2,077	1,792	6,798	3.79
Ethyl hexanoate	31	21	107	5.08
Geranyl acetate	208	154	789	5.12
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	138	(²)	(²)	(²)
Isopentyl butyrate	100	87	121	1.39
Isopentyl isovalerate	30	(²)	(²)	(²)
1,3-Nonanedol acetate	35	(²)	(²)	(²)
All other acyclic materials	79,810	35,575	152,701	4.29

¹ Calculated from unrounded figures.

² Reported data are accepted in confidence and may not be published, or no data were reported.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 22

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 23)
Cyclic		
Benzenoid and naphthalenoid:		
Acetaldehyde ethyl phenethyl acetal	No	IFF.
Acetaldehyde phenethyl propyl acetal	No	IFF.
2'-Acetonaphthone (β -Methyl naphthyl ketone)	No	GIV.
1-Acetoxy-2-sec-butyl-1-ethenylcyclohexane	No	GIV.
p-Allylanisole	No	SCM, (2), (2).
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	No	CI.
4-Allyl-2-methoxyphenol (Eugenol)	Yes	BDS, CI, ELN, FB, GIV, UNG.
4-Allyl-2-methoxyphenol acetate (Eugenol acetate)	No	GIV.
Amyl cinnamic aldehyde dimethyl acetal	No	FB.
Amyl cinnamyl acetate	No	IFF.
o-Anisaldehyde (o-Methoxybenzaldehyde)	No	FB.
p-Anisaldehyde	No	FB, GIV.
Anisyl acetate	No	ELN, GIV.
Aurantol	No	BDS, FB.
Benzaldehyde glyceryl acetal	No	GIV.
Benzophenone	No	CWN, PD.
Benzyl acetate	No	FB.
Benzyl benzoate	No	KLM, MRF.
Benzyl butyrate	No	ELN, FB.
Benzyl cinnamate	No	FB.
Benzyl formate	No	FB.
Benzyl isobutyrate	No	ELN.
Benzyl isopentyl ether	No	GIV.
Benzyl isovalerate	No	ELN, FB.
1-(Benzoyloxy)-2-methoxy-4-propenylbenzene (Benzyl Isoeugenyl ether)	No	GIV.
Benzyl phenylacetate	No	ELN, GIV.
Benzyl propionate	Yes	ELN, FB, IFF.
Benzyl salicylate	No	FB.
p-tert-Butyl- α -methylhydrocinnamaledehyde	No	GIV.
N-(3-(p-tert-butylphenyl)-2-methylpropylidene)-anthranilic acid, methyl ester	No	GIV.
Carvacrol	No	GIV.
Cineole (eucalyptol)	No	SCM.
Cinnamaldehyde	No	FB.
Cinnamic aldehyde dimethyl acetal	No	CI.
Cinnamyl acetate	No	ELN, FB.
Cinnamyl alcohol	No	FB.
Cinnamyl butyrate	No	FB.
Cinnamyl cinnamate	No	FB.
Cinnamyl nitrile	No	IFF.
Cinnamyl propionate	No	ELN.
Coumarin	No	RDA.
Cuminyll acetate	No	IFF.
Cuminyll alcohol	No	GIV.
Cuminyll formate	No	IFF.
trans-Decahydro- β -naphthyl acetate	No	IFF.
2-4-Dibromo-6-nitro-m-cresyl methyl ether	No	GIV.
Dihydrocoumarin	No	ARS.
1,2-Dimethoxy-4-propenylbenzene (4-Propenylveratrole)	No	CI, FB.
β ,4-Dimethyl-3-cyclohexene-1-propanal	No	CI.
γ ,4-Dimethyl-3-cyclohexene-1-propanol	No	CI.
3,7-Dimethyl-1,6-octadien-3-yl formate	No	GIV.
3,7-Dimethyl-2,6-octadienyl phenylacetate (Geranyl phenylacetate)	No	GIV.
α , α -Dimethylphenethyl acetate	No	IFF.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 23)
Cyclic—Continued		
Benzenoid and naphthalenoid—Continued		
Dimethyl phenylethyl carbonyl acetate	No	IFF.
N-(p-Ethoxycarbonylphenyl)-N'-ethyl-N'-phenylformamide	No	GIV.
Ethyl anthranilate	No	FB, GIV.
Ethyl benzoate	No	ELN.
Ethyl cinnamate	No	ELN.
Ethyl- α , β -epoxy- β -methylhydrocinnamate	No	ELN.
2-Ethylhexyl-p-methoxy cinnamate	No	GIV.
2-Ethylhexyl salicylate	No	FB, FEL.
Ethyl phenylacetate	No	ELN.
Ethyl salicylate	No	FB.
Geranyl benzoate	No	GIV.
Hellotropyl acetate	No	IFF.
Hellotropyl acetone	No	AMB.
Hexahydro-5-methoxy-4,7-methano-1H-Indene	No	CI.
cis-3-Hexenyl salicylate	No	BDS, IFF.
α -Hexylcinnamaldehyde	No	CI.
Hydratropaldehyde	No	IFF.
Hydratropaldehyde, dimethyl acetal	No	FB, GIV, IFF.
Hydrocinnamic acid	No	ELN.
Hydrocoumarin	No	ELN, GIV.
Hydroxycitronellal methyl anthranilate	No	GIV, IFF.
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	No	RDA.
4-Hydroxy-3-methoxybenzaldehyde (Vanillin)	No	RDA.
4-(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillylacetone)	No	GIV.
p-Hydroxy phenylbutanone	No	GIV.
Isoamyl phenylacetate	No	ELN, FB.
Isobutyl phenylacetate	No	ELN, FB.
Isobutylquinoline	No	IFF.
Isobutyl salicylate	No	FB.
Isohexenyl tetrahydrobenzaldehyde (Myrac aldehyde)	No	IFF.
Isopentyl benzoate	No	GIV.
Isopentyl salicylate	No	FB.
l-Limonene	No	SCM.
Linalyl anthranilate	No	BDS.
Linalyl benzoate	No	GIV.
p-Mentha-1,8-diene (Limonene)	No	IFF.
Menthyl anthranilate	No	FB.
o-Methoxy benzaldehyde	No	CI.
p-Methoxybenzyl alcohol (Anisyl alcohol)	No	ELN, FB, GIV.
2-Methoxynaphthalene	No	GIV.
1-p-Methoxyphenyl penten-1-one-3 (α -Methyl-anisalacetone)	No	GIV.
3-(2-Methoxyphenyl)-2-propenal	No	CI.
2-Methoxy-4-propenylphenol (Isoeugenol)	No	CI.
2-Methoxy-4-propenylphenol, acetate	No	ELN.
2-Methoxy-4-propylphenol	No	CI.
4'-Methylacetophenone	No	CWN.
p-Methylanisole	No	GIV.
Methyl anthranilate	No	PSG.
β -Methylbenzene propanal	No	CI.
Methyl benzoate	No	KLM, MRF.
α -Methylbenzyl acetate (Styralyl acetate)	No	IFF.
α -Methylcinnamaldehyde	No	FB, IFF.
Methyl cinnamate	No	FB.
1,2-Methylenedioxy-4-propylene benzene (Isosafrole)	No	AMB.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to IIST in table 23)
Cyclic—Continued		
Benzenoid and naphthalenoid—Continued		
p-Methylhydratropaldehyde	No	GIV.
1-Methyl-isohexyl-hexahydro benzaldehyde	No	GIV.
Methyl-N-methylanthranilate	No	AMB.
α-Methyl-3,4-methylene dioxyhydrocinnamaldehyde	No	GIV.
Methyl phenylacetate	No	ELN, GIV.
3-Methyl-5-phenyl-1-pentanol	No	IFF.
Methyl salicylate	No	KLM, MON.
Octahydro-5-methoxy-4,7-methano-1H-indene, 2-carboxaldehyde	No	CI.
α-Pentylcinnamaldehyde	No	CI, FB.
Phenethyl acetate	No	BDS, FB, IFF.
Phenethyl alcohol	No	FB, IFF.
Phenethyl formate	No	ELN, IFF.
Phenethyl isobutyrate	Yes	ELN, FB, GIV, IFF.
Phenethyl Isovalerate	No	ELN, FB.
2-Phenethyl phenylacetate	Yes	BDS, ELN, FB, GIV, IFF.
Phenethyl propionate	No	ELN, IFF.
Phenethyl salicylate	No	GIV.
2-Phenoxyethyl isobutyrate	No	FB, IFF.
Phenoxyethyl propionate	No	FB.
Phenylacetaldehyde	No	CI, GIV.
Phenylacetaldehyde, dimethyl acetal	No	CI, ELN, GIV.
Phenylacetic acid	No	GIV.
Phenylacetic acid isopentyl ester	No	GIV.
α-Phenylanisole	No	GIV.
4-Phenyl-3-buten-2-one	No	FB.
Phenylethyl benzoate	No	IFF.
3-Phenyl-1-propanol (Hydrocinnamic alcohol)	No	FB.
3-Phenylpropyl acetate	No	ELN, FB, GIV.
3-Phenylpropyl cinnamate	No	FB.
Piperonal (Heliotropin)	No	AMB.
p-Propenylanisole (Anethole)	Yes	ARZ, FB, HPC, NCI, SCM.
p-Propylanisole (Dihydroanethole)	No	GIV.
Synthetic sweeteners:		
Cyclohexanesulfamic acid (Cyclamic acid)	No	ABB.
Cyclohexanesulfamic acid, sodium salt (Sodium cyclamate)	No	ABB.
Saccharin (1,2-Benzisothiazolin-3-one,-1, 1-dioxide)	No	PSG.
Saccharin, sodium salt	No	PSG.
All other synthetic sweetener material	No	NSW.
Tetramethyl octahydro acetophenone	No	IFF.
Tetramethyl octahydro acetyl naphthalene	No	IFF.
p-Tolualdehyde	No	GIV.
p-Tolylacetaldehyde	No	GIV.
p-Tolylacetate	No	ELN.
p-Tolylisobutyrate	No	IFF.
p-Tolyl octanoate	No	IFF.
p-Tolylphenylacetate	No	GIV.
α-(Trichloromethyl)benzyl acetate (Rosetone)	No	ARS.
Trimethyl benzyl dioxane	No	IFF.
Trimethylcyclohexyl salicylate	No	ARS.
Vanillin propylene glycol acetal	No	FB.
All other benzenoid or naphthalenoid chemicals	No	FB, IFF, TMH.
Terpenoid, heterocyclic, and alicyclic:		
Acetyl-n-butyl (2,3-Hexanedione)	No	FB.
Acetyl cedrene (Vertoflex)	No	BDS.
Acetyl isovaleryl (5-Methyl-2,3-hexanedione)	No	FB.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 23)
Cyclic—Continued		
Terpenoid, heterocyclic, and alicyclic—Continued		
N-Acetyl methyl anthranilate	No	AMB.
Acetyl propionyl (2,3-Pentanedione)	No	FB.
Allo-ocimene	No	SCM, (2), (2).
Allyl cyclohexyl propionate	No	GIV.
Amyl cyclohexyl acetate	No	IFF.
Amyris acetate	No	GIV.
Beta methyl ionone coeur	No	IFF.
2-tert-Butyl cyclohexanol	No	IFF.
2-sec-Butylcyclohexanone	No	GIV.
o-tert-Butylcyclohexyl acetate	No	CI, IFF.
p-tert-Butylcyclohexyl acetate (Verbenax)	No	IFF.
Canrenoate, potassium salt	No	IFF.
l-Carvone	No	SCM.
β-Caryophyllene	No	BDS, FB, GIV.
α-Cedrene epoxide (Andrane)	No	BDS, IFF.
Cedrenol	No	ELN, IFF.
Cedrol	No	ELN.
Cedryl acetate	Yes	BDS, ELN, IFF.
Cedryl formate	No	IFF.
Cyclohexyl salicylate	No	FB.
Cyclopentanone	No	FB.
Dihydrondicyclopentadienyl acetate (Cyclacet)	No	BDS, CI.
Dihydrondicyclopentadienyl propionate (Cyclaprop) (Verdyl propionate extra)	No	BDS, CI.
Dihydro terpineol	No	IFF, NCI, SCM.
2, 6-Dimethylheptan-2-ol	No	GIV.
Ethyl furoate	No	IFF, SCM.
4-Ethyl gualacol	No	STG.
Galaxolide (1, 3, 4, 6, 7, 8-Hexahydro-4, 6, 6, 7, 8, 8-hexamethyl-cyclopenta-2-benzopyran)	No	IFF.
Gualacwood acetate	No	ELN, FB.
Gualene	No	FB.
2-Heptylcyclopentanone	No	IFF.
Hexadecanolide	No	IFF.
3-Hydroxy-2-ethyl-4-pyrone (Ethylmaltol)	No	PFZ.
4-(4-Hydroxy-4-methyl pentyl)-3-cyclohexene-10-carboxaldehyde (Lyral)	No	IFF.
3-Hydroxy-2-methyl-4-pyrone (Maltol)	No	PFZ.
4-Hydroxynonanlc acid, γ-lactone (γ-Nonalactone)	No	ELN.
4-Hydroxyundecanoic acid, γ-lactone (γ-Undecalactone)	No	ELN.
Ionone (α- and β-)	No	GIV, NCI.
α-Ionone	No	BDS, GIV, IFF.
β-Ionone	No	BDS, IFF.
Isobornyl acetate	No	SCM.
Isobornyl methyl ether	No	SCM.
Isobornyl propionate	No	ELN.
Isojasmone	No	FB.
Isolongifolene epoxide	No	GIV.
Isomenthone	No	GIV.
2-Isopropylcyclohexanol	No	GIV.
6-Isopropyldecalone	No	GIV.
Isopulegyl acetate	No	GIV.
p-Mentha-1,3-diene (α-Terpinene)	No	SCM.
p-Mentha-1,4-diene (γ-Terpinene)	No	SCM.
p-Mentha-6,8-dien-α-ol (Carveol)	No	FB.
p-Mentha-6,8-dien-α-one (Carvone, Carvol)	No	FB.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 23)
Cyclic—Continued		
Terpenoid, heterocyclic, and alicyclic—Continued		
1-p-Mentha-6,8-dien-2-yl acetate (Carvyl acetate)	No	FB.
p-Menth-8-en-3-ol (Isopulegol)	No	GIV.
p-Menth-1-en-3-one (Piperitone)	No	GIV.
p-Menth-4-(8)-en-3-one (Pulegone)	No	GIV.
1-1-p-Menthen-6-yl-1-propanone	No	GIV.
d,l-Menthol, synthetic	No	GIV, HAR, IFF, SCM.
l-Menthol, synthetic	No	HAR.
Menthyl acetate	No	GIV.
l-Menthyl acetate	No	SCM.
α -Methylcyclohexanemethanol	No	CI.
Methylionone (α - and β -)	No	BDS, GIV, IFF.
γ -Methylionone	No	GIV, IFF.
6-Methyl- α -ionone	No	BDS, FB, GIV.
Nopol	No	IFF, NCI.
Nopyl acetate	No	IFF.
para-Cymene	No	SCM.
1-Phenylsal-1,2-propanedione	No	STG.
Plinyl acetate	No	SCM.
Propyl furylacrylate	No	AMB.
Rose oxide	No	FB.
α -Santalyl acetate	No	GIV.
Terpinene-ol	No	SCM.
α -Terpineol	Yes	HPC, IFF, SCM.
α -Terpinyl acetate	No	IFF, SCM.
α -Terpinyl propionate	No	ELN.
3,3,5-Trimethyl cyclohexanol (m-Homomenthol)	No	ARS.
Trimethyl cyclohexenyl butenone	No	IFF.
1-(2,6,6-Trimethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one (Allyl- α -ionone)	No	IFF.
Trimethyl norbornane methanol	No	IFF.
$\alpha,\alpha,5$ -Trimethyl-5-vinyl-furfuryl alcohol and tetrahydro-2,2,6-trimethyl-6-vinyl-3-ol	No	GIV.
5-(2,2,3-Trimethylcyclopent-3-en-1-yl)-3-methylpentan-2-ol	No	GIV.
Vetivenol	No	GIV.
Vetivenyl acetate	Yes	BDS, ELN, GIV.
All other terpenoid, heterocyclic, or alicyclic flavor and perfume chemicals	No	CI, GPI, IFF, SCM, STG.
Acyclic:		
Allyl disulfide	No	IFF.
Allyl heptanoate	No	ELN, FB.
Allyl hexanoate	No	ELN, FB.
Ammonium isovalerate	No	RSA.
Butanoic acid, 1-cyclohexylethyl ester	No	CI.
Butyl butyrate	No	AMB.
Butyl butyryl lactate	No	ELN, FB.
Butyl undecylenate	No	FB.
Butyraldehyde diethyl acetal	No	FB.
Citral dimethyl acetal	No	IFF.
Citronellyl acetate	Yes	BDS, ELN, FB, GIV, IFF, SCM.
Citronellyl formate	Yes	BDS, ELN, GIV, IFF.
Citronellyl isobutyrate	No	ELN, GIV, IFF.
Citronellyl propionate	No	IFF.
Crude acetate mixture (linalyl, neryl, geranyl acetates main components)	No	(²).

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 23)
Acyclic—Continued		
Decanal (Capraldehyde)	No	CI.
Decyl acetate	No	GIV.
Diethyl sebacate	No	ELN.
Diethyl succinate	No	MRF.
Dihexyl fumarate	No	FB.
Dihydrocarvone	No	SCM.
Dihydrolinalool	No	SCM.
Dihydromyrcenol	No	SCM, (2), (2).
Dihydro pentamethyl Indanone	No	IFF.
Dihydroterphenyl acetate	No	IFF, NCI.
1,1-Dimethoxy octane	No	IFF.
4-(1,1-Dimethylethyl) cyclohexanol	No	CI.
2,6 Dimethyl-5-hepten-1-al	No	GIV.
Dimethyl hexanediol	No	(2).
2,5-Dimethyl-3-hexyne-2,5-diol	No	(2).
3,7-Dimethyl-trans-2,6-octadienal (Citral A, Geranial)	No	BDS.
3,7-Dimethyl-2,6-octadienal (Citral a & b)	No	NCI, SCM.
3,7-Dimethyl-2,6-octadienenitrile	No	CI.
3,7-Dimethyl-2,6-octadiene oxime	No	CI.
3,7-Dimethyl-cis-2,6-octadien-1-ol (Nerol)	No	ELN, FB, GIV, NCI, SCM.
3,7-Dimethyl-trans-2,6-octadien-1-ol (Geraniol)	No	ELN, FEL, GIV, IFF, NCI, SCM.
3,7-Dimethyl-1,6-octadien-3-ol (Linalool) (Linalyl alcohol)	No	IFF, SCM.
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	Yes	ELN, GIV, SCM.
3,7-Dimethyl-1,6-octadien-3-ol, acetate (Linalyl acetate)	No	GIV, SCM.
3,7-Dimethyl-1,6-octadien-3-yl isobutyrate (Linalyl isobutyrate)	No	GIV.
3,7-Dimethyl-1,6-octadien-3-yl propionate (Linalyl propionate)	No	GIV.
Dimethyloctanal	No	GIV, SCM.
3,7-Dimethyloctanol-1 (Tetrahydrogeraniol)	Yes	GIV, IFF, NCI, SCM.
3,7-Dimethyl-3-octanol	No	FB, SCM.
Dimethyloctanyl acetate	No	GIV, IFF.
3,7-Dimethyl-6-octen-1-al (Citronellal)	No	GIV, SCM.
3,7-Dimethyl-6-octenenitrile	No	CI.
3,7-Dimethyl-6-octene oxime	No	CI.
3,7-Dimethyl-6-octen-1-ol (Citronellol)	Yes	ELN, FB, GIV, IFF, NCI, SCM.
3,7-Dimethyl-7-octenol 70%, 6-octenol isomer 30%	No	GIV.
Dimethyl succinate	No	FB.
Dodecane nitrile	No	IFF.
Ethyl butyrate	No	FB, HPC, NW.
Ethyl caprate	No	FB.
Ethyl formate	No	FB.
Ethyl heptanoate	No	ELN, FB, FEL.
Ethyl hexanoate	Yes	ELN, FB, NW.
Ethyl isobutyrate	No	FB.
Ethyl isovalerate	No	ELN.
Ethyl laurate	No	ELN, FB.
Ethyl-2-methyl butyrate	No	FB.
Ethyl-2 methyl pentanoate	No	HPC.
Ethyl myristate	No	ELN.
Ethyl nonanoate	No	FB.
Ethyl octanoate	No	FB.
Ethyl propionate	No	FB, MRF, NW.
Ethyl trimethyl cyclopentyl buterol	No	IFF.
Ethyl valerate	No	ELN.
Geranyl acetate	Yes	BDS, CI, ELN, FB, FEL, GIV, IFF, NCI, SCM.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 23)
Acyclic—Continued		
Geranyl butyrate	No	BDS, ELN, GIV.
Geranyl crotonate	No	FB.
Geranyl ethyl ether	No	IFF.
Geranyl formate	No	ELN, GIV.
Geranyl isobutyrate	No	IFF.
Geranyl isovalerate	No	FB.
Geranyl nitrile (Citralva)	No	IFF.
Geranyl propionate	No	FB.
Geranyl tiglate	No	FB.
Heptanolde	No	FB.
N-Hexanal	No	CI.
2-Hexenal	No	FB, GIV.
2-Hexenol	No	FB.
cis-3-Hexen-1-yl acetate	No	BDS, GIV, IFF.
cis-3-Hexenyl butyrate	No	IFF, SCM.
cis-3-Hexenyl methyl carbonate	No	IFF.
cis-3-Hexenyl tiglate	No	BDS.
Hexoxyacetaldehyde dimethyl acetal	No	FB.
Hexyl acetate	No	FB.
Hexyl caproate	No	FB.
Hexyl 2-methylbutyrate	No	SCM.
Hydroxycitronellol	No	SCM.
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	Yes	GIV, IFF, SCM.
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (Hydroxycitronellal, dimethyl acetal)	No	GIV.
Hydroxy-2-propanone (Acetol)	No	FB.
Isoamyl caproate	No	FB.
Isoamyl caprylate	No	FB.
Isoamyl propionate	No	FB.
Isobutyl acetate	No	FB, NW.
Isobutyl-2-butenolate	No	AMB.
Isobutyl butyrate	No	FB.
Isopentyl acetate (Isoamyl acetate)	No	ELN, FB.
Isopentyl butyrate	Yes	FB, GIV, NW.
Isopentyl formate	No	ELN, FB.
Isopentyl isovalerate	Yes	ELN, FB, HPC.
Lauraldehyde	No	GIV, SCM.
3-Methyl-2-butenyl acetate	No	IFF.
3-Methyl butyl butyrate	No	FB.
2-Methylbutyl isovalerate	No	SCM.
Methyl butynol	No	(²).
2-Methyldecanal	No	CI.
2-Methylene undecanal	No	CI.
Methyl hexyl ether	No	SCM.
Methyl isobutyrate	No	HPC.
Methyl isovalerate	No	FB.
Methyl-2-methyl butyrate	No	SCM.
3-Methyl-2-[and 3]nonene nitrile	No	GIV.
Methylol methyl hexyl ketone	No	GIV.
Methyl pentynol	No	(²).
Methyl propionate	No	FB.
2-Methylundecanal	No	CI, GIV.
Myrcenyl acetate	No	IFF.
Myristaldehyde	No	GIV.
Nonanal	No	CI.
1,3-Nonanediol acetate	Yes	ELN, GIV, SBC.
Nonanol	No	GIV.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 23)
Acyclic—Continued		
Ocimene	No	IFF.
Ocimenyl acetate	No	IFF.
Octanal	No	Cl.
3-Octanone (Ethyl amyl ketone)	No	GIV.
N-Octyl acetate	No	FB, SCM.
Octyl formate	No	FB.
Octyl isobutyrate	No	FB.
Octyl isovalerate	No	GIV.
Pseudo linalyl acetate (Neobergamate)	No	IFF.
Rhodinol	No	GIV, IFF.
Tepyl acetate	No	ELN.
Tetrahydro-allocimerol (50/50 mixture of tetrahydro-linalool and tetrahydro-myrcenol)	No	(²).
Tetrahydromyrcenol	No	SCM.
Trimethyl-cyclododeca-trienyl ethanone	No	IFF.
3,5,5-Trimethyl hexanal	No	IFF.
Undecanal	No	Cl, GIV.
9-Undecenal	No	GIV.
All other acyclic flavor and perfume materials	No	FB, IFF, SCM, SK, (²).

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 23

Flavor and perfume materials: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	NCI	Union Camp Corp., Terpene and Aromatics Div.
AMB	American Bio-Synthetics Corp.	NSW	Nutrasweet Co.
ARS	Arsynco, Inc.	NW	Northwestern Chemical Co.
ARZ	Arizona Chemical Co.	PD	Parke-Davis, Div. of Warner-Lambert Co.
BDS	Fragrance Resources, Inc.	PFZ	Pfizer, Inc.
CI	Firmenich, Inc.	PSG	PMC Specialties Group, Inc.
CWN	Upjohn Co., Fine Chemical	RDA	Rhone-Poulenc, Inc.
ELN	Elan Chemical Co.	RSA	RSA Corp.
FB	Fritzsche Dodge & Olcott, Inc.	SBC	Scher Chemicals, Inc.
FEL	Felton International, Inc.	SCM	SCM Gildco Organics
GIV	Givaudan Corp.	SK	Smithkline Chemicals
GPI	Grindsted Products, Inc.	STG	McCormick & Co., Inc. McCormick-Stange Flavor Div.
HAR	Haarmann & Reimer Corp.	TMH	Harcros Chemicals, Inc.
HPC	Hercules, Inc.	UNG	Ungerer & Co.
IFF	International Flavors & Fragrances, Inc.		
KLM	Kalama Chemical, Inc.		
MON	Monsanto Co.		
MRF	Morflex Chemical Co., Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

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Section 8

Plastic and Resin Materials

Plastics and resin materials are high molecular weight polymers which, at some stage in their manufacture, exist in such physical condition that they can be shaped or otherwise processed by the application of heat and pressure. The terms "plastics," "resin," and "polymers," can be (and often are) used interchangeably by the trade. Depending on the chemical composition, manufacturing process, or intended use, the commercial products may contain plasticizers, fillers, extenders, stabilizers, coloring agents, or other additives. There are about 40 to 50 basic plastics and resins which are available commercially. These basic materials are available in literally thousands of individual compounds each with its distinct properties depending on the molecular weight of the resin and the types and amounts of the additives present. Plastics materials may be molded, cast, or extruded into semifinished or finished solid forms. Resin materials may be in the form of solutions, pastes, or emulsions for applications such as protective coatings, adhesives, or paper and textile treatment.

Statistics on U.S. production and sales of synthetic plastics and resin materials for 1988 are given in table 24. U.S. production of plastics and resin materials in 1988 totaled 63,536 million pounds, or 6.8 percent more than the 59,481 million pounds produced in 1987. From 1984-88, the production of plastics and resin materials increased steadily from 48,255 million pounds in 1984 to 63,536 million pounds in 1988, or at an average, annual rate of growth of 7.1 percent (see figure 9). Sales in 1988 totaled 55,240 million pounds, valued at \$33,831 million,

compared with 51,170 million pounds, valued at \$26,068 million, in 1987.

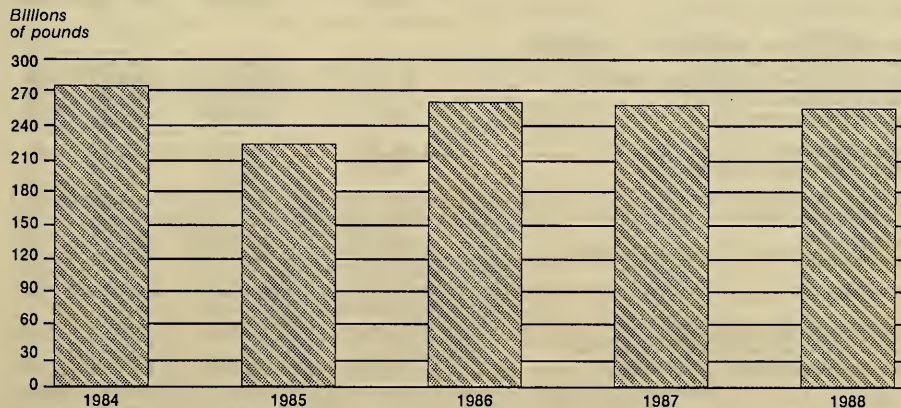
Thermosetting materials are those which harden with a change in composition in the final treatment so that in their final state as finished articles they are substantially infusible and insoluble; that is, they cannot again be softened by heat or solvents. U.S. production of thermosetting materials totaled 9,593 million pounds in 1988, compared with 8,923 million pounds in 1987. Production of the most important products in 1987 included phenolic (1,687 million pounds), amino (urea and melamine) resins (2,755 million pounds), polyester resins, unsaturated (1,477 million pounds), and alkyd resins (760 million pounds).

Thermoplastic materials are those which in their final state as finished articles can be repeatedly softened by heat and hardened by a decrease in temperature. U.S. production of thermoplastic materials totaled 53,942 million pounds in 1988 (or 84.9 percent of the total plastics and resin materials output for 1988), compared with 50,558 million pounds in 1987. Production of the most important products in 1988 included polyethylene (19,357 million pounds), polypropylene (7,257 million pounds), vinyl resins (10,357 million pounds), and styrene type materials (9,185 million pounds). In 1988, production of saturated polyester resins reached 2,760 million pounds (polyethylene terephthalate alone reached 2,110 million pounds). Production of engineering plastics, in the aggregate, amounted to 1,491 million pounds in 1988.

Table 25 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 26.

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202-252-1362

Figure 9
Plastics and resin materials: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 8

Table 24
 Plastics and resin materials: U.S. Production and sales, 1988

Plastics and resin materials	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds dry basis ²	1,000 pounds dry basis ²	1,000 dollars	Per pound
Grand total	63,536,140	55,240,240	33,831,291	\$0.61
Thermosetting resins				
Total	9,593,400	7,909,139	4,079,722	.52
Alkyd resins, total	760,216	505,123	297,306	.59
Phthalic anhydride type	614,653	441,584	246,197	.56
Polybasic acid type	32,652	16,263	12,674	.78
Styrenated-alkyds or copolymer alkyds	18,971	8,630	7,284	.84
Vinyl toluene alkyds	29,038	25,992	19,206	.74
All other alkyd resins	64,902	12,654	11,945	.94
Dicyandiamide resins (an amino resin)	1,977	2,314	2,670	1.15
Epoxy resins: ^{3 4}				
Unmodified	567,178	419,461	434,777	1.02
Advanced	(376,328)	(270,669)	(364,612)	(1.35)
Furfuryl type resins	19,240	19,171	12,916	.67
Glyoxal-formaldehyde resins	15,431	11,360	12,683	1.12
Melamine-formaldehyde resins (an amino resin)	252,628	214,052	192,428	.90
Phenolic and other tar acid resins	1,687,318	1,163,568	673,490	.58
Polyester resins, unsaturated ⁵	1,477,027	1,408,600	841,736	.60
Polyether and polyester polyols for urethanes ⁶	1,872,193	1,627,468	893,624	.55
Polyurethane elastomers and plastics products, total	273,029	204,072	324,168	1.59
Elastomers ⁷	112,774	101,662	201,222	1.98
Plastics	160,255	102,410	122,946	1.20
Urea-formaldehyde resins (an amino resin) ⁸	2,501,953	2,193,507	249,767	.11
All other thermosetting resins ⁹	165,210	140,443	144,157	1.03
Thermoplastic resins				
Total	53,942,740	47,331,101	29,751,569	.63
Acrylic resins, total ¹⁰	1,649,859	1,289,360	1,501,833	1.16
Homopolymer resins, except PMMA, of acrylic or methacrylic acid esters	43,953	34,479	39,679	1.15
Polyethyl methacrylate (PMMA) resins	651,522	400,871	419,327	1.05
Thermosetting acrylic resins	119,695	43,034	48,949	1.14
All other acrylic resins	834,689	810,976	993,878	1.23
Engineering plastics ¹¹	1,491,228	1,219,247	2,285,564	1.87
Petroleum hydrocarbons resins	384,036	346,896	161,470	.47
Polyamide resins, total	655,642	582,935	840,279	1.44
Nylon type ^{10 12}	581,061	537,068	802,367	1.49
Non-nylon type	74,581	45,867	37,912	.83
Polyester resins, saturated, total ^{10 13}	2,759,815	1,913,285	1,716,202	.90
Polyethylene terephthalate (PET)	2,110,103	1,379,788	1,025,663	.74
All other saturated polyesters, including Polybutylene terephthalate, (PBT) resins	649,712	533,497	690,539	1.29

See footnotes at end of table.

Table 24

Plastics and resin materials: U.S. Production and sales, 1988

Plastics and resin materials	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds dry basis ²	1,000 pounds dry basis ²	1,000 dollars	Per pound
Thermoplastics resins—Continued				
Polyethylene resins, total	19,357,246	18,282,719	8,905,951	\$0.49
Ethylene-vinyl acetate and other copolymer resins	662,919	587,858	360,541	.61
Specific gravity 0.940 and below, total ⁴	9,779,232	9,013,356	4,461,044	.49
Low density polyethylene (LDPE) resins	8,197,576	7,623,580	3,818,093	.50
Linear low density polyethylene (LLDPE) resins	1,581,656	1,389,776	642,951	.46
Specific gravity over 0.940	8,915,095	8,681,505	4,084,366	.47
Polypropylene resins	7,256,768	5,896,665	2,819,374	.48
Polyterpene resins	56,427	49,965	41,007	.82
Polytetrafluoroethylene (PTFE) resins	18,095	24,604	141,645	5.76
Rosin modifications, total	325,092	286,419	157,050	.55
Modified rosin (unesterified)	167,196	135,166	49,517	.37
Modified rosin esters	118,612	112,554	83,822	.74
Rosin esters, unmodified (Ester gums)	39,284	38,699	23,711	.61
Styrene plastics materials, total	9,184,926	7,808,080	6,083,103	.78
Acrylonitrile-butadiene-styrene terpolymer (ABS) resins	1,929,284	1,860,178	1,713,025	.92
Methyl methacrylate-butadiene-styrene (MBS) resins and certain other styrene type plastics materials	52,299	43,538	55,739	1.28
Polystyrene homopolymers, total	5,797,121	4,761,269	2,882,349	.61
Expandable polystyrene beads	551,150	554,640	370,750	.67
Rubber modified polystyrene	2,057,410	1,962,063	1,214,680	.62
Straight polystyrene	3,188,561	2,244,566	1,296,919	.58
Styrene latexes, total	780,527	754,217	477,322	.63
Styrene-butadiene latexes	561,135	534,398	337,567	.63
All other styrene latexes	219,392	219,819	139,755	.64
All other styrene plastics materials ¹⁵	625,695	388,878	954,668	2.45
Vinyl resins, total ¹⁶	10,357,030	9,349,567	4,524,914	.48
Polyvinyl acetate ¹⁷	675,099	650,203	355,506	.55
Polyvinyl chloride and copolymers	8,588,205	7,798,405	3,224,604	.41
Polyvinylidene chloride resins, latex type	24,998	20,698	18,695	.90
Vinyl acetate-acrylate copolymers	521,443	497,294	214,296	.43
All other vinyl and vinylidene resins ¹⁸	547,285	382,967	711,813	1.86
All other thermoplastic resins ¹⁹	446,576	281,359	573,177	2.04

¹ Calculated from unrounded figures.² Dry weight basis unless otherwise specified. Dry weight basis is the total weight of the materials including resin and coloring agents, extenders, fillers, plasticizers, and other additives, but excluding water and other liquid diluents unless they are an integral part of the materials.³ Includes reactive diluents which are an integral part of the resin. Excludes the weight of hardeners sold in association with the resin as part of a two-component system.⁴ Data shown for advanced epoxy resins are that part of the unmodified epoxy resins which is further processed; therefore, the total in parentheses are not included in the grand total.⁵ Polyester resins are unsaturated alkyd resins, later to be copolymerized with a monomer (Such as styrene or methyl methacrylate), and polyallyl resins (such as diallyl phthalate and diglycol carbonate). Data are on an "as sold" basis, including monomer if part of the resin system.⁶ In addition to the polyols, the other principal starting materials used in the production of urethane products are the isocyanic acid derivatives, mainly the 80/20 mixture of toluene-2,4- and 2,6-dilsoocyanate.

Statistics for the isocyanic acid derivatives are reported in the "Cyclic Intermediates" section of the Synthetic Organic Chemicals report.

Footnotes for table 24—Continued

⁷ The data on urethane elastomers are believed to be not fully representative of the total urethane market in view of the very large number of urethane elastomer producers. The commission has begun reporting statistics for urethane elastomers in two sections, section VIII, plastics and resin materials, and section X, elastomers (synthetic rubber). Henceforth those polyurethane products classified as "thermoplastic" urethane elastomers will be reported in SOC section X; all other urethane elastomers will remain in SOC section VIII.

⁸ Includes thiourea resins.

⁹ Includes acetone-formaldehyde resins, polybutadiene resins, silicone resins, and certain other thermosetting resins.

¹⁰ Does not include production or sales for fiber use.

¹¹ Engineering plastics: Includes acetal, polycarbonate, polyimide and amide-imide polymers, polyphenylene oxide, polyphenylene sulfide and polysulfone. Engineering plastics are defined in *Whittington's Dictionary of Plastics*, as "All plastics, with or without fillers or reinforcements, which have mechanical, chemical and thermal properties suitable for use in construction, machine components and chemical processing equipment." The above list of plastics (all of which are thermoplastic) was selected from a larger group in this source. Certain other plastics named in Whittington's Dictionary as engineering plastics, such as ABS resins, acrylic resins, and nylon resins, are not included in the above list as they are published separately.

¹² Statistics for nylon 6 and nylon 6/6 which are used in plastics applications (e.g., molding, etc.) are included here.

¹³ Statistics are included here for polyethylene terephthalate used in plastics applications (e.g., molding, etc.)

Statistics also are included here for production only when the starting materials are converted directly to a finished product (i.e., "in situ" production); polyester film and tape are examples of such a conversion.

¹⁴ Data shown for LLDPE resins are incomplete because several of the leading producers of LLDPE still continue to aggregate these data with that of LDPE.

¹⁵ Includes data for α -methyl styrene polymers, styrene acrylonitrile (SAN) copolymer resins, styrene-allyl alcohol copolymer resins, styrene-divinylbenzene copolymer resins, styrene-maleic anhydride copolymers resins and styrene-methyl methacrylate copolymers resins, and other styrene resins.

¹⁶ Data are on the basis of dry resin content, excluding the weight of plasticizers, extenders, fillers coloring agents, stabilizers, or impact modifiers, unless otherwise noted.

¹⁷ Data for polyvinyl acetate produced and sold in latex form includes the weight of any protective colloids which are used as emulsion stabilizers and form an integral part of the resin system. Production and sales do not include polyvinyl acetate used as a reactive intermediate for polyvinyl alcohol or other vinyl resins.

¹⁸ Includes polyvinyl alcohol, polyvinyl butyral, polyvinyl formal, polyvinylidene chloride (solid type), and other vinyl resins.

¹⁹ Includes cellulose plastics, coumarone-indene resins, fluorocarbon resins, (except PTFE), phenoxy resins, polybutylene type resins, polyphenyl aromatic ester resins, and certain other thermoplastic materials.

Note.—Data reported to the U.S. International Trade Commission do not necessarily coincide with that reported to the Society of the Plastics Industry (SPI) because of differences in both the reporting instructions and in the coverage of certain resins.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 25

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Plastics and resin materials</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermosetting resins:		
Acetone-formaldehyde resins	No	ACY, FJI, FLH, GP.
Alkyd resins:	Yes	
Acrylate-alkyd copolymer resins	No	CPV, DRR, FJI, FRE, GLD, JOB, MNP, OBC, PPG, REL, SW.
Alkyl phenol	No	(²).
Phthalic anhydride type alkyd resins	Yes	ACO, ACY, ASH, BAL, BLC, BRU, CCC, CGL, CJO, CPV, DRC, DSO, DUP, EW, FOC, FRE, GGI, GLD, GRG, GRV, HAN, HIL, ICF, JOB, JSC, LIC, MCC, MNP, NCP, NTL, OBC, PER, PPG, PRT, QCP, RCI, REL, REZ, SRY, SW, TNA, UNO, (²), (²), (²).
Polybasic acid type alkyd resins	Yes	ACY, CJO, CPV, DSO, FOC, GGI, GLD, HAN, ICF, IOV, JOB, MCC, NTL, OBC, PPG, RCI, REL, SCN, SW.
Styrenated-alkyds, or copolymer alkyds	Yes	BLC, CJO, CPV, DSO, EW, FRE, GGI, GLD, MNP, MRT, NTL, OBC, REL, RUO, SW.
Vinyl toluene alkyds	Yes	BLC, CGL, CJO, CPV, FJI, FRE, GGI, GLD, JOB, MCC, MNP, PRT, SW.
All other alkyd copolymers	No	CGL, CJO, MCC, MNP, OBC, REL, SW, (²), (²).
Amino resins:		
Melamine-formaldehyde resins	Yes	AUX, BOR, CBD, CGL, CPV, DGO, GRG, HCL, JSC, MNP, MON, OCF, PLS, PMC, PPG, PPL, PST, RCI, REL, REZ, SQA, UTC, WRD.
Thiourea resins	No	CMP.
Urea-formaldehyde resins	Yes	ACR, ACY, AIP, AUX, BOR, CBD, CGL, CMP, CPV, DAN, DSO, GP, GRV, JSC, MMM, PMC, PST, REL, REZ, SAC, SOR, SQA, WPG.
Dicyandiamide resins	Yes	CMP, ECC, HCL, JSC, S, SQA, UTC.
Epoxy resins:		
Epoxy, resins advanced	Yes	ASL, CGL, CGY, CJO, CNI, CPV, DOW, DSO, DUP, EW, GE, GLD, GRG, GRV, HAN, HXL, ICF, MCC, MID, MNP, MRT, OCF, PPG, QUN, RCI, REZ, SCN, SMO, WLN.
Epoxy, resins unmodified	Yes	AGI, ASH, CGY, CLU, DOW, JOB, PRT, RCI, REZ, SHC, UCC, (²).
Furfuryl type resins	Yes	ACR, CLU, DRR, HVG, UNO, WRD.
Glyoxal-formaldehyde resins	Yes	AIP, AUX, CMP, HCL, RBI, RTC, SQA.
Phenolic and other tar acid resins	Yes	ACR, ACY, ADC, ASH, BME, BOR, BSC, BTL, BUC, CBD, CLU, CPV, DRR, DSO, EW, GE, GGI, GP, HCL, HER, HKD, HPC, HVG, ICF, IRI, KPT, LII, MCA, MID, MMM, NCI, NTC, NTL, OBC, OCF, PLS, PPL, PSG, RCI, SPL, SW, UCC, UNO, USR, VSV, WCA, WRD, (²), (²), (²).
Polybutadiene resins	No	CCS, CNI, CRS, LC, PSL, SCN.
Polyester resins, unsaturated, and allyl resins:	Yes	
Allyl resins	No	CMC, FMC, MCC.
Diallyl isophthalate	No	CMC, FMC.
Polyester resins, unsaturated	No	ACR, ACY, ADC, APH, ART, ASH, CGL, CPV, DSO, EW, FJI, FRE, GLD, GRG, ICF, ICI, IPC, KPT, LII, MCC, MRT, NCP, OCF, PPG, PPL, RCI, SHX, SIC, SLC.

See footnotes at end of table.

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Plastics and resin materials</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermosetting resins—Continued		
Polyether and polyester polyols for urethanes	Yes	ARK, BAS, BMC, BPT, CHC, CXI, DOW, DSO, FRE, GRG, JOB, MCC, MOB, MRT, NTL, OCF, OMC, PPG, RCI, RUO, UCC, WM.
Polyurethane elastomer and plastic products:		
Polyurethane elastomers	Yes	ACY, ADC, ARO, BAS, BPT, CAS, CGY, CNI, DCC, DNS, EPI, GLC, GRD, HXL, HYA, INP, MRT, PLN, PPG, PRC, RUO, SBG, SLC, SMO, USM, USR.
Polyurethane resins	Yes	ARO, CGL, DSO, DUP, EW, FRE, GGI, GLD, HYC, INP, LC, MCC, MID, MOB, OMC, PEL, RBI, SCN, SHX, SIF, SW, CJO, DCC, MCC, PEL, SPD.
Silicone resins	No	
All other thermosetting resins	Yes	
Thermoplastic resins:		
Acrylic resins:		
Copolymer resins of acrylic and/or methacrylic acid resins:	Yes	
Butyl acrylate ethyl acrylate copolymer resins	No	AIP, BFG, DSO, ICI, RH, UOC.
Butyl methacrylate-ethyl methylacrylate copolymer resins	No	UOC.
2-Ethylhexyl acrylate-methyl acrylate copolymer resins	No	AIP, RH, UOC.
Lauryl methacrylate-stearyl methacrylate copolymer resins	No	ICI.
Other copolymer resins of acrylic and/or methacrylic acid esters	No	ACO, AIP, BPT, CHP, CPV, DRB, DRC, DSO, FLH, GAF, GGI(E), GLD, ICF, ICI, JNS, JSC, KMP, MCC, MON, NSC, PPG, PRA, PYI, REL, RH, SW, SYT, UCC, (?).
Homopolymer resins of acrylic and/or methacrylic acid resins:		
Other homopolymer resins of acrylic and/or methacrylic acid esters	Yes	CPV, DUP, GRV, ICF, PYI, RH, SAR, SW, UOC.
Polymethyl methacrylate (PMMA)	Yes	ACY, ART, CTP, CYR, DUP, ICF, JOB, JSC, MRT, PKL, RH, SAR, SQA.
Thermosetting acrylate resins	Yes	CPV, DRC, DSO, DUP, GRV, HAN, ICF, MID, PPG, PRA, REZ, SM.
Cellulose plastics and resins:		
Cellulose acetate	No	EKT.
Cellulose acetate butyrate	No	EKT.
Cellulose acetate propionate	No	EKT.
Ethyl cellulose	No	(?)
Cellulose plastics, all other	No	EKT.
Coumarone-Indene resins	No	CPV.
Engineering plastics:		
Acetal resins	No	DUP, HCL, MCC, PRT, RAS.
Polycarbonate resins	No	DOW, GE, GEP, MOB, SQA.
Polyimides and amide-imide polymers	No	DUP, EW, GE, GEP, GRG, PDI, TNA.
Polyphenylene oxide type resins	No	GE, GEP, JOB.
Polyphenylene sulfide resins	No	PLC.
Fluorocarbon resins:		
Ethylene/chlorotrifluoro ethylene copolymer (Halar) ...	No	AUS.
Polytetrafluoroethylene (PTFE)	Yes	AUS, DUP, ICI.
Polyvinylidene fluoride resin	No	PAS.
All other fluorocarbon resins	No	AUS, DUP.
Petroleum hydrocarbon resins	No	CFX, CXI, EKX, ENJ, GYR, HPC, ICF, LII, NEV, RCI, (?)

See footnotes at end of table.

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Plastics and resin materials</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermoplastic resins—Continued		
Phenoxy (R) resin (other than for coating and adhesives)	No	NEV, UCC.
Plastics alloys or blends	No	MOB.
Polyamide resins:	Yes	
Non-nylon type, polyamide resins	Yes	COO, EFH, GP, HCL, HYA, LII, NCI, PAC, S, SHX, SQA, USM.
Nylon type, polyamide resins	Yes	ACS, AGI, BCM, CTR, DGO, DUP, GRG, HCL, MON, RSN, USM.
Polybutylene type resins	No	ENJ, SHC.
Polyester resins, saturated:	Yes	
Polybutylene terephthalate (PBT)	No	AGI, GE, GEP, HCL, ICF, MOB, USM.
Polyethylene terephthalate (PET)	Yes	ACS, DUP, EK, EKT, FBI, GEP, GGI, GYR, HCL, ICI, MOB, USM.
All other polyester resins, saturated	Yes	COO, CPV, DUP, EKT, GLD, GRG, GYR, ICF, ICI, MNP, PPG, REL, SW.
Polyethylene and copolymers resins:		
Ethylene-acrylic acid resins (EAA)	No	DOW.
Ethylene-vinyl acetate (EVA) copolymer resins	Yes	COO, ENJ, NSC, USI.
Other ethylene copolymer resins	No	EKT, EKX, ENJ, EVL, RH, SQA.
Specific gravity 0.940 and below (conventional low density)	Yes	ACS, DOW, DUP, EKX, ELP, ENJ, SM, SOC, SQA, UCC, USI, (2)
Specific gravity 0.940 and below (linear low density) ...	Yes	ENJ, SM, USI.
Specific gravity over 0.940	Yes	ACS, AMO, CNE, DOW, DUP, ENJ, HIM, PLC, SLT, SOC, UCC, USI.
Polyphenyl aromatic ester resins	No	HPC.
Polypropylene polymer and copolymer resins	Yes	AMO, ART, CSD, EKX, ELP, ENJ, HIM, PLC, SHC, SLT, USI.
Polyterpene resins	Yes	ARZ, HPC, RCI, REL, SCN.
Rosin modifications:	Yes	
Modified rosin (unesterified)	Yes	ARZ, CJO, HPC, NCI, SYL, WVA.
Modified rosin esters	Yes	EW, FRP, GP, GRV, HCL, HPC, ICF, LII, MCC, NCI, RCI, SYL, WVA.
Rosin esters, unmodified (Ester gums)	Yes	ARZ, CPV, FJI, FRP, HPC, NCI, PRT, RCI, SYL.
Styrene type plastics materials:		
Acrylonitrile-butadiene-styrene (ABS) terpolymer resins and certain other styrene type plastics materials	Yes	DOW, GEP, GRD, MCB, MON.
Methyl methacrylate-butadiene styrene (MBS) resins and certain other styrene type plastic materials	Yes	FER, GYR, ICI, MRT, RH.
Styrene-acrylonitrile copolymer resins (SAN)	No	BFG, GE, ICI, MCB, MON.
Polystyrene:		
Expandable polystyrene beads	Yes	ATR, BAS, DPI, HMN.
Rubber modified polystyrene	Yes	API, CSD, DOW, DPI, HMN, PLR, SM.
Straight polystyrene	Yes	AEP, AMO, API, ATR, CSD, DOW, DPI, GAF, HGC, HMN, HPC, KTP, PLR, SM, SOC.
Styrene latexes:		
Styrene-butadiene latexes	Yes	DOW, GRD, GYR, PYI, UOC.
All other styrene latexes	Yes	ADC, CCS, CRS, FRS, GNT, GRD, MCC, SPO, UCC, UOC.
Other styrene copolymers:		
α -Methyl styrene polymers	No	AIP, AMO, CPV.
Styrene-allyl alcohol copolymer resins	No	CYR, HPC, MON.
Styrene-divinylbenzene copolymer resins	No	DOW, RH.
Styrene-maleic anhydride copolymer resins	No	ATR, MON.
Styrene-methyl methacrylate copolymer resins	No	ADC, DSO, GGI(E), RCD.
All other styrene copolymers	No	AIP, ARZ, CPV, DSO, DUP, EW, FLH, GEP, HPC, JSC, MON, OBC, PLC, RCD.

See footnotes at end of table.

Section 8

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Plastics and resin materials</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 26)</i>
Thermoplastic resins—Continued		
Vinyl resins:		
Polyvinyl acetate resins	Yes	AIP, CGL, DAN, DSO, FLH, FLN, GLD, GRD, JOB, JSC, MNP, MON, NSC, PRA, PYI, RCI, SCO, SQA, UCC, UOC, (2)
Polyvinyl alcohol resins	No	AIP, DUP, SAC.
Polyvinyl butyral resins	No	MON, SAC.
Polyvinyl formal resin	No	EW, GRG, MON.
Vinyl acetate-acrylate copolymers	Yes	ACO, AIP, DAN, DSO, FLH, FLN, GLD, KMP, MCC, NCJ, NTC, OBC, PRA, RH, SPC, SQA, UCC, UOC.
Polyvinyl chloride and copolymer resins:		
Polyvinyl chloride homopolymer resins	No	AIP, BFG, BPC, CNT, FOR, GGC, GYR, HKP, KYS, SHT, UCC, VST, VYN.
Vinyl chloride-acetate copolymer resins	No	KYS, MCC.
All other polyvinyl chloride copolymer resins	No	BFG, HKP, VYN.
Polyvinylidene chloride resins:		
Latex type polyvinylidene chloride resins	Yes	BFG, DOW, GRD, UOC.
Solid type polyvinylidene chloride resins	No	DOW.
All other vinyl resins	Yes	DUP, FLH, GLD, NCJ, NTC, RH, UCC, (2)
All other thermoplastic resins,	Yes	DUP, ENJ, LII, MCC, MON, UOC, WLN, (2)

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 26

Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ACO	Adco Chemical Co.	CNI	Conap, Inc.
ACR	Acme Resin Corp.	CNT	Certainfeed Corp.
ACS	Allied Corp., Allied Signal Corp. Engineered Materials Sector. High Density Polyethylene Business	COO	H. B. Fuller Co.
ACY	American Cyanamid Co.	CPV	Cook Paint & Varnish Co.
ADC	Anderson Development Co.	CRS	Colorado Resins, Inc.
AEP	A & E Plastics Corp.	CSD	Fina Oil & Chemical Co., Cosden Chemical Div.
AGI	EMS-American Grilon, Inc.	CTP	Continental Polymers, Inc.
AIP	Air Products & Chemicals, Inc.	CTR	Custom Resins Div. of Bemis Co., Inc.
AMO	Amoco Corp.	CXI	Chemical Exchange Industries, Inc.
APH	Alpha Corporation of Tennessee	CYR	CYRO Industries
API	American Polymers, Inc.	DAN	Dan River, Inc., Chemical Products Div.
ARK	Armstrong World Industries, Inc.	DCC	Dow Corning Corp.
ARO	Arco	DGO	Day-Glo Color Corp.
ART	Aristech Chemical Corp., Chemical Div.	DNS	Dennis Chemical Co.
ARZ	Arizona Chemical Co.	DOW	Dow Chemical Co.
ASH	Ashland Oil, Inc.	DPI	Dart Polymers, Inc. Sub of Dart Container Corp.
ASL	SpecialtyChem Products Corp.	DRB	The Derby Co., Inc.
ATR	Atlantic Richfield Co., Arco Chemical Co.	DRC	Dock Resins Corp.
AUS	Ausmont N.V.	DRR	Delta Resins & Refractories
AUX	Auralux Corp.	DSO	DeSoto, Inc.
BAL	Sherwin-Williams Co., Consumers Div.	DUP	E. I. duPont de Nemours & Co., Inc. AF/FP Dept. Chemicals and Pigments Dept. ED/IMG Dept. Mt. Clements Petrochemicals Dept. Polymer Products Dept.
BAS	BASF Corp.	ECC	Eastern Color & Chemical Co.
BCM	Belding Chemical Industries	EFH	E. F. Houghton & Co.
BCP	BCP, Inc.	EK	Eastman Kodak Co.:
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	EKT	Tennessee Eastman Co. Div.
BLC	Ranbar Technology, Inc. Ball Chemical Co.	EKX	Texas Eastman Co. Div.
BMC	Brin-Mont Chemicals, Inc.	ELP	Rexene Products Company
BME	Allied Bendix Corp., Friction Materials Div.	ENJ	Exxon Chemical Americas
BOR	Borden, Inc., Borden Chemical Div.	EPI	Ohio Rubber Co., Orthane Div.
BPC	Borden Plastics & Chemicals	EVL	EVAl Company of America
BPT	Permutthane Inc.	EW	Westinghouse Electric Corp., Insulating Materials Div.
BRU	M. A. Bruder & Sons, Inc.	FBI	Fibers Industries, Inc.
BSC	Cascade Resins, Inc.	FER	Ferro Corp., Keil Chemical Div.
BTL	BTL Specialty Resin Corp.	FJI	Cincinnati Varnish Co.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	FLH	H. B. Fuller Co.
CAS	CasChem, Inc.	FLN	Franklin International
CBD	Chembond Corp.	FMC	FMC Corp.
CCC	C.N.C. International Inc.	FOC	Handschy Industries, Inc., Farac Varnishes & Chemicals
CCS	Colorado Chemical Specialties, Inc.	FOR	Formosa Plastics Corp. - U.S.A.
CFX	Chemfax, Inc.	FRE	Freeman Chemical Corp.
CGL	Cargill, Inc.	FRP	FRP Co.
CGY	Ciba-Gelgy Corp.	FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.
CHC	Carpenter Chemical Co.	GAF	GAF Corp., Chemical Group
CHP	C. H. Patrick & Co., Inc.	GE	General Electric Co.:
CJO	C. J. Osborn, Div. of Suvar Corp.	GEP	Plastics Div.
CLU	CL Industries, Inc.		
CMC	Cosmic Plastics, Inc.		
CMP	Commercial Products Co., Inc.		
CNE	Cain Chemical, Inc.		

Table 26—Continued

Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
GGC	Georgia-Gulf Corp.: PVC Compound Div. Plaquemine Div.	MIL	Milliken & Co., Milliken Chemical Co.
GGI	Grow Group, Inc.	MMM	Minnesota Mining & Manufacturing Co.
GLC	General Latex & Chemical Corp.	MNP	Mcwhorther, Inc.
GLD	Glidden Co.	MOB	Mobay Chemical Corp., Pittsburgh Div.
GNT	Gencorp Polymers Products	MON	Monsanto Co.
GP	Georgia-Pacific Corp.: Resins Operations	MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div.
GRD	W. R. Grace & Co., Organic Chemicals Div., Polymers & Chemical Div.	NCI	Unlon Camp Corp., Chemical Products Div.
GRG	P. D. George Co.	NCJ	National Casein of New Jersey
GRV	Guardsman Chemicals, Inc.	NCP	Niles Chemical Paint Co.
GYR	Goodyear Tire & Rubber Co.	NEV	Neville Chemical Co.
HAN	Hanna Chemical Coatings Corp.	NSC	National Starch & Chemical Corp.
HCL	Hoechst Celanese Corp.: Engineering Plastics Div. Sou-Tex Works	NTC	National Casein Co.
HER	Heresite Protective Coatings Inc.	NTL	NL Industries, Inc.
HGC	Goodson Polymers, Inc.	OBC	O'Brien Corp.
HIL	Hilton Davis Company	OCF	Owens-Corning Fiberglas Corp.
HIM	Hlrmont U.S.A., Inc. Occidental Chemical Corp.:	OMC	Olin Corp.
HKD	Durez Div.	PAC	Pacific Anchor Chemical Corp.
HKP	PVC Div.	PAS	Pennwalt Corp.
HMN	Huntsman Chemical Corp.	PDI	Phelps Dodge Industries, Inc., Phelps Dodge Magnet Wire Co. Div.
HPC	Hercules, Inc.	PEL	Pelron Corp.
HVG	Ametek, Inc., Havg Div.	PER	Perry & Derrick Co., Inc.
HXL	Hexcel Corp., Hexcel Chemical Products Dexter Corp.:	PKL	Plaskolite, Inc.
HYA	Dexter Adhesives & Structural Materials Div.	PLC	Phillips 66 Co.
HYC	Dexter Electronic Materials Div.	PLN	Disogrin Industries Corp.
ICF	BASF Corp., Inmott Div.	PLR	Polysar, Inc.: Plastic Div.
ICI	ICI Americas, Inc. Chemicals Div. Resins Div.	PLS	Plastics Engineering Co.
INP	Synair Corp.	PMC	Plastics Manufacturing Co.
IOV	Iovite Inc.	PPG	PPG Industries, Inc.
IPC	Interplastic Corp.	PPL	Sterling Engineered Products
IRI	Stuart-Ironsides, Inc.	PRA	Para-Chem Southern
JNS	S.C. Johnson & Son, Inc.	PRC	Products Research & Chemical Corp.
JOB	Jones-Blair Co.	PRT	Pratt & Lambert, Inc., Paint Div.
JSC	Sybron Chemicals, Inc.	PSG	PMC Specialites Group
KMP	Kelly-Moore Paint Co., Inc.	PSL	Plaslok Corp.
KPT	Beazer Materials & Services, Inc.	PST	Perstorp Compounds, Inc.
KTP	Kent Polymers, Inc.	PTC	Polycast Technology Corp.
LC	Lord Corp., Chemical Products Group	PYI	Morton Thiokol, Inc. Morton Chemical Div.
LIC	Lilly Industrial Coatings, Inc.	QCP	Quaker Chemical Corp.
LII	Lawter International, Inc.	QUN	K. J. Quinn & Co., Inc.
MCA	Masonite Corp., Alpine Resin Div.	RAS	Surface Coatings, Inc.
MCB	Borg-Warner Corp., Borg Warner Chemicals	RBI	Reeves Brothers, Inc.
MCC	McCloskey Corp.: McCloskey Varnish Co. of California McCloskey Varnish Co. of Oregon	RCD	Richardson Polymer Corp.
MID	Dexter Corp., Midland Div.	RCI	Relchhold Chemicals, Inc.
		REL	Reliance Universal, Inc., Louisville Resins Operations
		REZ	Hi-Tek Polymers, Inc.
		RH	Rohm & Haas Co.
		RSN	Atochem, Inc., Polymers Div.
		RTC	Mount Vernon Mills, Inc.
		RUO	Ruco Polymer Corp.
		S	Sandoz, Inc., Colors & Chemicals Div.

Table 26—Continued

Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
SAC	Southeastern Adhesives Co.	SPO	Ameripol Synpol Co. Div. of Uniroyal Goodrich Tire Co.
SAR	Esschem Inc.	SQA	Sequa Chemicals, Inc.
SBG	Samuel Bingham Co.	SRY	Synray Corp.
SCN	Schenectady Chemicals, Inc.	SW	Sherwin-Williams Co.
SCO	Scholler, Inc.	SYL	Arizona Chemical Co.
SCP	Henkel Corp.	SYT	Synthron, Inc.
SHC	Shell Oil Co., Shell Chemical Co.	TNA	Ethyl Corp.
SHT	Shlntech, Inc.	TXS	Scott Polymers, Inc.
SHX	Shrex Chemical Co. BP Chemicals, Inc:	UCC	Union Carbide Corp.
SIC	Silmar Div.	UNO	United-Erie, Inc.
SIF	Fillon Div.	UOC	Union Oil Co. of California
SLC	Soluol Chem Co., Inc.	USI	Quantum Chemical Corp., USI Division
SLT	Soltex Polymer Corp.	USM	Emhart Corp., Bostik U.S. Div.
SM	Mobil Oil Corp.: Mobil Chemical Co.: Chemical Products Div. Petrochemicals Div. Polystyrene Business Group	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SMO	Smooth-On, Inc.	UTC	Unitex Chemical Corp.
SOC	Chevron Corp., Chevron Chemical Co.	VST	Vista Chemical Co.
SOR	MW Manufacturers, Inc., Southern Resin Div.	VSV	Valentine Sugars, Inc., Valte Div.
SPC	Insilco Corp., Sinclair Paint Co. Div.	VYN	Vygen, Inc.
SPD	General Electric Co., Silicone Products Dept.	WCA	West Coast Adhesives Co.
SPL	Spaulding Composites Co., Inc.	WLN	Wilmington Chemical Corp.
		WM	Inolex Chemical Co.
		WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
		WRD	Weyerhaeuser Co.
		WVA	Westvaco Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 9

Rubber-Processing Chemicals

Rubber-processing chemicals are organic compounds that are added to natural and synthetic rubber to give them qualities necessary for their conversion into finished rubber goods. In this report, statistics are given for cyclic and acyclic compounds by use—such as accelerators, antioxidants, and vulcanizing agents. Data on production and sales of rubber-processing chemicals in 1988 are given in table 27. Data on production of rubber-processing chemicals during 1984-88 is given in figure 10.

Production of rubber-processing chemicals as a group in 1988 amounted to 353 million pounds, or 8 percent less than the 382 million pounds produced in 1987. Sales of rubber-processing chemicals in 1988 amounted to 266 million pounds, valued at \$424 million, compared with 289 million pounds, valued at \$359 million, in 1987.

Table 28 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 29.

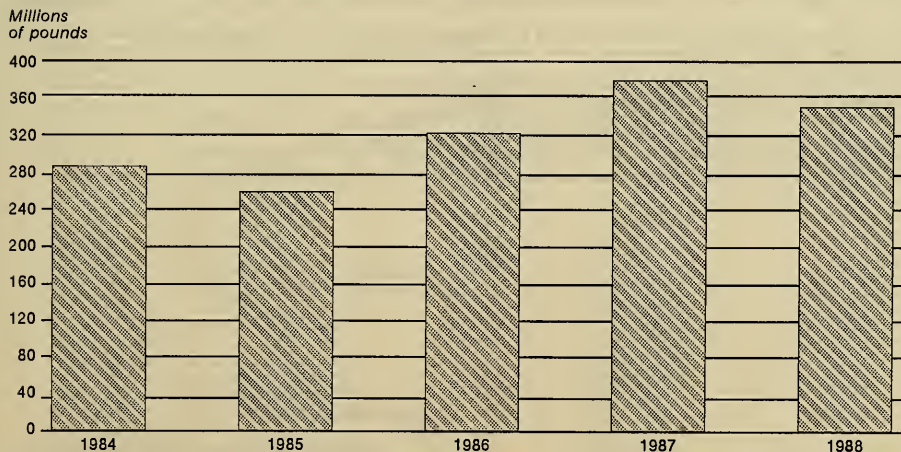
The production of cyclic rubber-processing chemicals in 1988 amounted to 318 million

pounds, or 10 percent less than the 354 million pounds produced in 1987. Sales of cyclic rubber-processing chemicals in 1988 totaled 236 million pounds, valued at \$397 million, compared with 263 million pounds, valued at \$336 million, in 1987. Of the total production of cyclic rubber-processing chemicals in 1988, antioxidants, antiozonants, and stabilizers accounted for 70 percent, and accelerators, activators, and vulcanizing agents for 26 percent. Production of antioxidants, antiozonants, and stabilizers, which amounted to 224 million pounds in 1988, included 134 million pounds of amino compounds and 90 million pounds of phenolic and phosphite compounds. Sales of amino antioxidants, antiozonants, and stabilizers in 1988 amounted to 104 million pounds, valued at \$168 million; sales of phenolic and phosphite compounds were 56 million pounds, valued at \$87 million.

Production of acyclic rubber-processing chemicals in 1988 amounted to 34 million pounds, or 24 percent more than the 28 million pounds produced in 1987. Sales in 1988 totaled 29 million pounds, valued at \$27 million, compared with 26 million pounds, valued at \$23 million, in 1987.

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Figure 10
Rubber-processing chemicals: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 9

Table 27

Rubber-processing chemicals: U.S. production and sales, 1988

Rubber-processing chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand Total	352,730	265,669	423,913	\$1.60
Cyclic				
Total	318,482	236,299	397,388	1.68
Accelerators, activators, and vulcanizing agents, total				
	83,228	64,662	107,190	1.66
Thiazole derivatives, total				
	78,507	60,733	91,743	1.51
N-tert-Butyl-2-benzothiazolesulfenamide	19,407	24,158	41,550	1.72
2,2'-Dithiobis[benzothiazole]	11,957	13,150	13,681	1.04
All other thiazole derivatives	47,143	23,425	36,512	1.56
All other accelerators, activators, and vulcanizing agents ^{2, 3}	4,721	3,929	15,447	3.93
Antioxidants, antiozonants, and stabilizers, total				
	223,662	160,343	255,580	1.59
Amino compounds, total				
	133,681	104,164	168,354	1.62
Substituted p-phenylenediamines	84,987	55,797	103,551	1.86
All other amino compounds ⁴	48,694	48,367	64,803	1.34
Phenolic and phosphite compounds, total⁵				
	89,981	56,179	87,226	1.55
Polyphenolics	7,813	6,904	24,083	3.49
Phenol, hindered	(⁶)	1,304	2,654	2.04
All other phenolic and phosphite compounds	82,168	47,971	60,489	1.18
All other cyclic rubber-processing chemicals ⁷	11,592	11,294	34,618	3.07
Acyclic				
Total	34,248	29,370	26,525	.90
Accelerators, activators, and vulcanizing agents				
	5,878	4,726	11,479	2.43
All other acyclic rubber-processing chemicals ⁸	28,370	24,644	15,046	.61

¹ Calculated from unrounded figures.² Includes aldehyde-amine reaction products, dithiocarbamates, and other accelerators, activators, and vulcanizing agents.³ Data on dithiocarbamates included in this table are for materials used chiefly in the processing of natural and synthetic rubber. Data on dithiocarbamates, which are used chiefly as fungicides, are included in the section on "Pesticides and Related Products."⁴ Includes aldehyde- and acetone-amine reaction products and other amines.⁵ Also includes other antioxidants, antiozonants, and stabilizers.⁶ Reported data were accepted in confidence and may not be published, or no data were reported.⁷ Includes blowing agents, peptizers, and other cyclic rubber-processing chemicals.⁸ Includes polymerization regulators, shortstops, and other acyclic rubber processing chemicals.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 28

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Rubber-processing chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 29)
Cyclic		
Accelerators, activators, and vulcanizing agents:	Yes	
Aldehyde-amine reaction products:		
Heptaldehyde-aniline condensate	No	USR.
Triethyltrimethylenetriamine	No	USR.
All other aldehyde-amine reaction products, cyclic	No	DUP.
Dithiocarbamic acid derivatives:		
Dibenzylthiocarbamic acid, sodium salt	No	USR.
Dibenzylthiocarbamic acid, zinc salt	No	USR.
2,4-Dinitrophenyl dimethylthiocarbamate	No	USR.
Thiazole derivatives:	Yes	
N-tert-Butyl-2-benzothiazolesulfenamide	Yes	BFG, MON, USR.
N-Cyclohexyl-2-benzothiazolesulfenamide	No	MON, USR.
2,2'-Dithiobis[benzothiazole]	Yes	BFG, MON, USR.
2-Mercaptobenzothiazole	No	MON, USR.
2-Mercaptobenzothiazole, copper salt	No	ACY.
2-Mercaptobenzothiazole, zinc salt	No	USR, VNC.
N-Morpholinyl-2-benzothiazolyl disulfide	No	GYR.
N-Oxydiethylene-2-benzothiazolesulfenamide	No	BFG, USR.
N-Oxydiethylenethiocarbonyl-N'-oxydiethylene-sulfenamide	No	BFG.
All other thiazole derivatives, cyclic	No	(?).
All other cyclic accelerators, activators, and vulcanizing agents:	Yes	
Bis(morpholinothiocarbonyl) disulfide	No	ACY.
Dibenzylamine	No	HXL.
1,3-Dihydro-4(or 5)-methyl-2H-benzimidazole-2-thione	No	VNC.
Dimethylammonium hydrogen isophthalate	No	VNC.
DI-N,N'-pentamethylenethiuram tetrasulfide	No	DUP, VNC.
4,4'-Dithiodimorpholine	No	MON.
2-Mercaptotoluimidazole, zinc salt	No	VNC.
m-Phenylenebismaleimide	No	DUP.
All other accelerators, activators, and vulcanizing agents, cyclic	No	DUP, USR.
Antioxidants, antiozonants, and stabilizers:	Yes	
Amino antioxidants, antiozonants, and stabilizers:	Yes	
Aldehyde- and acetone-amine reaction products:		
Butyraldehyde-aniline condensate	No	DUP.
Diphenylamine-acetone aldehyde	No	USR.
Diphenylamine-acetone condensate	No	BFG, USR.
All other aldehyde and acetone-amine reaction products	No	USR.
Substituted p-phenylenediamines:	Yes	
Alkylaryl-p-phenylenediamines	No	MON.
N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	No	MON, UPM.
N,N'-Bis(1-ethyl-3-methylpentyl)-p-phenylenediamine	No	UPM.
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	No	UPM.
N-Cyclohexyl-N'-phenyl-p-phenylenediamine	No	USR.
Diarylenediamines, mixed	No	GYR.
N-(1,3-Dimethylbutyl)-N'-phenyl-p-phenylenediamine	No	UPM, USR.
N,N'-DI-2-naphthyl-p-phenylenediamine	No	BFG.
N,N'-Diphenyl-p-phenylenediamine	No	BFG.
N-Isopropyl-N'-phenyl-p-phenylenediamine	No	USR.
N-(1-Methylheptyl)-N'-phenyl-p-phenylenediamine	No	UPM.
N-(1-Methylpentyl)-N'-phenyl-p-phenylenediamine	No	USR.
All other p-phenylenediamines, substituted	No	KPI, USR.

See footnotes at end of table.

Section 9

Table 28—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Rubber-processing chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 29)
Cyclic—Continued		
Antioxidants, antiozonants, and stabilizers—Continued		
Amino antioxidants, antiozonants, and stabilizers—Cont.		
Other amines:		
p-Anilinophenol	No	BFG.
1,2-Dihydro-2,2,4-trimethylquinoline	No	BFG, MON, USR.
Nonyldiphenylamine mixture (mono-, di-, and tri-)	No	USR.
Octyldiphenylamine	No	BFG, USR.
Octyldiphenylamine, alkylated	No	BFG.
p-(p-Toluenesulfonamido)diphenylamine	No	USR.
Phenolic and phosphite antioxidants and stabilizers:	Yes	
Phosphites:		
Alkylaryl phosphites mixed	No	FER, MCB.
Nonylphenyl phosphites, mixed	No	MCB, OMC, USR.
Polymeric phosphites	No	MCB.
Polyphenolic phosphites, polyalkylated	No	BFG, MCB.
Triaryl phosphites	No	MCB.
Polyphenolics (including bisphenols):	Yes	
Bisphenol, hindered	No	USR.
4,4'-Butylidenebis(6-tert-butyl-m-cresol)	No	MON.
2,5-Di-sec-butyldecylhydroquinone	No	USR.
2,5-Di-(1,1-dimethylpropyl)hydroquinone	No	MON.
2,2'-Methylenebis(6-tert-butyl-p-cresol)	No	ACY, FER.
2,2'-Methylenebis(6-tert-butyl-4-ethylphenol)	No	ACY.
1,1,3-Tri(2-methyl-4-hydroxy-5-tert-butylphenyl) butane	No	ICI.
All other phenolic antioxidants and stabilizers:		
Phenol, alkylated	No	ACY, BFG, GYR, NEV.
Phenol, hindered	Yes	FER, GYR, OMC, RCI, USR.
Phenol, styrenated, mixtures	No	NEV, USR.
N-Stearoyl-p-aminophenol	No	HXL.
All other phenolic antioxidants	No	USR.
Blowing agents:		
p,p'-Oxybis(benzenesulfonylhydrazide)	No	USR.
5-Phenyltetrazole	No	OMC.
p-Toluenesulfonylhydrazide	No	USR.
p-Toluenesulfonylsemicarbazide	No	USR.
All other blowing agents, cyclic	No	OMC.
Peptizers:		
2',2'''-Dithiobis(benzanilide)	No	ACY.
All other cyclic rubber-processing chemicals:		
p-tert-Amylphenol sulfide (Tackifier)	No	PAS.
4-Chloro-2,6-bis(2,4-dihydroxybenzyl)phenol	No	ICI.
N-(Cyclohexylthio)phthalimide	No	MON.
Diphenyl-4,4'-diphenylmethylenediacetate	No	USR.
All other rubber-processing chemicals, cyclic	No	ACY, FER.
Acyclic		
Accelerators, activators, and vulcanizing agents:		
Dithiocarbamic acid derivatives:	Yes	
Diaryldithiocarbamic acid derivative	No	VNC, VNC, (2), (2).
Dibutyldithiocarbamic acid, nickel salt	No	DUP, USR, VNC.
Dibutyldithiocarbamic acid, sodium salt	No	DUP, USR, VNC.
Dibutyldithiocarbamic acid, zinc salt	No	VNC.
Diethyldithiocarbamic acid, cadmium salt and bis (diethyldithiocarbamoyl) disulfide, mixture	No	VNC.
Diethyldithiocarbamic acid, selenium salt	No	VNC.
Diethyldithiocarbamic acid, sodium salt	No	EK, VNC.

See footnotes at end of table.

Table 28—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Rubber-processing chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 29)
Acyclic—Continued		
Accelerators, activators, and vulcanizing agents—Cont.		
Dithiocarbamic acid derivatives—Continued		
Diethyldithiocarbamic acid, tellurium salt	No	VNC.
Diethyldithiocarbamic acid, zinc salt	No	VNC.
Dimethyldithiocarbamic acid, bismuth salt	No	VNC.
Dimethyldithiocarbamic acid, copper salt	No	VNC.
Dimethyldithiocarbamic acid, lead salt	No	VNC.
Dimethyldithiocarbamic acid, selenium salt	No	VNC.
Dimethyldithiocarbamic acid, sodium salt		
and sodium polysulfide	No	BFG.
Dimethyldithiocarbamic acid, zinc salt	No	VNC.
All other dithiocarbamic acid derivatives, acyclic	No	DUP, (2).
Thiurams:		
Bis (dibutylthiocarbamoyl) disulfide	No	VNC.
N,N'-Dioctadecyl-N,N'-diallylthiuram disulfide	No	USR.
Xanthates and sulfides:		
Di-n-butylxantho disulfide	No	USR.
Zinc isopropyl xanthate	No	VNC.
All other accelerators, activators, and vulcanizing agents, acyclic	No	DUP.
Polymerization regulators:		
n-Decyl mercaptan	No	PLC.
n-Dodecyl mercaptans	No	PAS, PLC.
tert-Nonyl mercaptan	No	PAS, PLC.
n-Octyl mercaptan	No	PLC.
All other polymerization regulators, acyclic	No	PLC, USR.
Shortstops:		
Dimethyldithiocarbamic acid, potassium salt	No	USR.
Dimethyldithiocarbamic acid, sodium salt	No	ALC, USR, VCC.
All other acyclic rubber-processing chemicals:		
Waxes and paraffinic products	No	DUP.
Zinc laurate (Activator, physical property improver, and processing auxiliary)	No	USR.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 29

Rubber-processing chemicals: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACY	American Cyanamid Co.	KPI	Kenrich Petrochemicals, Inc.
ALC	Alco Chemical Corp.	MCB	Borg-Warner Corp., Borg Warner Chemicals
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group	MON	Monsanto Co.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept. Polymer Products Dept.	NEV	Neville Chemical Co.
EK	Eastman Kodak Co.	OMC	Olin Corp.
FER	Ferro Corp., Ferro Chemical Div.	PAS	Pennwalt Corp.
GYR	Goodyear Tire & Rubber Co.	PLC	Phillips 66 Co.
HXL	Hexcel Corp., Hexcel Chemical Products	RCI	Relchhold Chemicals, Inc.
ICI	ICI Americas, Inc., Chemicals Div.	UPM	UOP, Inc.
		USR	Uniroyal, Inc., Unroyal Chemical Div.
		VCC	Vinings Chemical Co.
		VNC	Vanderbilt Chemical Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 10

Elastomers

Elastomers (synthetic rubber) are high polymeric materials with properties similar to those of natural rubber. The term "elastomers" as used in this report means substances, whether in bale, crumb, powder, latex, or other crude form, which can be vulcanized or similarly processed into a material that can be stretched to at least twice their original length; and, after having been so stretched and the stress removed, will return with force to approximately their original length. U.S. production and sales of elastomers in 1988 are shown in table 30.

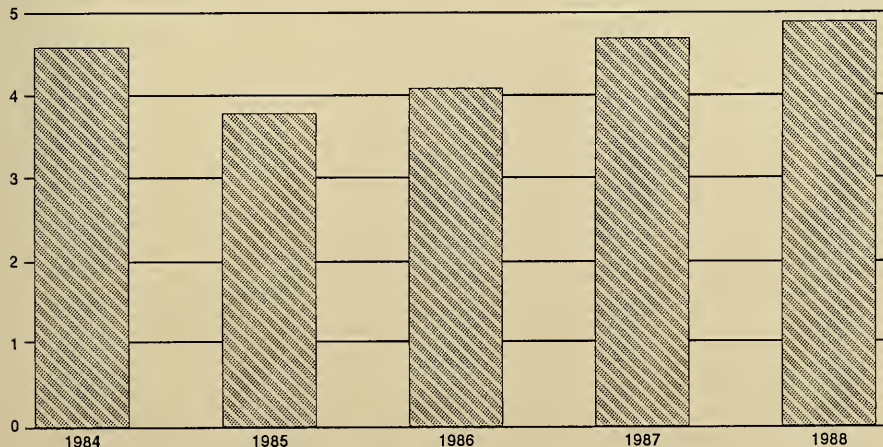
Table 31 lists the products reported in this section and indicates the manufacture(s) of each by code. These codes are identified by company names in table 32.

Total U.S. production¹ of synthetic rubber in 1988 amounted to 4,907 million pounds, an increase of 4.6 percent from that produced in 1987. The production of synthetic rubber increased irregularly from 4,609 million pounds in 1984 to 4,907 million pounds in 1988, or by 6.4 percent. (see figure 11). Total sales of

¹ Until now urethane type elastomers have been included in the section VIII "Plastics and Resin Materials." The commission has now begun reporting statistics for urethane elastomers in two sections, section VIII, plastics and resin materials, and section X, elastomers (synthetic rubber). Henceforth those polyurethane products classified as "thermoplastic" urethane elastomers will be reported in SOC section X; all other urethane elastomers will remain in SOC section VIII.

Figure 11
Elastomers: U.S. production, 1984-88

Billions
of pounds



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

elastomers in 1988 amounted 3,234 million pounds, an increase of 4 percent from that sold in 1987.

Styrene-butadiene rubber (SBR-type rubber) in 1988 continued to be the elastomer produced in the greatest quantity as it has been for more than 35 years. U.S. production of SBR-type rubber, including 20 million pounds of its vinylpyridine sub-type, amounted to 1,919 million pounds in 1988. Polybutadiene rubber, mainly solution-polymerized type, was produced domestically in 1988 in the next largest amount—765 million pounds. Other principal types of synthetic elastomers for which U.S. production data are reported separately are ethylene-propylene rubber, production of which was 512 million pounds in 1988; butadiene-acrylonitrile (nitrile or NBR-type) rubber, production of which was 178 million pounds; and thermoplastic elastomers (a family of products), production of which was 421 million pounds in 1988.

Sales of SBR-type rubber, including 12 million pounds of its vinylpyridine sub-type, by U.S. producers in 1988 amounted to 1,025 million pounds. Sales of polybutadiene rubber amounted to 385 million pounds, and those of ethylene-propylene rubber to 454 million pounds. Sales of nitrile rubber amounted to 136 million pounds, silicone type elastomer sales amounted to 146 million pounds, and sales of thermoplastic elastomers amounted to 358 million pounds in 1988.

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Table 30

Elastomers (synthetic rubber):¹ U.S. production and sales, 1988

Elastomers	Production ²	Sales		Average Unit value ³
		Quantity ²	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	4,906,572	3,234,468	2,982,130	\$0.92
Butadiene-acrylonitrile type (nitrile) (NBR-type)	177,812	135,952	129,062	.95
Ethylene-propylene type (EP-type)	512,374	453,824	366,934	.81
Polybutadiene type (BR-type)	765,494	385,039	189,784	.49
Silicone (Q) type elastomers	(⁴)	146,078	503,864	3.45
Styrene-butadiene type (SBR-type) ⁵	1,899,094	1,012,834	537,240	.53
Styrene-butadiene-vinylpyridine type	20,397	11,852	13,227	1.12
Thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, thermoplastic poly-urethane elastomers, and co-polyesters)	420,989	357,604	419,807	1.17
All other elastomers ⁶	1,110,412	731,285	822,212	1.12

¹ The term "elastomers" is defined as substances in bale, crumb, powder, latex, and other crude forms which can be vulcanized or similarly processed into materials that can be stretched at 68° F. to at least twice their original length and, after having been stretched and the stress removed, will return with force to approximately their original length.

² Includes oil content of oil-extended elastomers.

³ Calculated from unrounded figures.

⁴ Reported data are accepted in confidence and may not be published, or no data reported.

⁵ More than four-fifth of SBR elastomer production is the dry type of product.

⁶ Includes butyl, chlorinated natural rubber, chlorinated polyethylene, epichlorohydrin, fluoroelastomers, polyacrylic ester type, polychloroprene (neoprene) type, polyisoprenes (including cyclorubber), polysulfide, silicone type (production only), and miscellaneous elastomers.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 31

Elastomers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Elastomers	Separate statistics ¹	Manufacturers' identification codes (according to list in table 32)
Cyclic		
Cyclized polyisoprene (Cyclorubber)	No	WAY.
Epichlorohydrin elastomers (CO, ECO) type	No	BFG.
Styrene-butadiene (S or SBR) type:	Yes	
Styrene-butadiene, dry type	No	CPY, FRS, GRD, GYR, SPO.
Styrene-butadiene, latex type	No	BAS, BFG, GYR, MMM, RCI.
Styrene-butadiene-vinylpyridine	Yes	BFG, FRS, GNT, GYR.
All other styrene-butadiene type elastomers	No	ASY, LC.
Thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, thermoplastic polyurethanes elastomers, and co-polyester)	Yes	BFG, DOW, EEP, ENJ, FRS, GEP, MON, SHC.
All other cyclic elastomers	No	TNA.
Acyclic		
Butadiene-acrylonitrile (nitrile) (NBR) type	Yes	BFG, CPY, GYR, MMM, RCI, USR.
Butyl(isobutylene-isoprene) type	No	ENJ.
Chlorinated rubber, natural and synthetic	No	DOW, HPC.
Chlorosulfonated polyethylene (CSM) type	No	DUP.
Ethylene-propylene (EP) type	Yes	CPY, DUP, ENJ, USR
Fluorelastomers (CFM, FKM, FFKM) type	No	DUP, MMM.
Polyacrylate ester type:		
Polyacrylic (ACM) type elastomers	No	ACY, BFG.
Polyalkylene oxide	No	PRC.
Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)		
(PBAN)	No	ASY.
Polybutadiene (BR) type	Yes	ASY, FRS, GYR, PLC, RCI, SPO.
Polychloroprene (Neoprene) (CR) type	No	DKA, DUP, LC.
Polyisoprene (IR) type	No	GYR.
Polysulfide (T) type elastomers	No	MRT.
Silicone (Q) type elastomers	Yes	DCC, DUP, SPD, SWS.
All other acyclic elastomers	No	MRT.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 32

Elastomers (synthetic rubber): Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACY	American Cyanamid Co.	GYR	Goodyear Tire & Rubber Co.
ASY	American Synthetic Rubber Corp.	HPC	Hercules, Inc.
BAS	BASF Corp.	LC	Lord Corp., Chemical Products Group
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	MMM	Minnesota Mining and Manufacturing Co.
CPY	Copolymer Rubber & Chemical Corp.	MON	Monsanto Co.
DCC	Dow Corning Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div
DKA	Mobay Synthetics Corp.	PLC	Phillips 66 Co.
DOW	Dow Chemical Co.	PRC	Products Research & Chemical Corp.
DUP	E. I. duPont de Nemours & Co., Inc.; Polymer Products Dept.	RCI	Relchold Chemicals, Inc.
EEP	Fluorocarbon Company	SHC	Shell Oil Co., Shell Chemical Co.
ENJ	Exxon Chemical Americas;	SPD	General Electric Co., Silicone Products Dept.
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.	SPO	Ameripol Co., Div. of Uniroyal Goodrich Tire Co.
GEP	General Electric Co., Plastics Div.	SWS	Wacker Silicones
GNT	Gencorp Polymers Products	TNA	Ethyl Corp
GRD	W. R. Grace & Co., Polymers & Chemical Div.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
		WAY	Olin Hunt Speciality Products, Inc.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 11

Plasticizers

Plasticizers are organic chemicals that are added to synthetic plastics and resin materials to (1) improve workability during fabrication, (2) extend or modify the natural properties of these materials, or (3) develop new improved properties not present in the original material. Table 33 presents statistics on U.S. production and sales of plasticizers in as great a detail as is possible without revealing the operations of individual producers. U.S. production of plasticizers totaled 2,300 million pounds in 1988, an increase of 15.1 percent from the 1,998 million pounds reported for 1987. The trend of production of these products is shown in the graph in figure 12. Sales of plasticizers totaled 1,874 million pounds, valued at \$1,001 million, in 1988, compared with 1,876 million pounds, valued at \$896 million, in 1987.

Production of cyclic plasticizers in 1988, which consisted chiefly of the esters of phthalic anhydride, phosphoric acid, and trimellitic acid,

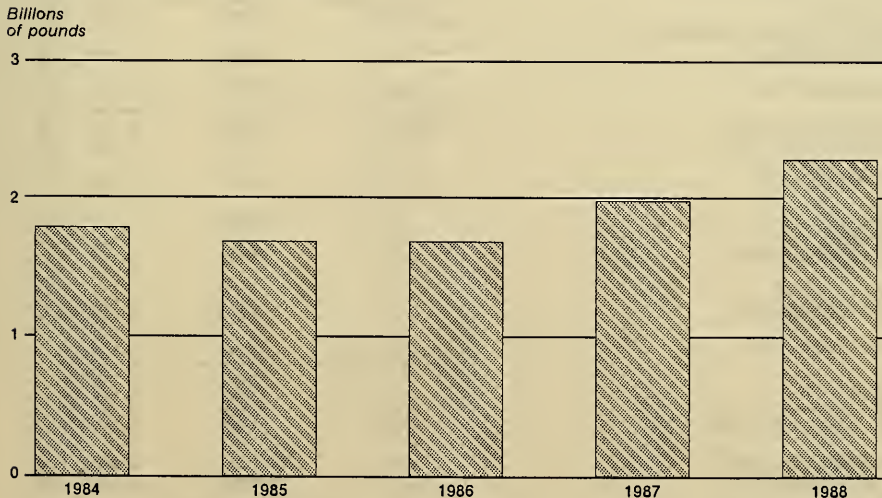
amounted to 1,775 million pounds, an increase of 22.0 percent from the 1,455 million pounds reported for 1987. Sales of cyclic plasticizers in 1988 totaled 1,440 million pounds, valued at \$700 million, compared with 1,452 million pounds, valued at \$628 million, in 1987. The most important cyclic plasticizers were the dioctyl phthalates, with production of 344 million pounds, in 1988.

Production of acyclic plasticizers in 1988 totaled 526 million pounds, decrease of 3.2 percent from the 543 million pounds reported for 1987. Sales of acyclic plasticizers totaled 434 million pounds, valued at \$301 million, in 1988, compared with 424 million pounds, valued at \$268 million, in 1987. Adipic acid esters were the most important acyclic plasticizers in 1988 with production of 153 million pounds.

Table 34 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 35.

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Figure 12
Plasticizers: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 11

Table 33
Plasticizers: U.S. production and sales, 1988

Plasticizers	Production ¹	Sales		Average Unit value ²
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	2,300,416	1,873,590	1,001,303	\$0.53
Benzenoid ³	1,996,422	1,598,590	820,105	.51
Nonbenzenoid	303,994	275,000	181,198	.66
Cyclic				
Total	1,774,602	1,439,828	700,084	.49
Phthalic anhydride esters, total	1,623,214	1,307,189	590,139	.45
Dibutyl phthalates (including diisobutyl phthalates)	25,460	22,731	11,188	.49
Diethyl phthalates (including diisoethyl phthalates)	26,162	17,054	29,150	1.71
Diisodecyl phthalate ⁴	176,953	169,597	69,685	.41
Diisononyl phthalate	221,347	200,939	80,806	.40
Dioctyl phthalates ⁴	344,268	352,889	141,635	.40
DI-tridecyl phthalate	27,202	24,755	14,203	.57
All other phthalic anhydride esters	801,822	519,224	243,472	.47
Trimellitic acid esters	54,875	60,673	44,937	.74
All other cyclic plasticizers ⁵	96,513	71,966	65,008	.90
Acyclic				
Total	525,814	433,762	301,219	.69
Adipic acid esters, total	152,605	98,069	70,455	.72
DI(2-ethylhexyl) adipate	50,042	52,432	29,294	.56
Diisodecyl adipate	2,084	3,430	1,376	.40
Ditridecyl adipate	6,267	6,236	5,870	.94
All other adipic acid esters	94,212	35,971	33,915	.94
Complex linear polyesters and polymeric plasticizers, total	88,216	67,658	55,710	.79
Adipic acid type	54,452	53,298	42,045	.82
All other complex linear polyester & polymeric plasticizers	33,764	14,360	13,665	.95
Epoxidized esters, total	134,910	130,251	68,821	.53
Epoxidized soya oil esters	114,832	113,153	55,713	.49
All other epoxidized esters	20,078	17,098	13,108	.76
Oleic acid esters, total	11,898	11,857	7,680	.65
Butyl oleate	1,610	1,508	1,040	.69
Decyl oleate	375	287	527	1.83
All other oleic acid esters	9,913	10,062	6,113	.61
2-Ethylhexyl palmitate	(⁶)	2,136	1,847	.86
DI(2-ethylhexyl) sebacate	3,201	2,982	4,388	1.47
Stearic acid esters, total	12,967	12,738	9,308	.73
n-Butyl stearate	6,427	6,807	3,955	.58
Isobutyl stearate	2,902	2,654	1,462	.55
All other stearic acid esters	3,638	3,277	3,891	1.19
Sucrose acetate Isobutyrate	3,708	3,346	4,849	1.45
All other acyclic plasticizers ⁷	118,309	104,725	78,161	.75

See footnotes at end of table.

Footnotes for table 33—Continued

¹ Includes data for compounds used principally (but not exclusively) as primary plasticizers. Does not include clearly defined extenders or secondary plasticizers.

² Calculated from unrounded figures.

³ Includes benzenoid products as defined in part 1, schedule 4, of the Tariff Schedules of the United States Annotated.

⁴ The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resin Materials), 1987*, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.

⁵ Includes data for cresyl diphenyl phosphate, dibutyl phenyl phosphate, diphenyl octyl phosphate, tricresyl phosphate, triphenyl phosphate, and other cyclic phosphoric acid esters, glycol dibenzoates, toluenesulfonamides, tetrahydrofurfuryl oleate, and other cyclic plasticizers.

⁶ Reported data were accepted in confidence and may not be published, or no data were reported.

⁷ Includes data for azelaic acid esters, citric and acetylcitric acid esters, myristic acid esters, pelargonic acid esters, ricinoleic and acetylricinoleic acid esters, glyceryl and glycol esters, and other acyclic plasticizers.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 34

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Plasticizers	Separate statistics ¹	Manufacturers' identification codes (according to list in table 35)
Cyclic	Yes	
N-n-butyl benzenesulfonamide	No	TNA, UTC.
Diethylene glycol dibenzoate	No	KLM, VEL.
Dipropenediol dibenzoate (Dipropylene glycol dibenzoate)	No	KLM, VEL.
N-Ethyl-p-toluenesulfonamide	No	NES, UTC.
Glyceryl tribenzoate	No	VEL.
Phosphoric acid esters:		
Isodecyl diphenyl phosphate	No	MON.
Tricresyl phosphate	No	FMC.
Triphenyl phosphate	No	FMC, MON.
All other phosphoric acid esters	No	FMC, MON, SM.
Phthalic anhydride esters:	Yes	
Bis(2-ethylhexyl)terephthalate	No	EKT.
Butyl benzyl phthalate	No	MON.
Butyl 2-ethylhexyl phthalate	No	BAS.
Butyl octyl phthalates	No	ART.
Cyclohexyl isooctyl phthalate	No	UTC.
Di(2-butoxyethyl) phthalate	No	HAL.
Dibutyl phthalate (including diisobutyl phthalate)	Yes	ART, BAS, EKT, HCC, MRF, NOD, UTC, WTH.
Dicyclohexyl phthalate	No	UTC. (²).
Diethylene glycol phthalate	No	CMB.
Diethyl phthalate (Diethyl isophthalate)	Yes	EKT, MON, MRF, (²).
DI-(n-heptyl-n-nonyl) phthalate	No	BAS, SC.
DI-(n-heptyl-n-nonyl) undecyl phthalate	No	BAS, ENJ, SC.
Diisodecyl phthalate	Yes	ART, BAS, ENJ, HCC, MON, NOD, TEK.
Diisohexyl phthalate	No	ENJ.
Dilisononyl phthalate	Yes	ART, BAS, ENJ, TEK.
Dimethyl isophthalate	No	UTC. (²).
Dimethyl phthalate	No	EKT, MRF, UTC, WTC.
Dinonyl phthalate	No	ENJ, SC.
DI-tridecyl phthalate	Yes	ART, ENJ, HCC, NOD, SM, TEK.
Diundecyl phthalate	No	ART, SC.
2-Ethylhexyl cyclohexyl phthalate	No	HCC.
Hexyl n-decyl phthalate	No	VST.
n-Octyl n-decyl phthalate	No	ART, VST.
Phthalic acid, diallyl ester	No	TNA.
Dioctyl phthalates:	Yes	
Di(2-ethylhexyl) isophthalate	No	MRF.
Di(2-ethylhexyl) phthalate	No	ART, BAS, EKT, ENJ, HCC, TEK.
Diiso-octyl phthalate	No	ENJ, HAL, HCC, NOD, TEK.
DI-n-octyl phthalate	No	EK.
All other dioctyl phthalates	Yes	BAS, HCC, WTH.
Glycol phthalate esters:		
Butyl phthalyl butyl glycolate	No	(²)
All other phthalic anhydride esters	No	BAS, MON, NOD, SC, TEK, WTC.
Polyethylene glycol dibenzoate	No	VEL.
Tetrahydrofurfuryl oleate	No	WTC.
Toluenesulfonamide o-, p-mixtures	No	UTC.
Trimellitic acid esters:	Yes	
Tri(2-ethylhexyl) trimellitate	No	BAS, ENJ, HCC, TEK.
Tri-n-hexyltrimellitate	No	(²)
Trilsodecyl trimellitate	No	ENJ, HCC, WM.
Trilisononyl trimellitate	No	ART, TEK.
Trilsocetyl trimellitate	No	ENJ, HAL, NOD, TEK.
Trimethyl trimellitate	No	FER, (²).
Tri-n-octyl n-decyl trimellitate	No	HAL.
Triocetyl trimellitate	No	ART, EKT.
All other trimellitic acid esters	No	ART, HAL, TEK, (²), (²).
All other cyclic plasticizers	Yes	BOE, NEV, NOD, UTC.

See footnotes at end of table.

Table 34—Continued

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Plasticizers	Separate statistics ¹	Manufacturers' identification codes (according to list in table 35)
Acyclic	Yes	
Adipic acid esters:	Yes	
Butylene glycol adipate	No	HAL.
DI(2-(2-butoxyethoxy)ethyl) adipate	No	HAL, MON.
Dibutoxyethyl adipate	No	EKT, HAL.
DI(2-ethylhexyl) adipate	Yes	ART, BAS, EKT, ENJ, HAL, HCC, MON, MRF, NOD, TEK, WTH.
Di-n-hexyl adipate	No	EKT, MON.
DIsobutyl adipate	No	HAL, HCC, MRF, WTC.
DIsodecyl adipate	Yes	HAL, HCC, MRF, NOD, TEK.
DIsononyl adipate	No	ART, ENJ, TEK.
DIsooctyl adipate	No	HCC.
DIsopropyl adipate	No	VND, WTH.
Dimethyl adipate	No	MRF, (?).
DI-n-octyl adipate	No	WM, WTH.
Ditridecyl adipate	Yes	EMR, HCC, NOD, SM, WM.
Ethylene glycol adipate	No	HAL.
Neopentyl glycol adipate	No	HAL.
n-Octyl n-decyl adipate	No	ART, HCC.
All other adipic acid esters	Yes	HAL, HCC, MON, PCI, WTC.
Azelalic acid esters:		
Bis(hydroxypropyl) azelate	No	EMR.
DI(2-ethylhexyl) azelate	No	EMR, HAL, TEK.
All other azelalic acid esters	No	WTC.
Citric and acetylcitric acid esters:		
Tributyl acetylcitrate	No	UTC.
Tributyl citrate	No	(?)
Triethyl acetylcitrate	No	(?)
Triethyl citrate	No	(?)
All other citric and acetylcitric acid esters	No	CCL, (?).
Complex linear polyesters and polymeric plasticizers:	Yes	
Adipic acid type complex linear polyesters and polymeric plasticizers	Yes	EMR, HAL, MRF, TEK, WTC, WTH.
All other complex linear polyesters and polymeric plasticizers	Yes	ARZ, EKX, EMR, SBC, SM, TEK, VND, WTC.
Epoxidized esters:	Yes	
Epoxidized linseed oils	No	UCC, WTC, VIK.
Epoxidized pentaerythritol tetraphthalate	No	UCC.
Epoxidized soya oils	Yes	FER, FMC, TEK, UCC, WTC, VIK.
2-Ethylhexyl epoxytallates	No	UCC.
Octyl epoxystearates	No	WTC.
All other epoxidized esters	Yes	REZ, UCC, VIK.
Glyceryl tripropionate	No	EKT.
Glutaric acid esters:		
Neopentyl glycol glutarate	No	HAL.
All other glutaric acid esters	No	HAL.
Lauric acid esters:		
All other lauric acid esters	No	HAL.
Myristic acid esters:		
Isopropyl myristate	No	WM, WTH.
Myristyl ethoxy myristate	No	SCP.
All other myristic acid esters	No	CAS, WTH.
Octandic acid esters:		
All other octanoic acid esters	No	HAL.
Oleic acid esters:	Yes	
Butyl oleate	Yes	CHL, EMR, HAL, WTC, WTH.
Decyl oleate	Yes	SBC, SCP, VND.
2-Ethylhexyl oleate	No	HAL.
Glyceryl trioleate (Triolein)	No	EMR, WTC.
Isobutyl oleate	No	SBC.

See footnotes at end of table.

Table 34—Continued

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Plasticizers	Separate statistics ¹	Manufacturers' identification codes (according to list in table 35)
Acyclic—Continued		
Oleic acid esters—Continued		
Isocetyl oleate	No	HAL.
Methyl oleate	No	EMR, WTC.
Neopentyl glycol dioleate	No	HCC.
Oleyl oleate	No	SBC.
Propyl oleates:		
n-Propyl oleate	No	EMR.
Trimethylolpropane trioleate	No	HCC.
All other oleic acid esters	No	HAL.
Palmitic acid esters:		
n-Butyl palmitate	No	EKT.
2-Ethylhexyl palmitate	Yes	VND, WM, WTH.
Isobutyl palmitate	No	WTH.
Isopropyl palmitate	No	CAS, WM, WTH.
All other palmitic acid esters	No	SBC.
Pelargonic acid esters:		
Glycol pelargonate	No	EMR.
Isodecyl pelargonate	No	EMR.
All other pelargonic acid esters	No	CAS, SBC, WM.
Phosphoric acid esters:		
Tri(2-butoxyethyl) phosphate	No	FMC, MON.
Triethyl phosphate	No	EKT.
Ricinic and acetylricinic acid esters:		
n-Butyl acetylricinoleate	No	CAS.
Butyl ricinoleate	No	CAS.
Glyceryl monoricinoleate	No	CAS.
Glyceryl tri(acetylricinoleate)	No	CAS.
Methyl ricinoleate	No	CAS.
All other ricinic and acetylricinic acid ester	No	CAS.
Sebacic acid esters:		
Dibutoxyethyl sebacate	No	HAL.
Dibutyl sebacate	No	HAL, HCC, WM, (2).
Di(2-ethylhexyl) sebacate	Yes	HAL, HCC, TEK, WM, (2).
Dilsopropyl sebacate	No	SBC, (2).
Dimethyl sebacate	No	EMR, UTC, (2), (2).
Propylene glycol sebacate	No	HAL.
Stearic acid esters:		
n-Butyl stearate	Yes	CHL, EMR, SCP, WM, WTC, WTH.
2-Ethylhexyl stearate	No	HCL, TCH, WM.
Glyceryl triacetyl stearate	No	CAS.
Hexadecyl stearate	No	HCL.
Isobutyl stearate	Yes	EMR, SCP, WM, WTC, WTH.
Isodecyl stearate	No	WM.
Myristyl stearate	No	VND.
2-Octyldecyl-12-stearoyl stearate	No	VND.
Tridecyl stearate	No	HCC, WM.
All other stearic acid esters	Yes	SBC, SCP, VND, WM, WTC.
Sucrose acetate isobutyrate	Yes	EKT, HAL, UCC.
Triethylene glycol di(caprylate-caprate)	No	HAL, WM.
Triethylene glycol di(2-ethylbutyrate)	No	HAL.
Triethylene glycol di(2-ethylhexanoate)	No	EKT, EKX, HAL.
All other acyclic plasticizers	Yes	ARZ, HCC, HPC, WM.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 35

Plasticizers: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ART	Arlstech Chemical Corp., Chemical Div.	FMC	FMC Corp.
ARZ	Arizona Chemical Co.	HAL	C. P. Hall Co.
BAS	BASF Corp.	HCC	Hatco Chemical Corp.
BOE	Boehme Filatex, Inc.	HCL	Hoechst Celanese Corp., Sou-Tex Works
CAS	CasChem, Inc.	HPC	Hercules, Inc.
CCL	Catawba-Charlab, Inc.	KLM	Kalama Chemical, Inc.
CHL	Chemol Co.	MON	Monsanto Co.
CMB	Cambridge Industries Co.	MRF	Morflex Chemical Co., Inc.
EK	Eastman Kodak Co.:	NES	Ruetgers-Nease Chemical Co.
EKT	Tennessee Eastman Co. Div.	NEV	Neville Chemical Co.
EKX	Texas Eastman Co. Div.	NOD	Huls America, Inc.
EMR	Quantum Chemical Corporation Corporation Emery Division	PCI	Piedmont Chemical Industries
ENJ	Exxon Chemical Americas	WM	Inolex Chemical Co.
FER	Ferro Corp.:	WTC	Witco Chemical Corp.
	Ferro Chemical Div.	WTH	Union Camp Corp.
	Grant Chemical Div.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 12

Surface-Active Agents

The surface-active agents included in this report are organic chemicals that reduce the surface tension of water or other solvents and are used chiefly as detergents, dispersing agents, emulsifiers, foaming agents, or wetting agents in either aqueous or nonaqueous systems. Waxes and products used chiefly as plasticizers are excluded. Surface-active agents are produced from natural fats and oils, from silvichemicals such as lignin, rosin, and tall oil, and from chemical intermediates derived from coal tar and petroleum. A major part of the output of the bulk chemicals shown in this report is consumed in the form of packaged soaps and detergents for household and industrial use. The remainder is used in the processing of textiles and leather, in ore flotation and oil-drilling operations, and in the manufacture of agricultural sprays, cosmetics, elastomers, foods, lubricants, paint, pharmaceuticals, and many other products.

The statistics for production and sales of surface-active agents (table 36) are grouped by ionic class and by chemical class and subclass. All quantities are reported in terms of 100-percent organic surface-active ingredients and thus exclude all inorganic salts, water, and other diluents. Sales statistics reflect sales of bulk surface-active agents only; sales of formulated products are excluded. Data for "all other" in each of the categories, which was published in previous editions, can be derived by subtracting from the totals of each category the sum of the enumerated items within that category. Data for the production of surface-active agents during 1984-88 are shown in figure 13.

Total U.S. production of surface-active agents in 1988 amounted to 7,316 million pounds, or 17 percent more than the 6,269 million pounds reported for 1987. Sales of bulk surface-active

agents in 1988 amounted to 4,261 million pounds, valued at \$2,303 million, compared with sales in 1987 of 3,923 million pounds, valued at \$1,713 million. In terms of quantity, sales in 1988 were 9 percent more than in 1987.

Production of anionic surface-active agents in 1988 amounted to 4,560 million pounds, or 62 percent of the total surfactant output reported for 1988. Sales of anionics in 1988 amounted to 2,075 million pounds, valued at \$631 million.

Production of cationic surface-active agents in 1988 amounted to 703 million pounds, 7 percent more than the 655 million pounds reported in 1987. Production of nonionic surface-active agents amounted to 2,012 million pounds in 1988, 5 percent more than the 1,909 million pounds reported in 1987. Sales of cationic surface-active agents in 1987 decreased by 2 percent in terms of quantity, and by 7 percent in terms of value when compared with sales as reported in 1987. Sales of nonionics in 1988 increased by 3 percent in terms of quantity, and by 57 percent in terms of value when compared with sales as reported in 1987.

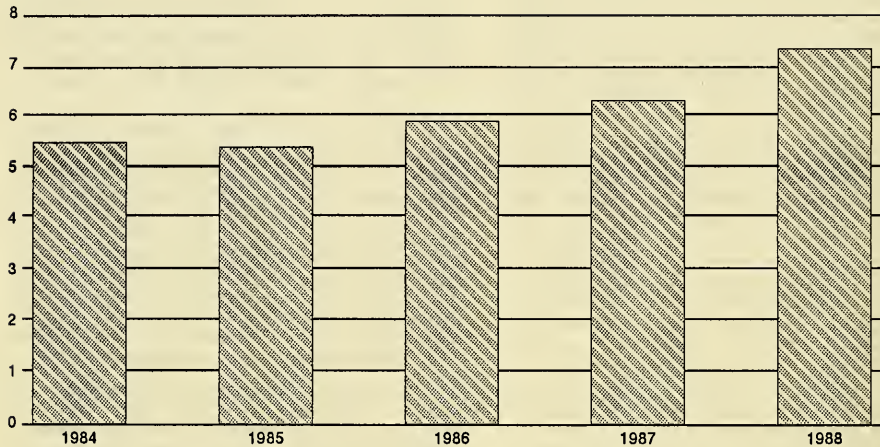
The difference between production and sales reflects inventory changes and captive consumption of surface-active agents by synthetic rubber producers, and by manufacturers of cosmetics, packaged detergents, bar soaps, and other formulated consumer products. In some instances the difference may also reflect quantities of surface-active agents used as chemical intermediates, e.g., nonionic alcohol and alkylphenol ethoxylates, which may be converted to anionic surface-active agents by phosphorylation or sulfation.

Table 37 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 38.

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202-252-1349

Figure 13
Surface-active agents: U.S. production, 1984-88

*Millions
of pounds*



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 36

Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	7,316,076	4,261,221	2,303,251	\$0.54
Benzenoid ⁴	1,622,076	911,753	513,475	.56
Nonbenzenoid	5,694,000	3,349,468	1,789,776	.53
Amphoteric				
Total	41,120	38,734	38,493	.99
(Carboxymethyl) [3-(coconut oil amido)propyl] dimethylammonium hydroxide, inner salt	7,305	7,249	8,932	1.23
N-Dodecyl-3-iminodipropionic acid, disodium salt	171	171	259	1.51
(Mixed alkyl) sulfobetaine	563	480	386	.80
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	183	183	244	1.33
All other amphoteric surface active agents	32,898	30,651	28,672	.94
Anionic				
Total	4,559,548	2,074,638	631,257	.30
Carboxylic acids (and salts thereof), total	1,269,290	250,230	100,080	.40
Amine salts of fatty, rosin, and tall oil acids, total	3,613	2,304	2,314	1.00
Stearic acid, triethanolamine salt	372	76	93	1.24
All other amine salts of fatty, rosin, and tall oil acids	3,241	2,228	2,221	1.00
Coconut oil acids, potassium salt	(⁵)	1,157	3,652	3.16
Coconut oil acids, sodium salt	186,778	6,727	2,520	.37
Oleic acid, sodium salt	264	(⁵)	(⁵)	(⁵)
Rosin acids, potassium salt	92,559	91,882	23,175	.25
Stearic acid, potassium salt	142	68	351	5.18
Tall oil acids, potassium salt	11,110	4,040	2,174	.54
Tallow acids, sodium salt	404,348	38,612	9,939	.26
All other carboxylic acids (and salts thereof)	570,476	105,440	55,955	.53
Phosphoric and polyphosphoric acid esters (and salts thereof), total	63,086	46,360	46,120	.99
Alcohols and phenols, alkoxyated and phosphated, total	45,669	35,378	32,785	.93
Decyl alcohol, ethoxyated and phosphated	1,132	1,018	912	.90
Dinonylphenol, ethoxyated and phosphated	1,114	1,105	1,171	1.06
Mixed linear alcohols, ethoxyated and phosphated	7,681	7,460	7,044	.94
Nonylphenol, ethoxyated and phosphated	7,160	6,365	6,052	.95
Octylphenol, ethoxyated and phosphated	(⁵)	1,514	1,677	1.11
Phenol, ethoxyated and phosphated	1,738	1,747	1,213	.69
Tridecyl alcohol, ethoxyated and phosphated	5,726	(⁵)	(⁵)	(⁵)
All other alcohols and phenols, alkoxyated and phosphated	21,118	16,169	14,716	.91
Decyl and octyl phosphate	1,741	1,672	1,632	.98
2-Ethylhexyl phosphate	795	627	614	.98
Mixed alkyl phosphate	3,635	2,460	3,007	1.22
All other phosphoric and polyphosphoric acid esters (and salts thereof)	11,246	6,223	8,082	1.30
Sulfonic acids (and salts thereof), total	2,285,658	1,506,957	338,861	.22
Alkylbenzenesulfonates, total	819,090	211,375	121,501	.57
Dodecylbenzenesulfonic acid	360,916	113,950	55,742	.49
Dodecylbenzenesulfonic acid, calcium salt	5,096	3,032	3,788	1.25
Dodecylbenzenesulfonic acid, isopropylamine salt	4,845	3,949	3,462	.88

See footnotes at end of table.

Table 36—Continued
 Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Anionic—Continued				
Sulfonic acids (and salts thereof)—Continued				
Alkylbenzenesulfonates—Continued				
Dodecylbenzenesulfonic acid, (mixed alkyl)				
amine salt	279	102	138	\$1.36
Docecylbenzenesulfonic acid, sodium salt	267,804	74,768	48,862	.65
Dodecylbenzenesulfonic acid, triethanolamine salt	13,335	13,005	7,213	.55
All other alkylbenzene sulfonates	166,815	2,569	2,296	.09
Benzene-, cumene-, toluene-, and xylenesulfonates,				
total	157,912	135,056	30,777	.23
Xylenesulfonic acid, ammonium salt	12,498	12,242	3,069	.25
Xylenesulfonic acid, sodium salt	107,839	101,176	21,051	.21
All other benzene-, cumene-, toluene-, and xylenesulfonates	37,575	21,638	6,657	.31
Ligninsulfonates and naphthalenesulfonates, total				
	1,095,083	1,066,062	104,493	.10
Disopropyl naphthalenesulfonic acid, sodium salt	1,605	1,390	2,569	1.85
Ligninsulfonic acid, ammonium salt	3,424	5,844	486	.08
Ligninsulfonic acid, calcium salt	556,050	530,435	24,603	.05
Ligninsulfonic acid, sodium salt	178,360	178,013	24,177	.14
All other ligninsulfonates and naphthalene-sulfonates	355,644	350,580	52,658	.15
Sulfosuccinic acid derivatives	3,491	3,396	2,344	.69
Sulfonic acids having ester or ether linkages, total				
	171,156	57,092	51,706	.91
Sulfosuccinic acid esters, total	32,543	27,186	28,109	1.03
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	24,615	20,478	21,614	1.06
Sulfosuccinic acid, monoalureth ester disodium salt	288	288	379	1.31
All other sulfosuccinic acid esters	7,640	6,420	6,116	.95
All other sulfonic acids having ester or ether linkages	138,613	29,906	23,597	.79
All other sulfonic acids (and salts thereof)	38,926	33,976	28,040	.83
Sulfuric acid esters (and salts thereof), total⁴				
	941,514	271,091	146,196	.54
Acids, amides, and esters, sulfated, total				
	8,799	6,121	4,765	.78
Butyl oleate, sulfated, sodium salt	1,390	1,291	664	.51
All other acids, amides, and esters, sulfated	7,409	4,830	4,101	.85
Alcohols, sulfated, total				
	401,422	90,700	62,403	.69
Decyl sulfate, sodium salt	1,308	605	441	.55
Dodecyl sulfate, ammonium salt	30,145	16,397	8,061	.49
Dodecyl sulfate, magnesium salt	(⁵)	51	81	1.59
Dodecyl sulfate, sodium salt	24,282	23,991	22,939	.96
Dodecyl sulfate, triethanolamine salt	5,261	3,817	3,100	.81
2-Ethylhexyl sulfate sodium salt	1,697	1,669	2,168	1.30
Mixed linear alcohols, sulfated, triethanolamine salt	17,939	6,760	5,504	.81
All other alcohols, sulfated	320,790	37,210	20,109	.54
Ethers, sulfated, total⁶				
	504,065	150,974	61,839	.41
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	858	858	797	.93
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	8,956	8,956	10,640	1.19
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	222,616	38,222	19,973	.52
All other ethers, sulfated ⁶	271,635	102,938	30,429	.30
Natural fats and oils, sulfated, total				
	27,228	23,296	17,189	.74
Castor oil, sulfated, sodium salt	3,915	3,777	3,142	.83
Tall oil, sulfated, sodium salt	208	112	60	.53

See footnotes at end of table.

Table 36—Continued
 Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Anionic—Continued				
Sulfuric acid esters (and salts thereof)—Continued				
Natural fats and oils, sulfated—Continued				
Tallow, sulfated, sodium salt	472	362	218	\$.60
All other natural fats and oils, sulfated	22,633	19,045	13,769	.72
Cationic				
Total	703,209	402,672	381,109	.95
Amine oxides and oxygen-containing amines (except those having amide linkages), total				
	177,176	58,777	49,567	.84
Acyclic, total				
	168,481	52,498	42,976	.82
N,N-Bis(2-hydroxyethyl)octadecylamine	159	110	154	1.41
N,N-Bis(2-hydroxyethyl) (tallow alkyl) amine	6,470	4,049	3,562	.88
(Coconut oil alkyl) amine, ethoxylated	5,158	4,729	2,862	.61
(Hydrogenated tallow alkyl) amine, ethoxylated	966	903	724	.80
(9-Octadecenyl) amine, ethoxylated	2,111	1,954	1,487	.76
Octadecylamine, ethoxylated	1,175	1,036	1,985	1.92
(Soybean oil alkyl) amine, ethoxylated	190	313	392	1.25
(Tallow alkyl) amine, ethoxylated	7,933	7,402	6,080	.82
N-(tallow alkyl) trimethylene diamine, ethoxylated	1,521	1,452	1,399	.96
All other acyclic	142,798	30,550	24,331	.80
Cyclic (Including imidazoline and oxazoline derivatives), total				
	8,695	6,279	6,591	1.05
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	1,077	1,071	1,505	1.40
1-(2-Hydroxyethyl)-2-nor (tall oil alkyl)-2-imidazoline	(^e)	320	524	1.64
All other cyclic (including imidazoline and oxazoline derivatives)	7,618	4,888	4,562	.93
Amines and amine oxides having amide linkages				
	58,057	40,472	31,132	.77
Amines, not containing oxygen (and salts thereof), total				
	230,853	87,991	75,133	.85
Amine salts, diamines and polyamines				
	33,250	23,553	17,375	.74
Monoamines, total				
	197,603	64,438	57,758	.90
(Hydrogenated tallow alkyl) amine	7,578	3,741	2,588	.69
9-Octadecenylamine	9,751	4,228	3,400	.80
(Soybean oil alkyl) amine	4,227	(^e)	(^e)	(^e)
All other monoamines	176,047	56,469	51,770	.92
Quaternary ammonium salts, containing oxygen, total				
	42,446	37,313	38,066	1.02
(Coconut oil alkyl)-bis-(2-hydroxyethyl, ethoxylated)-methylammonium chloride				
	279	249	296	1.19
All other quaternary ammonium salts, containing oxygen	42,167	37,064	37,770	1.02
Quaternary ammonium salts, not containing oxygen, total				
	182,299	167,373	154,941	.93
Acyclic, total				
	158,735	149,024	136,554	.92
Bis (coconut oil alkyl) dimethylammonium chloride	3,500	3,348	4,194	1.25
Bis (hydrogenated tallow alkyl) dimethylammonium chloride	79,222	78,358	55,440	.71
N-(coconut oil alkyl) aminobutyric acid, sodium salt	2,494	2,473	3,631	1.47
Hexadecyltrimethyl ammonium bromide	(^e)	90	307	3.41
Trimethyl (tallow alkyl) ammonium chloride	4,268	3,298	2,737	.83
All other acyclic	69,251	61,457	70,245	1.14
Benzenoid, total^a				
	23,564	18,349	18,387	1.00
Benzyl dimethyl (mixed alkyl) ammonium chloride	6,787	5,834	7,351	1.26

See footnotes at end of table.

Section 12

Table 36—Continued

Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Cationic—Continued				
Quaternary ammonium salts, not containing oxygen—Continued				
Benzenoid—Continued				
Benzyltrimethylammonium chloride	1,227	599	586	\$.98
Benzyltrimethylammonium chloride	3,985	2,423	1,942	.80
All other benzenoid	11,565	9,493	8,508	.90
All other cationic surface-active agents	12,378	10,746	32,270	3.00
Nonionic				
Total	2,012,199	1,745,177	1,252,392	.72
<hr/>				
Carboxylic acid amides, total	186,658	145,902	61,082	.42
<hr/>				
Diethanolamine codensates (amine/acid Ratio = 2/1), total	16,860	14,817	11,214	.76
Coconut oil acids	3,635	3,326	2,455	.74
Coconut oil and tallow acids	6,761	6,761	5,273	.78
Lauric and myristic acids	322	296	320	1.08
Oleic acid	771	646	503	.78
Stearic acid	46			
Tall oil acids	2,309	983	651	.66
All other diethanolamine condensates (amine/acid Ratio = 2/1)	3,016	2,805	2,012	.72
Diethanolamine condensates (other amine/acid ratios), and other carboxylic acid amides, total	169,798	131,085	49,868	.38
Coconut oil acids (amine/acid Ratio = 1/1)	28,513	25,367	15,997	.63
Coconut oil acid-ethanolamine condensate (amine/acid ratio = 1/1)	2,472	2,752	1,669	.61
Coconut oil acid-ethanolamine condensate (amine/acid ratio = 1/1), ethoxylated	476	440	332	.75
Lauric acid (amine/acid Ratio = 1/1)	1,908	1,819	1,835	1.01
Lauric and myristic acids (amine/acid Ratio = 1/1)	1,050	1,051	933	.89
Linoleic acid (amine/acid Ratio = 1/1)	117	110	152	1.38
Stearic acid (amine/acid Ratio = 1/1)	114	102	97	.95
All other diethanolamine condensates (other amine/acid ratios), and other carboxylic acid amides	135,148	99,444	28,853	.29
Carboxylic acid esters, total	421,591	341,528	483,391	1.42
<hr/>				
Anhydrosorbitol esters, total	117,198	118,588	299,314	2.52
Anhydrosorbitol monolaurate	6,511	6,546	5,065	.77
Anhydrosorbitol monostearate	61,651	63,022	12,308	.20
Anhydrosorbitol sesquiolate	1,040	1,073	970	.90
Anhydrosorbitol trioleate	1,971	1,995	1,522	.79
All other anhydrosorbitol esters	46,025	46,012	279,449	6.07
Diethylene glycol esters, total	5,481	2,728	1,908	.70
Diethylene glycol monolaurate	222	222	176	.79
Diethylene glycol monostearate	68	68	76	1.10
All other diethylene glycol esters	5,191	2,438	1,656	.68
Ethoxylated sorbitol and anhydrosorbitol esters, total	32,766	31,100	27,655	.89
Ethoxylated anhydrosorbitol monolaurate	7,343	7,080	6,690	.94
Ethoxylated anhydrosorbitol mono-oleate	3,950	4,126	3,354	.81
Ethoxylated anhydrosorbitol monostearate	13,020	11,631	9,825	.84
Ethoxylated anhydrosorbitol trioleate	3,065	3,106	2,572	.83
Ethoxylated anhydrosorbitol tristearate	748	717	649	.91
All other ethoxylated sorbitol and anhydrosorbitol esters	4,640	4,440	4,565	1.03

See footnotes at end of table.

Table 36—Continued
 Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Nonionic—Continued				
Carboxylic acid esters, total—Continued				
Ethylene glycol distearate	3,586	3,624	2,554	\$.70
Ethylene glycol monostearate	3,607	3,343	2,529	.76
Glycerol esters, total	101,105	68,104	58,026	.85
Glycerol mono-oleate	3,852	3,633	3,418	.94
Glycerol monostearate	21,662	11,964	9,969	.83
All other glycerol esters	75,591	52,507	44,639	.85
Natural fats and oils, ethoxylated, total	33,301	24,899	19,925	.80
Castor oil, ethoxylated	14,155	9,768	6,893	.71
Hydrogenated castor oil, ethoxylated	3,453	3,213	3,099	.96
Lanolin, ethoxylated	1,012	992	765	.77
All other natural fats and oils, ethoxylated	14,681	10,926	9,168	.84
Polyethylene glycol esters, total	60,006	49,959	40,446	.81
Polyethylene glycol diester of tall oil acids	4,296	910	633	.70
Polyethylene glycol dilaurate	1,348	1,217	1,083	.89
Polyethylene glycol dioleate	4,340	2,757	2,601	.94
Polyethylene glycol distearate	2,472	2,404	2,998	1.25
Polyethylene glycol monolaurate	7,608	7,587	5,304	.70
Polyethylene glycol mono-oleate	5,020	4,787	3,485	.73
Polyethylene glycol monopalmitate	1,362	1,495	1,461	.98
Polyethylene glycol monopelargonate	3,594	(⁵)	(⁵)	(⁵)
Polyethylene glycol monostearate	6,100	6,079	5,152	.85
Polyethylene glycol sesquiester of tall oil acids	1,808	1,829	1,139	.62
All other polyethylene glycol esters	22,058	20,904	16,590	.79
Polyglycerol esters, total	1,168	1,223	1,838	1.50
Polyglycerol mono-oleate	690	690	938	1.36
All other polyglycerol esters	478	533	900	1.69
1,2-Propanediol monostearate	1,602	1,097	1,418	1.29
All other carboxylic acid esters	61,771	36,853	27,778	.76
Ethers, total	1,382,096	1,247,847	690,459	.55
Benzenoid ethers, total⁴				
Dinonylphenol, ethoxylated	525,289	463,559	267,749	.58
Dodecylphenol, ethoxylated	4,307	3,539	3,507	.99
Iso-octylphenol, ethoxylated	10,457	9,745	6,352	.65
Iso-octylphenol, ethoxylated	(⁵)	41,681	37,780	.91
(Mixed alkyl)phenol-formaldehyde, alkoxylated	10,589	(⁵)	(⁵)	(⁵)
Nonylphenol, ethoxylated	393,396	346,726	181,313	.52
Nonylphenol, ethoxylated and propoxylated	1,233	1,068	821	.77
Nonylphenol-formaldehyde, alkoxylated	5,216	(⁵)	(⁵)	(⁵)
n-Octylphenol, ethoxylated	1,598	1,292	906	.70
All other benzenoid ethers	98,493	59,508	37,070	.62
Nonbenzenoid ethers, total	766,297	721,126	366,855	.51
Chemically-defined linear alcohols, ethoxylated, total	32,094	24,386	22,859	.94
Decyl alcohol, ethoxylated	12,481	8,866	6,379	.72
Dodecyl alcohol, ethoxylated	5,079	4,289	3,497	.82
9-Octadecenyl alcohol, ethoxylated	2,645	1,780	2,005	1.13
Oleyl alcohol, ethoxylated	1,142	1,025	1,357	1.32
All other chemically-defined linear alcohols, ethoxylated	10,747	8,426	9,621	1.14
Mixed linear alcohols, alkoxylated, total	734,203	696,740	343,996	.49
Mixed linear alcohols, ethoxylated	641,625	632,100	311,082	.49
Mixed linear alcohols, ethoxylated and propoxylated	24,714	23,039	17,226	.75
All other mixed linear alcohols, alkoxylated	67,864	41,601	15,688	.38

See footnotes at end of table.

Table 36—Continued

Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Nonionic—Continued				
Ethers—Continued				
Other ethers and thioethers, total	90,510	63,162	55,855	\$.88
Mixed alcohols, ethoxylated	1,117	647	536	.83
Poly(mixed ethylene, propylene) glycol	15,172	5,189	4,302	.83
Tridecyl alcohol, ethoxylated	10,939	9,211	6,113	.66
All other ethers and thioethers	63,282	48,115	44,904	.93
All other nonionic surface-active agents	21,854	9,900	17,460	1.76

¹ All quantities are given in terms of 100 percent organic surface-active ingredient.

² Sales include products sold as bulk surface-active agents only.

³ Calculated from unrounded figures.

⁴ The term "benzenoid" used in this report, describes any surface-active agent, except lignin derivatives, whose molecular structure includes 1 or more 6-membered carbocyclic or heterocyclic rings with conjugated double bonds (e.g., the benzene ring or the pyridine ring).

⁵ Reported data were accepted in confidence and may not be published, or no data were reported.

⁶ Includes all other anionic surface-active agents.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 37

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Amphoteric		
1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolinium chloride, disodium salt	No	BRD.
Bis(2-hydroxyethyl)tallowammonium ethanoate	No	MIR.
Capramldopropyl betaine	No	AAC.
3-[Caprylamidoethylene-(2-hydroxyethyl)amino]-propionic acid	No	MIR.
Caprylamphopropionate	No	MOA.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
(1-Carboxyheptadecyl)trimethylammonium hydroxide, inner salt	No	DUP.
Carboxymethyl-3-cocoamidopropyl dimethyl ammonium chloride, sodium salt	No	ENJ.
(Carboxymethyl)[3-(coconut oil amido)propyl]-dimethylammonium hydroxide, inner salt	Yes	AAC, GAF, MIR, PPG, SBC, SCP, SHX, WM, WTC.
1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2, imidazolinium hydroxide sodium derivative, sodium salt	No	BRD.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	BRD, MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
(Carboxymethyl)-3-(lauryl amido propyl dimethyl ammonium hydroxide inner salt	No	MIR, PPG.
(1-Carboxyundecyl)trimethylammonium hydroxide, inner salt	No	(?).
Cocoamidoamphoglycinate	No	MOA.
Cocoamidopropyl betaine	No	MOA.
N-Cocoamidopropyl-N,N-dimethylamine oxide	No	MOA.
3-[3-(Cocoamidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	No	MIR.
3-Cocoamidopropyl-2-hydroxy-3-sulfopropyl dimethyl ammonium hydroxide, inner salt	No	SCP, SHX.
Cocoamphocarboxyglycinate	No	MOA.
Cocoamphocarboxypropionate	No	MOA.
Cocoamphopropionate	No	MOA.
N-(Coconut oil alkyl)-β-alanine, partial sodium salt	No	SCP.
N-(Coconut oil alkyl)-β-alanine, sodium salt	No	DUP.
3-[(Coconut oil alkyl)amidoethylene-(2-hydroxyethyl)-amino]propionic acid	No	MIR.
N,N-di(hydroxyethyl)-n-carboxymethyl tallow ammonium quat, inner salt	No	SHX.

See footnotes at end of table.

Section 12

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Amphoteric—Continued		
Dodecyl disodium banaline, N-(2-carboxyethyl), sodium salt	No	GAF.
N-Dodecyl-3-iminodipropionic acid	No	MOA, SCP.
N-Dodecyl-3-iminodipropionic acid, disodium salt	Yes	AAC, MIR, MOA, SCP.
N-Dodecyl-3-iminodipropionic acid, monosodium salt	No	MIR.
Heptadecylmethylbenzimidazolinesulfonic acid, sodium salt	No	BRD.
Hexylsolanonylamidocarboxylic acid, monoethanolamine salt	No	HCL.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl)-2-capryl-2-imidazolium hydroxide	No	MIR.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	No	MIR.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl)-2-oleyl-2-imidazolium hydroxide	No	MIR.
1-(2-Hydroxyethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	No	MIR.
Isodecyloxypropyliminopropionic acid, monosodium salt	No	ENJ.
Isononylamidocaprolic acid, triethanolamine salt	No	SHX.
Isostearic amphopropionate	No	MOA.
Laurylamidopropyl betaine	No	MOA.
Laurylamphoglycinate	No	MOA.
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	No	RH.
(Mixed alkyl)sulfobetaine	Yes	BRD, MOA, PPG, SBC, WM, (2).
Oleamidopropyl betaine	No	AAC.
Oleic acid-ethylenediamine condensate, propoxylated and sulfated, sodium salt	No	MOA.
Oleyl betaine	No	SCP.
1-(Sodium carboxyethylene)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(tall oil fatty acids)-2-imidazolium hydroxide	No	MIR.
1-(Sodium carboxymethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(coconut oil fatty acids)-2-imidazolium lauryl sulfate	No	MIR.
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	Yes	MIR, MOA, SCP.
Tridecyloxypoly(ethyleneoxy)propionic acid, potassium salt	No	MRV.
All other acyclic amphoteric surface-active agents	No	BRD, CGY, DUP, MIR, MOA, PPG, S, (2).
All other cyclic amphoteric surface-active agents	No	PPG, SBC, SCP.
Anionic		
Carboxylic acids (and salts thereof):		
Amine salts of fatty, rosin, and tall oil acids:		
Coconut oil acids, diethanolamine salt	No	AAC, SHX.
Coconut oil acids, ethanolamine salt	No	SBP.
Isostearic acid, mixed isopropanolamines salt	No	(2).
Isostearic acid, triethanolamine salt	No	PCI.
Oleic acid, diethanolamine salt	No	AAC.
Oleic acid, mixed isopropanolamine salt	No	UTC, (2).
Oleic acid, triethanolamine salt	No	CCL, CPC, (2).
3-Propanoic acid, cocoamine, sodium salt	No	PCI.
Rosin acids, triethanolamine salt	No	CPC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 38)
Anionic—Continued		
Carboxylic acids (and salts thereof)—Continued		
Amine salts of fatty, rosin, and tall oil acids—Continued		
Stearic acid, N,N,N',N'-tetrakis(2-hydroxyethyl)-ethylenediamine salt	No	ICI.
Stearic acid, triethanolamine salt	Yes	AAC, BRD, PCI, SBP, (2).
Tall oil acids, diethanolamine salt (condensate)	No	AAC, SHX.
Tall oil acids, triethanolamine salt	No	PNX.
(Tall oil fatty acids), triethanolamine salt	No	WVA.
Tallow acids, triethanolamine salt	No	CPC, ENJ, SBP.
All other amine salts of fatty, rosin, and tall oil acids	No	S, (2).
Carboxylic acids having amide, ester, or ether linkages:		
Butoxyethylene oxyacetic acid, sodium salt	No	MIR.
5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, reaction products with castor oil	No	(2).
N-(Coconut oil acyl)sarcosine, sodium salt	No	ENJ, HMP.
N,N-Dimethyl capramide	No	PEL.
Dodecyloxypoly(ethyleneoxy)acetic acid, sodium salt	No	MIR.
N-Lauroylsarcosine, sodium salt	No	AAC, HMP.
Maleic acid, monoalkyl ester	No	(2).
Mixed(secondary linear alcohol)polyethylene propionic acid, sodium salt	No	CHP.
Naphthenic acid, ethoxylated	No	(2).
Nonylphenol poly(ethyleneoxy)acetic acid, sodium salt	No	BRI.
Poly(oxy-1,2-ethanediy), ω -(2-carboxyethoxy)- ω '-hydroxy- α , α '-(iminodi-2,1-ethanediy)-bis-, N-tallow alkyl derivs), potassium salt	No	MIR.
Poly(oxy-1,2 ethanediy)- α -carboxy-methyl, ω -(tri-decyloxy), potassium salt	No	PCI.
Tridecyloxypoly(ethyleneoxy)acetic acid, sodium salt	No	FTX, HCL, HMP, S.
All other carboxylic acids with amide, ester or ether linkage	No	S, SCP.
Potassium and sodium salts of fatty, rosin, and tall oil acids:		
Alkoxy triacryl titanate	No	KPI.
Animal grease, sodium salt	No	NMC.
5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, potassium/sodium salts	No	(2).
Castor oil acids, potassium salt	No	CAS, GRL.
Citric acid, sodium salts (50%) in sodium phosphates (20%)	No	HCL.
Coconut oil acids and oleic acid, potassium salt	No	HCL.
Coconut oil acids, potassium salt	Yes	AGP, CON, ESS, GRL, HEW, HIP, HNT, LUR, NMC, PG, PNX.
Coconut oil acids, sodium salt	Yes	BSW, CON, CP, ENJ, HEW, LEV, NMC, NPR, PG, (2).
Corn oil acids, potassium salt	No	HNT, NMC.
Gluconic acid, potassium and sodium salts with 20 percent mix of sodium bisulfite-formaldehyde	No	HCL.
Heptanoic acid, potassium salt	No	(2).
Hexyl(isonanoyl anide)carboxylic acid, mono, triethanolamine salts	No	HCL.

See footnotes at end of table.

Section 12

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Carboxylic acids (and salts thereof)—Continued		
Potassium and sodium salts of fatty, rosin, and tall oil acids—Continued		
Hexyl(isononyl anide) carboxylic acid, triethanol- diethanolamine, mixed salts	No	HCL.
Isononyl acid, sodium salt	No	HCL.
Isostearic acid, isoproxy titanium salt	No	KPI.
Lauric acid, potassium salt	No	PG.
Mixed vegetable fatty acids, potassium salt	No	EFH, GRL.
Mixed vegetable fatty acids, sodium salt	No	NMC.
Mixed wool grease and tall oil fatty acids	No	SLM.
Neoalkoxy, trineodecanoyl titanate	No	KPI.
Neoalkoxy, trineodecanoyl zirconate	No	KPI.
Oleic acid, ammonium salt	No	CCC.
Oleic acid, potassium salt	No	BSW, CPC, HAL, HNT, PG, VKR, (²).
Oleic acid, sodium salt	Yes	BSW, HAL, SCP.
Olive oil acids, sodium salt	No	HNT.
Palmitic and stearic acids, sodium salt	No	BRI.
Palm kernel oil acids, potassium salt	No	PG.
Palm kernel oil acids, sodium salt	No	NMC, PG.
Palm oil acids, sodium salt	No	BSW.
Rosin acids, potassium salt	Yes	ARZ, PG, WVA, (²).
Rosin acids, sodium salt	No	ARZ, SLM, (²).
Stearic acid, ammonium salt	No	BSW.
Stearic acid, potassium salt	Yes	AAC, CON, HEW, PNX.
Stearic acid, sodium salt	No	CON, LEV, NOC.
Tall oil acids, mixed salts	No	WVA.
Tall oil acids, potassium salt	Yes	CCC, CON, DAN, ESS, FER, HIP, HNT, PNX, WVA.
Tall oil acids, sodium salt	No	CON, NMC, WVA, (²).
Tallow acids, potassium salt	No	AGP, PG, PNX.
Tallow acids, sodium salt	No	BSW, CON, CP, HEW, LEV, NMC, NPR, PG, (²).
All other potassium and sodium salts of fatty, rosin, and tall oil acids	No	MOA, QCP, USR.
Other carboxylic acids:		
All other carboxylic acids	No	WVA.
Phosphoric and polyphosphoric acid esters (and salts thereof):		
Alcohols and phenols, alkoxylated and phosphated:		
C ₁₂ -C ₁₆ alcohol, ethoxylated, propoxylated and phosphated	No	GAF.
Butyl alcohol, ethoxylated and phosphated	No	GAF.
Decyl alcohol, ethoxylated and phosphated	Yes	BRI, GAF, MCP, OC, RPC, TCH.
Decyl alcohol, ethoxylated and phosphated, potassium salt	No	BRI.
Dinonylphenol, ethoxylated and phosphated	Yes	CPC, ETC, GAF, PPG, WTC.
Dodecyl alcohol, ethoxylated and phosphated	No	CPC, ENJ, GAF, HCL, VKR.
Dodecyl alcohol, ethoxylated and polyphosphated	No	PG.
Dodecylphenol, ethoxylated and phosphated	No	GAF.
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated	No	CCC.
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated, sodium salt	No	CCC.
2-Ethylhexanol, ethoxylated and phosphated	No	ETC, HCL, SCP, UTC.
2-Ethylhexanol, ethoxylated, phosphated, potassium salt	No	BRI.
Meta, para-cresol, ethoxylated and polyphosphated, neutralized	No	GAF.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued		
Alcohols and phenols, alkoxylated and phosphated—Continued		
Mixed linear alcohols, alkoxylated and phosphated, potassium salt	No	PCI.
Mixed linear alcohols, ethoxylated and phosphated	Yes	AAC, CRT, ENJ, ETC, FER, FTX, GAF, HCL, HIP, HRT, LUR, MOA, MRV, PPG, RPC, TCH, VKR, WTC, (2), (2).
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	No	CHP.
Nonylphenol, ethoxylated and phosphated	Yes	AAC, ARL, CPC, CRT, CTL, DEX, ESS, ETC, GAF, GDC, HCL, HRT, LUR, MCP, MOA, OC, OMC, PEL, PPG, RPC, TCC, UTC, VKR, WTC.
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	No	OMC, WTC.
Nonylphenol, ethoxylated and phosphated, sodium salt	No	WTC.
9-Octadecenyl alcohol, ethoxylated and phosphated	No	ETC, GAF, HCL, PPG.
Octylphenol, ethoxylated and phosphated	Yes	LUR, PPG, RH, RPC, WTC.
Octylphenol, ethoxylated and phosphated, magnesium salt	No	CTL.
Phenol, ethoxylated and phosphated	Yes	ETC, GAF, LUR, MOA, PEL, PPG, WTC.
Phenol, ethoxylated and phosphated, diethanolamine salt	No	AAC.
Polyhydric alcohol, ethoxylated and phosphated	No	DEX, GAF.
Tridecyl alcohol, ethoxylated and phosphated, polyalkylene polyamine salt	No	(2).
Tridecyl alcohol, ethoxylated and phosphated	Yes	CCL, DAN, DEX, ETC, GAF, HCL, HIP, MIL, VKR, WTC, (2), (2).
All other alcohols and phenols, alkoxylated and phosphated or polyphosphated	No	DEX, ETC, PPG, SCP.
Alcohols, phosphated or polyphosphated:		
Butoxyethyl phosphate	No	AAC.
Butyl methyl pyrophosphate, ethylenedioxy titanium salt/N,N-dimethylaminoethylmethacrylate salt	No	KPI.
Butyl methyl pyrophosphate, isopropoxy titanium salt, octyl phosphite adduct	No	KPI.
Butyl phosphate	No	HRT.
Butyl phosphate, potassium salt	No	DUP.
Decyl and octyl phosphate	Yes	APC, ENJ, ETC, HCL, SCP, SHX.
Decyl polyphosphate, sodium salt	No	CRD.
Ethyl alcohol, phosphated, amine salt	No	UTC.
2-Ethylhexyl phosphate	No	APC, BRD, CHP, ETC, FER, FTX, GAF, HIP, MCP, OC, OMC, PPG, VKR.
2-Ethylhexylphosphate, potassium salt	No	PCI.
2-Ethylhexylphosphate, sodium salt	No	CHP, DAN, ENJ, PAT, S.
2-Ethylhexylpolyphosphate, sodium salt	No	DEX.
Hexadecylphosphate	No	(-).
Hexadecylmonophosphate	No	(2).
Hexyl phosphate	No	ETC, FTX, HCL, ICI.
Hexyl phosphate, potassium salt	No	ICI.
Alcohols, phosphated or polyphosphated:		
N-2-(C ₂ to C ₁₇)alkylamido-N-carboxyethyl, N-2-hydroxyethyl, 3-amino-2-hydroxypropyl phosphate, disodium salt	No	MOA.
Isooctyl phosphate	No	BOE, BRI, QCP.

See footnotes at end of table.

Section 12

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued		
Alcohols, phosphated or polyphosphated—Continued		
Isooctyl phosphate, potassium salt	No	BRI.
Methylbutyl pyrophosphate, ethylenedioxy titanium salt	No	KPI.
Mixed alkyl phosphate, sodium salt	No	(²).
Mixed alkyl phosphate	Yes	CTL, DUP, HCL, OC, TCH, WTC, (²).
Mixed alkyl phosphate, alkylamine salt	No	(²).
Mixed alkyl phosphate, diethanolamine salt	No	DUP, SCP.
Mixed alkyl phosphate, potassium salt	No	HCL.
Mixed alkyl phosphate, triethanolamine salt	No	(²).
Neoalkoxy tris (dioctyl) pyrophosphato zirconate	No	KPI.
Octyl diphosphate, oxoethylene titanium salt	No	KPI.
Octyl phosphate, alkylamine salt	No	(²).
Octyl phosphate, isoproxy titanium salt	No	KPI.
Octyl phosphate neoalkoxy titanium salt	No	KPI.
Octyl polyphosphate	No	DEX.
Octyl polyphosphate, potassium salt	No	DEX.
Octyl pyrophosphate, ethylenedioxy titanium salt	No	KPI.
Octyl pyrophosphate, ethylenedioxy titanium salt/dimethylamino methacrylate salt	No	KPI.
Octyl pyrophosphate, isoproxy titanium salt	No	KPI.
Octyl pyrophosphate neoalkoxy titanium salt	No	KPI.
Octyl pyrophosphate, oxoethylenedioxy titanium salt	No	KPI.
Tridecyl phosphate	No	HCL.
Other phosphoric and polyphosphoric acid esters:		
Blend of fatty and phosphate esters	No	MIL.
Glycerol, ethoxylated and phosphated	No	(²).
Glycerol monoester of mixed fatty acids, phosphated	No	WTC.
Polyoxyalkylate (fatty alcohol), phosphate ester	No	BAS.
Stearyl amine polyphosphoric acid, ethoxylated	No	GDC.
All other phosphoric and polyphosphoric acid esters	No	ENJ, MOA, WTC.
Sulfonic acids (and salts thereof):		
Alkylbenzenesulfonates:		
Dodecylbenzenesulfonates:		
Dodecylbenzenesulfonic acid	Yes	AAC, EMK, ENJ, JLP, LEV, PIL, PLX, STP, TEN, VST, WTC, (²).
Dodecylbenzenesulfonic acid, ammonium salt	No	CCC, LEV, (²).
Dodecylbenzenesulfonic acid, calcium salt	Yes	HCL, ICI, RH, STP, TMH, WTC, (²).
Dodecylbenzenesulfonic acid, diethanolamine salt	No	AAC.
Dodecylbenzenesulfonic acid, ethylenediamine salt	No	TCH.
Dodecylbenzenesulfonic acid, isopropanolamine salt	No	PIL, (²).
Dodecylbenzenesulfonic acid, isopropylamine salt	Yes	CIN, ICI, KPI, PPG, STP, TCH, WTC, (²).
Dodecylbenzenesulfonic acid, (mixed alkyl) amine salt	Yes	ECC, FTX, HCL, HIP, (²).
Dodecylbenzenesulfonic acid, monoethanolamine salt	No	AAC, RPC.
Dodecylbenzenesulfonic acid, oleyl amine, ethoxylated, salt	No	HCL.
Dodecylbenzenesulfonic acid, potassium salt	No	BRI, GDC, MRV.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Sulfonic acids (and salts thereof)—Continued		
Alkylbenzenesulfonates—Continued		
Dodecylbenzenesulfonates—Continued		
Dodecylbenzenesulfonic acid, sodium salt	Yes	AAC, APC, BLA, BOE, BRI, CP, CPC, CRT, CTL, DOW, DUP, ECC, JLP, LEV, NMC, PCI, PG, PIL, PLX, PNX, STP, TEN, VKR, VST, WTC.
Dodecylbenzenesulfonic acid, triethanolamine salt	Yes	AAC, BRD, BRI, CCC, CPC, CTL, ESS, FTX, MRV, PCI, PIL, STP, WTC. ENJ.
All other dodecylbenzene sulfonates	No	
Other alkylbenzenesulfonates:		
Benzene sulfonic acid	No	WTC.
Neoalkoxy, dodecylbenzene-sulfonyl titanate	No	KPI.
Tridecylbenzenesulfonic acid	No	CP, PLX.
Tridecylbenzenesulfonic acid, sodium salt	No	BLA, CMT, CPC, NPR, PG.
Benzene-, cumene-, toluene-, and xylenesulfonates:		
Cumenesulfonic acid, ammonium salt	No	NES, SCP.
Cumenesulfonic acid, sodium salt	No	NES, STP, WTC.
Toluenesulfonic acid, potassium salt	No	NES.
Toluenesulfonic acid, sodium salt	No	NES, PG, VST.
Toluene xylene sulfonic acid	No	WTC.
Xylenesulfonic acid, ammonium salt	No	NES, PG, STP, WTC.
Xylenesulfonic acid, sodium salt	No	AAC, ICI, NES, PIL, SHC, STP, WTC.
All other benzene-, cumene-, toluene-, and xylenesulfonates	No	SCP.
Ligninsulfonates:		
Ligninsulfonic acid, ammonium salt	Yes	MAR, PSP, RAY, SPA.
Ligninsulfonic acid, calcium salt	Yes	FPC, LKY, MAR, PSP.
Ligninsulfonic acid, chromium salt	No	MAR, PSP, RAY.
Ligninsulfonic acid, iron salt	No	MAR, PSP.
Ligninsulfonic acid, magnesium salt	No	MAR, RAY.
Ligninsulfonic acid, mixed chromium and iron salts	No	PSP.
Ligninsulfonic acid, potassium salt	No	PSP.
Ligninsulfonic acid, sodium salt	Yes	MAR, PSP, WVA.
Ligninsulfonic acid, zinc salt	No	ENJ, MAR, PSP.
All other ligninsulfates	No	MAR.
Naphthalenesulfonates:		
Butylnaphthalenesulfonic acid, sodium salt	No	ECC, UDI.
Di(C ₆ -C ₈ alkyl)naphthalenesulfonic acid	No	(²).
Dibutylnaphthalenesulfonic acid	No	GAF, UDI.
Diisopropyl-naphthalenesulfonic acid, sodium salt	Yes	DUP, SCP, UDI.
Isopropyl-naphthalenesulfonic acid	No	UDI.
Methylnaphthalenesulfonic acid, sodium salt	No	CPC, UDI.
Methylnonylnaphthalenesulfonic acid, sodium salt	No	UDI.
Naphthalenesulfonic acid, sodium salt, formaldehyde condensate	No	ICI, UDI.
All other naphthalenesulfonates	No	HAL, TCH.
Sulfonic acids having amide linkages:		
Sulfosuccinamic acid derivatives:		
N-(1,2-Dicarboxylethyl)-N-octadecylsulfosuccinamic acid, tetrasodium salt	No	ACY, MOA.
N-Octadecylsulfosuccinamic acid, disodium salt	No	ACY.
Oleamidosulfosuccinamic acid, disodium salt	No	SBC.
N-(Oleoyloxyisopropyl)sulfosuccinamic acid	No	WTC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Sulfonic acids (and salts thereof)—Continued		
Sulfonic acids having amide linkages—Continued		
Taurine derivatives:		
N-(Coconut oil acyl)-N-methyltaurine, sodium salt . . .	No	FTX, GAF.
N-Cyclohexyl-N-palmitoyltaurine, sodium salt	No	GAF.
N-Methyl-N-oleoyltaurine, sodium salt	No	CPC, FTX, GAF, HCL.
N-Methyl-N-palmitoyltaurine, sodium salt	No	GAF.
N-Methyl-N-(tall oil acyl)taurine, sodium salt	No	CCC, GAF, WVA.
All other sulfonic acids having amide linkages	No	HCL.
Sulfonic acids having ester or ether linkages:		
Sulfosuccinic acid esters:		
Sulfosuccinic acid, bis (disobutyl) ester, amidodisodium salt	No	MOA.
Sulfosuccinic acid, bis (2,6-dimethyl-4-heptyl)-ester, sodium salt	No	MOA, NSC.
Sulfosuccinic acid, bis (2-ethylhexyl) ester, sodium salt	Yes	AAC, ACY, AMU, APX, BRI, CCC, CHP, CRT, ECC, EMK, ENJ, FTX, HCL, HDG, MCP, MOA, MRV, RH, RPC, WTC.
Sulfosuccinic acid, dhexyl ester, sodium salt	No	ACY, FTX, MOA.
Sulfosuccinic acid, disobutyl ester, sodium salt	No	FTX.
Sulfosuccinic acid, disodecyl ester, sodium salt	No	ACY.
Sulfosuccinic acid, disooctyl ester, sodium salt	No	ARI, SOS.
Sulfosuccinic acid, dioctyl ester, sodium salt	No	MOA.
Sulfosuccinic acid, dipentyl ester, sodium salt	No	ACY.
Sulfosuccinic acid, dtridecyl ester, sodium salt	No	ACY, MOA.
Sulfosuccinic acid, (lauryl polyethylene glycol ether) ester, disodium salt	No	SHX.
Sulfosuccinic acid, (coconut oil alkyl)-iminisopropanol half-ester, sodium salt	No	MOA.
Sulfosuccinic acid, lanolin ester, disodium salt	No	AAC.
Sulfosuccinic acid, lauramidomonoethanolamine, disodium salt	No	AAC.
Sulfosuccinic acid, monolaurate ester, disodium salt	Yes	AAC, MIR, MOA.
Sulfosuccinic acid, monooleamidopolyethyleneglycol ester, disodium salt	No	SCP.
Sulfosuccinic acid, myristyl ester, disodium monoethanolamine salt	No	WTC.
Sulfosuccinic acid, oleamidopolyethyleneglycol, disodium salt	No	MOA.
Sulfosuccinic acid, ricinoleamide monoethanolamine disodium salt	No	AAC.
All other sulfosuccinic acid esters	No	MOA, SHX, WTC.
All other sulfonic acids having ester or linkages:		
Coconut oil acids, 2-sulfoethyl ester, sodium salt . . .	No	FTX, GAF, HDG, LEV, PPG.
Dodecylphenyloxidedisulfonic acid	No	(?).
Dodecylphenyloxidedisulfonic acid, disodium salt . . .	No	CTL.
Dodecyl sulfoacetate, sodium salt	No	STP.
Glycerol monostearate sulfoacetate, sodium salt . . .	No	WTC.
Hexyloxypropanesulfonic acid, sodium salt	No	WTC.
2-Hydroxy, 3-(lauryl-myristyl) (oxy-1 propane sulfonic acid), sodium salt	No	PG.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Sulfonic acids (and salts thereof)—Continued		
Sulfonic acids having ester or ether linkages—Continued		
All other sulfonic acids having ester or linkages:—Cont.		
Iso-octylphenol, ethoxylated and sulfonated,		
sodium salt	No	GAF, RH.
Petroleum sulfonic acid, calcium salt	No	WTC.
All other sulfonic acids with ether linkages	No	PG.
Other sulfonic acids:		
Allyl sulfonate, sodium salt	No	ARD.
Diphenylsulfone sulfonic acid, potassium salt	No	UPF.
Mixed alkanesulfonic acid	No	(²).
Mixed alkane sulfonic acid, sodium salt	No	AAC, DUP, PPG, S, SLM, WTC, WVA, (²).
Mixed linear olefin sulfonate	No	STP.
n-Octanesulfonic acid, sodium salt	No	(²).
Petroleum sulfonic acid, water soluble (acid layer),		
sodium salt	No	PIL.
All other sulfonic acids	No	CGY, CLU, HAL.
Sulfuric acid esters (and salts thereof):		
Acids, amides, and esters, sulfated:		
Coconut oil acids—ethanolamine salt, sulfated,		
potassium salt	No	EMK, ENJ.
Mixed alkyl phenol sulfate, ethoxylated,		
triethanolamine salt	No	MIL:
Carboxylic acid esters (except natural fats and		
oils), sulfated:		
Esters of sulfated oleic acid:		
Butyl oleate, sulfated, sodium salt	Yes	HIP, ICI, LUR, MCP, MRV, NSC.
Isopropyl oleate, sulfated, sodium salt	No	DEX.
Methyl oleate, sulfated, sodium salt	No	ICI.
Oleic acid, sulfated	No	ACT.
Oleic acid, sulfated, disodium salt	No	MCP.
Oleic acid, sulfated, sodium salt	No	ACY, CIN.
Propyl oleate, sulfated, sodium salt	No	MRV.
Other sulfated esters:		
Glycerol monoester of coconut oil acids,		
sulfated, sodium salt	No	CP.
9-Octadecenyl acetate, sulfated, sodium salt	No	DUP.
Tall oil acids, oxobottom ester, sulfated,		
sodium salt	No	LUR.
Tall oil acids, sulfated, sodium salt	No	ICI.
Alcohols, sulfated:		
Decyl sulfate, sodium salt	Yes	ARI, SCP, WTC.
Dodecyl sulfate salts:		
Dodecyl sulfate, ammonium salt	Yes	AAC, BRD, LEV, STP, TNI, WTC, (²).
Dodecyl sulfate, diethanolamine salt	No	BRD, DUP, JRG, STP.
Dodecyl sulfate, N,N-diethylcyclohexylamine salt	No	DUP.
Dodecyl sulfate, isopropanolamine salt	No	JRG.
Dodecyl sulfate, magnesium salt	Yes	AAC, BRD, PG, STP.
Dodecyl sulfate, potassium salt	No	PG.
Dodecyl sulfate, sodium salt	Yes	AAC, BRD, DUP, STP, WTC.
Dodecyl sulfate, triethanolamine salt	Yes	AAC, BRD, STP, TNI.
3,9-Diethyl-6-tridecyl sulfate, sodium salt	No	NCC, SCP.
2-Ethylhexyl sulfate, sodium salt	Yes	AAC, BRD, NCC, PCI, WTC.
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	No	NCC.
Hexadecyl sulfate, sodium salt	No	AAC, MIL, SCP.
Mixed linear alcohols, sulfated, ammonium salt	No	AAC, CP, SCP, WTC, (²).
Mixed linear alcohols sulfated, mixed		
sodium/cocodiethanolamine salts	No	AAC.
Mixed linear alcohols, sulfated, sodium salt	No	DUP, PG, S, SCP, WTC.
Mixed linear alcohols, sulfated, triethanolamine salt	Yes	AAC, PG, SCP, WTC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Sulfuric acid esters (and salts thereof)—Continued		
Alcohols, sulfated—Continued		
Octyl sulfate, sodium salt	No	AAC, DUP.
Oleyl sulfate, sodium salt	No	DUP.
Oxalcohol bottoms, sulfated, sodium salt	No	WVA.
Tridecyl sulfate, sodium salt	No	AAC.
All other linear alcohols, sulfated	No	PG.
Ethers, sulfated:		
Alkylphenols, ethoxylated and sulfated:		
(Mixed alkyl)phenol, ethoxylated and sulfated, sodium salt	No	(²).
1-Naphthol, ethoxylated and sulfated, free acid	No	TCH.
Nonylphenol, ethoxylated and sulfated, ammonium salt	No	GAF, RPC, STP.
Nonylphenol, ethoxylated and sulfated, sodium salt	No	GAF, WTC.
Octylphenoxy polyethoxy ethyl sulfate	No	RH.
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	No	AAC, MOA, STP.
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	Yes	AAC, SCP, STP.
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, ammonium salt	No	PG, (²).
Isobutanol, ethoxylated and sulfated, ammonium salt	No	(²).
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	No	AAC, BRD, PG, SCP, SHC, STP, VST, WTC, (²), (²).
Mixed linear alcohols, ethoxylated and sulfated, diethanolamine salt	No	SCP.
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	Yes	AAC, BRD, DUP, GAF, PG, PIL, SCP, SHC, STP, VST, WTC, WVA.
Tridecyl alcohol, ethoxylated and sulfated, sodium salt	No	AAC, BRD.
All other sulfated ethers	No	PG, SHX.
Natural fats and oils, sulfated:		
Castor oil, sulfated, sodium salt	Yes	ACT, ACY, ARI, ARL, CRT, DEX, HIP, ICI, LUR, MRV, S, SCP, SLM, WHW.
Coconut oil, sulfated, sodium salt	No	ACY.
Cod oil, sulfated, sodium salt	No	WHW.
Grease, other than wool, sulfated, sodium salt	No	WHW.
Herring oil, sulfated	No	SLM.
Herring oil, sulfated, sodium salt	No	ARI, SLM, WHW.
Lard, sulfated, sodium salt	No	CIN, CRT, LUR, WHW.
Mixed animal and vegetable oil, sulfated, sodium salt	No	SLM.
Mixed fish oils, sulfated, ammonium salt	No	CIN.
Mixed fish oils, sulfated, sodium salt	No	SLM, WHW.
Mixed vegetable oils, sulfated, sodium salt	No	LUR.
Mixed vegetable oils, sulfated, sodium salt	No	CPC.
Neat's foot oil, sulfated, sodium salt	No	ARI, WHW.
Peanut oil, sulfated, sodium salt	No	ACY, LUR.
Pecan oil, sulfated, sodium salt	No	CRT.
Soybean oil, sulfated, sodium salt	No	ACT, WHW.
Sulfated animal fats and oils, all other	No	WVA.
Sulfated fish and marine fat oils, all other	No	ARI, LUR.
Synthetic fatty alcohol ester, sulfated, sodium salt	No	SLM.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Sulfuric acid esters (and salts thereof)—Continued		
Natural fats and oils, sulfated—Continued		
Tall oil, sulfated, ammonia salt	No	CIN.
Tall oil, sulfated, sodium salt	Yes	ACT, ARI, CIN, LUR, WTC.
Tallow, sulfated, sodium salt	Yes	ARI, CCC, LUR, NSC, WHW.
All other natural fats and oils, sulfated	No	TEN.
All other sulfuric acid esters	No	BFP, SCP.
Other anionic surface-active agents:		
Alkylalcohol ethoxylated and carbonated, sodium salt	No	MIL.
Ethoxylated acetic acid, sodium salt	No	S.
Half-phthalic acid ester of tallow		
alkanamide/monoglyceride	No	EFH.
Lignin, sodium salt	No	WVA.
Mixed alpha-olefins and vegetable	No	SLM.
Mixed linear alcohols, ethoxylated and carbonated, sodium salt	No	S.
Nonylphenol, ethoxylated and carbonated, sodium salt	No	WTC.
Tridecyl alcohol, ethoxylated and carbonated, sodium salt	No	S.
All other anionic surface-active agents	No	DUP, ENJ, MOA, S, WVA.
Cationic		
Amine oxides and oxygen-containing amines (except those having amide linkages):		
Acyclic:		
3-(C ₁₂ -C ₁₅ alkyloxy)-1-propanamine	No	ENJ.
3-(C ₁₂ -C ₁₉ alkyloxy)-1-propanamine	No	ENJ.
N-(C ₁₂ -C ₁₆ alkyl)oxypropyl trimethylene diamine	No	ENJ.
Bis-(2-hydroxyethyl)isodecylxypropylamine oxide	No	ENJ.
N,N-Bis(2-hydroxyethyl)octadecylamine	Yes	ARC, PPG, SHX.
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	Yes	ARC, ENJ, HCL, PPG, SHX.
tert-Butylbenzylamine	No	HXL.
Cocoamidopropyl dimethyl amine	No	PPG, (2).
(Coconut oil alkyl)amine, ethoxylated	Yes	ARC, ENJ, ETC, ICI, PPG, SHX, SVC, TCH, WTC, (2), (2).
(Coconut oil alkyl)amine, ethoxylated, acetate	No	BRD.
(Coconut oil alkyl)amine, ethoxylated and phosphated	No	(2).
Coconut oil alkyl amine, propoxylated	No	SHX.
Cocoyl amidopropyl dimethylamine oxide	No	SCP.
Diethylenetriamine, alkoxyated	No	(2).
N,N-Dimethyldodecylamine oxide	No	(2).
N,N-Dimethyldodecylamine oxide	No	CTL, PG, PPG, SHX, (2).
N,N-Dimethylhexadecylamine oxide	No	ARC, BRD, PG, PPG.
N,N-Dimethyl(mixed alkyl)amine oxide	No	S.
N,N-Dimethyl oleyl amide oxide	No	SCP.
Dimethyltetradecylamine oxide	No	(2).
Di(pyrrrolidonylethyl)imine	No	PCI.
Ethylene diamine, ethoxylated	No	KPI.
Hexyloxypropylamine	No	DUP, ENJ.
(Hydrogenated tallow alkyl)amine, ethoxylated	Yes	ARC, ENJ, ETC, SHX, WTC.
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl)-ethylenediamine	No	(2).
2-Imidazole-1-(2-aminoethyl)-2-(tall oil alkyl), ethoxylated	No	(2).

See footnotes at end of table.

Section 12

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Amine oxides and oxygen-containing amines (except those having amide linkages)—Continued		
Acyclic—Continued		
Isodecylxypropylamine	No	ENJ.
Isodecylxypropylamine, ethoxylated	No	ENJ.
3-(3-Isodecylxy)propylaminopropyl amine	No	SHX.
N-Isodecylxypropyl trimethylene diamine	No	ENJ.
Isodicycloxypropyl amine propoxylated acetate	No	SHX.
Isopropoxy-tris(2-ethylenediamino)ethyl titanate	No	
Isotrldcylxypropylamine	No	ENJ.
N-Isotrldcylxypropyl trimethylene diamine	No	ENJ.
3-(Mixed alkoxy)propylamine, ethoxylated oxldes	No	SHX.
3-(3-Mixed alkoxy)propylaminopropyl amine	No	SHX.
(Mixed alkyl)amine, ethoxylated	No	ICI, RH, SHX, (²).
Neoalkoxy, tri(m-amino)-phenyl titanate	No	KPI.
Neoalkoxy, tris(m-amino)-phenyl zirconate	No	KPI.
Neoalkoxy, tris(ethylenediamino)zirconate	No	KPI.
(9-Octadecenyl)amine, ethoxylated	Yes	ETC, GAF, HCL, SHX, TCH, (²).
Octadecylamine, ethoxylated	Yes	ARC, ETC, TCH, WTC.
Octyldimethylamine oxide	No	HNT.
Polyether amine, ethoxylated	No	RH.
Polyethylenepolyamine, alkoxyated	No	BAS.
Polyimine, propoxylated	No	TCH.
1,3-Propanediamine, alkoxyated	No	SHX.
(Soybean oil alkyl)amine, ethoxylated	Yes	ARC, ENJ, ETC, GAF, JTO, PPG, SHX.
(Tallow alkyl)amine, ethoxylated	Yes	ARC, BAS, DUP, ENJ, ETC, GAF, JTO, PPG, S, SHX, TCH, WTC, (²), (²).
N-(Tallow alkyl)trimethylenediamine, ethoxylated	Yes	RC, ENJ, ETC, GAF, JTO, (²).
[Tallow ethyl alkyl]amine, ethoxylated, sulfate	No	ETC, RPC.
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	No	PPG, (²).
N,N,N',N'-Tetrakis(2-Hydroxyethyl)ethylenediamine, propoxylated	No	HCL.
N,N,N',N'-Tetrakis(2-hydroxypropyl)-ethylenediamine, propoxylated and ethoxylated	No	BAS, PPG.
3-(3-Tridecylxy)propylaminopropyl amine	No	SHX.
Triethanolamine, ethoxylated	No	ETC, MIL, TCH.
Triethanolamine phosphate ester	No	(²).
Triethanolamine salicylate	No	RSA.
All other acyclic amine oxides and oxygen-containing amines (except those with amide linkages)	No	ARC, BAS, HIL, JTO, LUR, PG, SVC, WTC.
Cyclic:		
Aniline, ethoxylated	No	MIL.
2-Butenedioic acid-(ξ)-diamine-1-(2-aminoethyl)-2-(tall oil alkyl)-2-imidazoline condensate	No	(²).
2,5-Dimethoxyaniline, ethoxylated	No	MIL.
2-Heptadecyl-1,4-hydroxymethyl-4-ethyl-2-oxazoline	No	BRD.
N-Hexadecylmorpholine	No	BRD.
N-(2-Hydroxyethyl)-1,2-diphenylethylenediamine	No	MIR.
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	Yes	BRD, MIR, MOA, PPG, SHX, WTC.
1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2-imidazoline	No	BRD, FTX, MOA.
1-(2-Hydroxyethyl)-2-nor(soya oil alkyl)-2-imidazoline	No	MIR.
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	Yes	BRD, HDG, MIR, MOA, (²).
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazoline, fatty acid salt	No	(²).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

<i>Surface-active agents</i>	<i>Separate statistics</i> ¹	<i>Manufacturers' identification codes (according to list in table 38)</i>
Cationic—Continued		
Amine oxides and oxygen-containing amines (except those having amide linkages)—Continued		
Cyclic—Continued		
Lignin amine	No	WVA.
Rosin amine, ethoxylated	No	HPC, (²).
m-Toluidine, ethoxylated	No	MIL.
All other cyclic amine oxides and oxygen-containing amines (except those having amine linkages)	No	(²).
Amines and amine oxides having amide linkages:		
Carboxylic acid - diamine and polyamine condensates:		
Acetic acid, amides with polyalkylene polyamines, salt	No	(²).
All other carboxylic acid-diamine and polyamine condensates	No	ARI, ICI, MOA.
Mixed fatty acids-polyalkylenepolyamine condensate	No	TCH.
Naphthenic acids-polyalkylene polyamine condensate	No	(²).
Naphthenic acids-tall oil fatty acids-polyalkylene polyamine condensate	No	(²).
2-Nor-tall oil alkyl-1-tall oil amido-ethyl imidazoline	No	SHX.
Oleic acid-diethylenetriamine condensate	No	ICI.
Oleic acid-N,N-dimethyltrimethylenediamine condensate	No	CCW.
Pelargonic acid-tetraethylenepentamine condensate	No	ETC, HCL, ICI, OC.
Stearic acid-diethylenetriamine condensate	No	ARC, ARI, CRT, OC, PPG, SCP, SQA.
Stearic acid-diethylenetriamine condensate, ethyl sulfate	No	GDC.
Stearic acid-N,N-diethylethylenediamine condensate	No	S.
Stearic acid-ethylenediamine condensate	No	CLD, SOS.
Stearic acid mixed amine condensate	No	HCL.
Stearic acid-tetraethylenepentamine condensate	No	(²).
Tall oil acids/aminoethylpiperazine condensate	No	ENJ.
Tall oil acids-diethylenetriamine condensate	No	WTC, WVA.
Tall oil acids-polyalkylenepolyamine condensate	No	FER, WVA, (²).
Tall oil acids-polyalkylene polyamine condensate, salts, with dodecylbenzenesulfonic acid and/or tall oil fatty acids	No	(²).
Tallow fatty acids-aminoethylethanolamine condensates	No	OC.
Carboxylic acid - diamine and polyamine condensates, alkoxyolated:		
Mixed fatty acids-alkylenediamine condensate, polyethoxylate	No	SHX, WTC.
Palm oil acids-ethylenediamine condensate, monoethoxylated	No	FTX.
Stearic acid-ethylenediamine condensate, monoethoxylated	No	DEX, ENJ, GDC, ICI, SLC.
Stearic acid-ethylenediamine condensate, polyethoxylated	No	APC.
All other carboxylic acid - diamine and polyamine condensates alkoxyolated	No	SCP.
Other amines and amine oxides having amide linkages:		
3-Cocoamid-N,N-dimethyl propylamine oxide	No	PPG.
Cocoamidopropyl dimethyl amine oxide	No	AAC, PAT, SBC.
N,N'-(Di-tall oil acid)amidoethylamine	No	(²).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Amines and amine oxides having amide linkages:		
Other amines and amine oxides having amide linkages		
—Continued		
1-(2-Hydrogenated tallow aramidoethyl)-2-nor (hydrogenated tallow)-2-Imidazoline	No	SHX.
3-Lauramido-N,N-dimethylpropylamine oxide	No	FTX, SQA.
Oleamidopropyldimethyl amine	No	WM.
Stearamidoethyldiethylamine	No	S.
Stearamidoethylethanolamine acetate	No	S.
Stearic acid, diethanolamine condensate, methyl sulfate	No	DUP.
Stearylamidopropyldimethyl amine	No	AAC, WM.
Amines, not containing oxygen (and salts thereof):		
Amine salts:		
N,N-Dimethyl-N-alkylamine phosphate	No	(²).
(Hydrogenated tallow alkyl)amine acetate	No	ARC.
(Mixed alkyl)amine phosphate	No	(²).
Octadecylamine acetate	No	ARC, HCL.
(Tallow alkyl)amine acetate	No	ARC, (²).
N-(Tallow alkyl)trimethylenediamine acetate	No	ARC.
All other amine salts (not containing oxygen)	No	SHX.
Diamines and polyamines:		
Imidazoline derivatives:		
1-(2-Aminoethyl)-2-naphthenyl-2-Imidazoline	No	(²).
1-(2-Aminoethyl)-2-nor (tall oil alkyl)-2-Imidazoline	No	WTC, (²).
N-(Coconut oil alkyl)trimethylenediamine	No	ARC, JTO, SHX.
N-(Dimeracidalkyl)trimethylenediamine	No	ENO.
N-(Docosyl and eicosyl)trimethylenediamine	No	ENO.
2-Heptadecyl-2-Imidazoline	No	CGY, SCO.
N-(Mixed alkyl)polyethylenepolyamine	No	CCW.
N-(9-Octadecenyl)trimethylenediamine	No	ARC, JTO, SHX.
Polyalicyclic polyamines and salts and quats	No	(²).
Polyamine/tall oil imidazoline	No	WTC.
1-Propanamine, 3-(C ₁₂ -C ₁₅ alkoxy derivatives)	No	SHX.
N-(Soybean oil alkyl)trimethylenediamine	No	ENO.
Stearamidoethyl-2-heptadecyl imidazoline	No	ICI.
3-(Tall oil amino)propyl amine	No	SHX.
N-(Tallow alkyl)dipropylenetriamine	No	ENJ, SHX.
N-(Tallow alkyl)trimethylenediamine	No	ARC, ENJ, JTO.
All other diamines and polyamines	No	ARC, JTO, SHX, (²).
Primary monoamines:		
Alkyl dimethyl amine oxide	No	HCL.
Arachidylbehenylalkyl amine	No	ENO.
(Coconut oil alkyl) amine	No	ARC, ENO, SHX, WTC.
Dimeracidalkyl amine	No	ENO, WTC.
Dodecylamine	No	ARC, SHX.
[Erucyl alkyl] amine	No	ENO.
Hexadecylamine	No	ARC, ENO, WTC.
(Hydrogenated tallow alkyl) amine	Yes	ARC, ENJ, ENO, JTO, SHX, WTC.
(Mixed alkyl) amine	No	JTO, SHX, WTC.
9-Octadecenylamine	Yes	ARC, ENO, JTO, SHX, WTC.
Octadecylamine	No	ENO, SHX, WTC.
(Soybean oil alkyl) amine	Yes	ARC, ENO, JTO.
(Tallow alkyl) amine	No	ARC, ENJ, ENO, JTO, SHX, WTC.
All other primary monoamines	No	ARC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Amines, not containing oxygen (and salts thereof)—Cont.		
Secondary and tertiary monoamines:		
Bis (coconut oil alkyl) amine	No	ARC.
Bis (hydrogenated tallow alkyl) amine	No	ARC.
1-Decanamine, N,N-didodecyl	No	SHX.
N,N-Dimethylbenzylarachidyl amine	No	WTC.
N,N-Dimethyl (coconut oil alkyl) amine	No	ARC, PG.
N,N-Dimethyldodecylamine	No	ARC, SHX, TNA, WTC.
N,N-Dimethylhexadecylamine	No	ARC, SHX.
N,N-Dimethyl (hydrogenated tallow alkyl) amine	No	ARC, CPC.
N,N-Dimethyl (mixed alkyl) amine	No	BRD, JTO, SHX.
N,N-Dimethyl (9-octadecenyl-alkyl) amine	No	ENO.
N,N-Dimethyloctadecylamine	No	ARC, ENO, SHX, WTC.
N,N-Dimethyl (soybean oil alkyl) amine	No	ARC, JTO, WTC.
N,N-Dimethyl (tallow alkyl) amine	No	ENO.
N,N-Dimethyltetradecylamine	No	BRD, SHX.
N-Methylbis (coconut oil alkyl) amine	No	ARC, SHX.
N-Methylbis (hydrogenated tallow alkyl) amine	No	ARC, ENO, SHX, WTC.
Methyl didecylamine	No	TNA.
N-Methyldioctadecylamine	No	ARC, SHX.
Trisododecylamine	No	SCP.
Trilaurylamine	No	SCP.
Tri (mixed alkyl) amine	No	SHX.
Trioctylamine	No	SCP, SHX.
Tri (tridecyl) amine	No	SHX.
All other secondary and tertiary monoamines	No	ARC, ENO, SHX.
Oxygen-containing quaternary ammonium salts:		
β -Alanine-N-(2-hydroxyethyl)-N-2,1-[[oxococoyl] amino] ethyl, sodium salt	No	SHX.
2-(C ₁₂ -C ₁₇ -Alkyl)-1-(C ₄ -C ₁₆ -amidoethyl) (4,5-dihydro-3-methyl)imidazolinium, methyl sulfate	No	DOW, SVC.
(2-Aminoethyl)ethyl (hydrogenated tallow alkyl) (2-hydroxyethyl) ammonium ethyl sulfate	No	OC.
Benzyl (polyoxyethylene octadecylamine) ammonium chloride with benzyl (polyoxyethylene tallowamine) ammonium chloride	No	S.
Benzyl (coconut oil alkyl) bis (2-hydroxyethyl)-ammonium chloride	No	ARC, (2).
1-Benzyl-1-(2-hydroxyethyl)-2-nor (tall oil alkyl)-2-imidazoline	No	SHX, (2).
Benzyl (tallow alkyl) bis (2-hydroxyethyl) ammonium chloride	No	DUP.
Bis (N-amidopropyl)-N,N-dimethyl-N-ethylammonium ethyl sulfate, dimer acid	No	SBC.
Bis (N,N'-ethyl (stearic/arachidic/behenic) amide)-cyanoethyl ethylammonium ethosulfate	No	PCI.
Bis (2-hydroxyethyl, ethoxylated)-methyloctadecylammonium chloride	No	SHX.
Bis-2-hydroxyethyl-hydrogenated tallow-ethyl sulfate	No	ICI.
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate	No	HXL.
(Coconut oil alkyl) bis (2-hydroxyethyl, ethoxylated)-methylammonium chloride	Yes	ENJ, GAF, SHX.
(Coconut oil alkyl)-bis-(hydroxyethyl) methyl ethoxylated mono-(2-carboxyethyl) ether methyl sulfate, potassium salt	No	SVC.
Coconut oil fatty acid polyoxyethylene	No	S.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Oxygen-containing quaternary ammonium salts—Continued		
Dimethyl dodecyl ethyl ammonium ether sulfate	No	PCI.
Dlstearyldimethyl ammonium methosulfate	No	HXL.
Ethanaminium, 2-hydroxy-N,N-bis(2-hydroxyethyl)-N-methyl-, salt with silicic acid	No	TCH.
Ethoxylated(hydrogenated tallow amine), methyl ammonium chloride	No	ENJ.
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	No	ENJ.
Ethoxylated tallow amine, potassium propionate derivative	No	SVC.
N-Ethyl-N,N-bis(polyoxyethylene)tallow ammonium ethyl sulfate	No	SHX.
1-Ethyl-2-(8-heptadecenyl)-1-(2-hydroxyethyl)-2-imidazolium ethyl sulfate	No	ICI, SHX.
N-Ethyl-N-hexadecylmorpholinium ethyl sulfate	No	BRD, ICI, S.
Ethyl(polyoxyethylene, cocoamine) ethylsulfate	No	
N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	No	ICI, PCH.
α -Gluconamidopropyl dimethyl-2-hydroxyethyl ammonium chloride	No	VND.
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)-ammonium dihydrogen phosphate	No	ACY.
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)-ammonium nitrate	No	ACY.
Hydroxyethyl-2-undecyl-2,3-imidazoline	No	MOA.
N-2-hydroxy propyl-n-methyl-N,n-blstallow amide ethyl ammonium ethyl sulfate	No	SHX.
Imidazolium, 1-carboxymethyl)-4,5-dihydro-1-(hydroxyethyl)-2-nor(cocoalkyl), hydroxides, monosodium salts	No	SHX.
Imidazolium, 1-(carboxymethyl)-2-heptyl-1-(2-hydroxyethyl), hydroxide, sodium salt	No	SHX.
Isostearamidopropyl dimethylamino glycolate	No	SBC.
(3-Lauramidopropyl)trimethylammonium methyl sulfate	No	ACY.
Methyl, bis-(2-hydroxyethyl) isodecyloxypropylammonium chloride	No	ENJ.
Methyl, bis-(2-hydroxyethyl) isotridecyloxypropylammonium chloride	No	ENJ.
Methyl, bis-(2-hydroxyethyl) soyaalkylammonium chloride	No	ENJ.
Methyl dioleil ethoxy ammonium methyl sulfate	No	SHX.
Methyl-ditallowimidazolium methosulfate	No	SVC.
1-Methyl-2-(8-heptadecenyl)-1-(9-octadecenyl) amido ethyl	No	SHX.
N-Methyl-N-polyoxyethylene-N,N-bis(hydrogenated tallow amidoethyl)ammonium	No	SHX.
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	No	SHX.
Methyltallowdiethylenetriamine condensate, polyethoxylated, methyl sulfate	No	SVC.
Methyltallowdiethylenetriamine condensate, polypropoxylated, methyl sulfate	No	SVC.
Mixed alkyl imidazoline derivative, ethoxylated	No	MOA.
Mixed(coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	No	ENJ.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Oxygen-containing quaternary ammonium salts—Continued		
Mixed fatty acid amide with diethylene triamine/ethyl sulfate	No	EFH.
N-Octadecyl-N,N-di(2-hydroxyethyl)-N-methylammonium chloride	No	SHX.
Polyethylenimine methyl ammonium sulfate	No	HCL.
Polypropoxy diethylmethyl ammonium chloride	No	WTC.
1-Propanaminium, N-ethyl-N,N-dimethyl-3-(1-oxooctadecyl)amino-, ethyl sulfate	No	SBC.
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	No	ENJ.
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, propoxylated, quaternized	No	ENJ.
Stearamidopropyl dimethylcetylammonium tosylate and propylene glycol	No	VND.
Stearylamidopropyl dimethyl myristyl acetate ammonium chloride	No	VND.
(Tallow alkyl)amine, ethoxylated, diethosulfate	No	ETC.
(Tallow alkyl)-bis-(2-hydroxyethyl)methylammonium chloride	No	JTO.
Tallow amine, ethoxylated, quaternary ammonium salt ..	No	DUP, VND.
Tetra Butyl ammonium hydrogen sulfate	No	HXL.
All other oxygen-containing quaternary ammonium salts (except those having amide linkages)	No	ARC, PPG, SBC, SCP, SHX, (²).
All other oxygen-containing quaternary ammonium salts	No	BRD, GAF, PPG.
Quaternary ammonium salts, not containing oxygen:		
Acyclic:		
Bis(coconut oil alkyl)dimethylammonium chloride	Yes	ARC, ENJ, JTO, SHX.
Bis(hydrogenated tallow alkyl)dimethylammonium chloride	Yes	ARC, ENO, SHX, WTC.
Bis(hydrogenated tallow alkyl)-dimethylammoniummethyl sulfate	No	ARC, SHX.
Bis(tallow alkyl)dimethylammonium chloride	No	SHX.
N-(Cocoamidopropyl)-N,N-acetic acid ammonium salt	No	(²).
Cocodimethyl ethyl ammonium ethyl sulfate	No	SHX.
N-[(Coconut oil alkyl)amino]butyric acid, sodium salt ..	Yes	ARC, BRD, HNT, JTO, PPG, SHX.
Dicocodimethyl ammonium methyl sulfate	No	HXL.
Didecyl dimethylammonium chloride	No	ARC.
Dimethyl di(C ₁₂ -C ₁₈)ammonium chloride (mixed straight and branched chains)	No	SHX.
Dimethyldioctadecylammonium chloride	No	ARC, SHX.
Dimethyl(soya alkyl)ammonium ethyl sulfate	No	SVC.
N,N-Dioctyl-N,N-dimethyl ammonium chloride	No	BRD, HNT.
Ditallowamidoammonium sulfate	No	CRD.
Dodecyltrimethylammonium chloride	No	ARC, SHX.
Ethyl dimethyl(mixed alkyl)ammonium ethyl sulfate	No	DEX, PPG.
Ethylhexadecyl dimethylammonium bromide	No	HXL.
Hexadecyltrimethylammonium bromide	Yes	AAC, ARC, HXL.
Hexadecyltrimethylammonium chloride	No	AAC, ARC, BRD, SHX.
Hexane-1,6-bis(tributyl ammonium bromide)	No	HXL.
(Hydrogenated tallow alkyl)trimethylammonium chloride	No	SHX.
Hydroxypropyl ammonium cyano acetate	No	(²).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Quaternary ammonium salts, not containing oxygen—Continued		
Acyclic—Continued		
Lauryl pyridinium chloride	No	WTC.
Methyl (tri-hydrogenated tallow alkyl)ammonium chloride	No	WTC.
Methyl-1-tallowamidoethyl-2-tallowimidazolium-methyl sulfate	No	CRD.
Methyl tri(C ₉ -C ₁₀) ammonium chloride	No	SHX.
Methyltrioctylammonium chloride	No	SCP.
(Mixed alkyl) ammonium chloride	No	MIL.
(Mixed linear alkyl)dimethyl ammonium methyl sulfate	No	HCL.
Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl)ammonium chloride	No	BRD.
Octyl decyl dimethyl ammonium chloride	No	HNT.
N-Octyl, N-decyl, N,N-dimethyl ammonium chloride ...	No	BRD.
N,N,N',N'-Pentamethyl-N-(tallow alkyl)-trimethylene-bisammonium chloride	No	ARC, SHX.
Stearic acid ethylene diamine methyl ammonium sulfate	No	HCL.
Stearyl pyridium chloride	No	WTC.
Tetrabutylammonium bromide	No	HXL, RSA.
1-Tetradecanaminium, N,N,N-trimethyl-chloride	No	SHX.
Tetraethylammonium bromide	No	EK.
Tetraethyl ammonium chloride	No	RSA.
Tetraheptyl ammonium bromide	No	EK.
Tetra methyl ammonium bromide	No	RSA.
Tetramethylammonium chloride	No	RSA.
Tributylmethylammonium chloride	No	TNA.
Trihydrogenated tallow ammonium chloride	No	ENO.
Trimethyl(mixed alkyl) ammonium chloride	No	WTC.
Trimethyloctadecylammonium chloride	No	ARC, SHX, SVC.
Trimethyl(soybean oil alkyl)ammonium chloride	No	ARC, JTO, SHX.
Trimethyl(tallow alkyl)ammonium chloride	Yes	ARC, ENO, JTO, SHX, WTC.
Trimethyltetradecylammonium bromide	No	AAC, HXL.
All other acyclic quaternary ammonium salts, not containing oxygen	No	AAC, ARC, MOA, PCI, PPG, RSA, SHX, (2), (2).
Cyclic:		
Benzyl (alkylpyridinium) chloride	No	(2).
Benzyl (cocoamidopropyl)dimethyl ammonium chloride ..	No	(2).
Benzyl (coconut oil alkyl)dimethylammonium chloride ..	No	ENO, GDC, HRT, LUR, TCC, WTC, (2).
Benzyl-di(hydrogenated tallow alkyl)-methylammonium chloride	No	ENO.
Benzylidimethyl(mixed alkyl)ammonium chloride	Yes	BKM, BRD, CRD, HIL, HNT, PCI, PPG, SHX, (2), (2).
Benzylidimethyloctadecylammonium chloride	Yes	AAC, PPG, SHX, TNI.
Benzylidimethyl(tallow alkyl)ammonium chloride	No	BOE, ENO, WTC.
Benzylhexadecyl dimethylammonium chloride	No	BKM.
Benzyl(hydrogenated tallow alkyl)dimethylammonium chloride	No	ARC, ENO, SHX, WTC.
Benzyl-methyl-bis(hydrogenated tallow)ammonium chloride	No	ENO.
Benzyl(mixed alkyl)pyridinium chloride	No	(2).
Benzyl picolinium chloride	No	GDC.
1-Benzylpyridinium chloride	No	BRD, HIP.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Quaternary ammonium salts, not containing oxygen—Cont.		
Cyclic—Continued		
1-Benzylquinolinium chloride	No	(²).
Benzyltrimethylammonium chloride	Yes	CRT, PCI, RSA, SHX, TCC, UTC.
Butylpicolinium bromide	No	HXL.
2,4-Dichlorobenzyl dimethyl (mixed alkyl) ammonium chloride	No	(²).
1-Dodecylpyridinium chloride	No	DAN.
(Ethylbenzyl) dimethyl (mixed alkyl) ammonium chloride	No	HNT.
(Mixed alkyl) dibenzyltrimethyl-1,3-propane diammonium chloride	No	GDC.
1-Phenethyl-2-picolinium bromide	No	HXL.
All other cyclic quaternary ammonium salts not containing oxygen	No	ICI, JTO, (²), (²).
All other cationic surface-active agents	No	AAC, BRD, BRI, CGY, DUP, JTO, MIR, MOA, PPG, RPC, TCH, WM, WTC.
Nonionic		
Carboxylic acid amides:		
Diethanolamine condensates (Amine/acid ratio = 2/1):		
Capric acid (Ratio = 2/1)	No	SCP.
Castor oil acids (Ratio = 2/1)	No	AAC, MCP, NSC, TCH.
Coconut oil acids (Ratio = 2/1)	Yes	AAC, ARD, BRI, CCC, CCL, CON, CTL, ECC, EFH, FTX, GAF, GDC, HNT, HRT, MOA, PNK, PPG, REZ, SBC, SCP, SHX, STP, WTC.
Coconut oil and tallow acids (Ratio = 2/1)	Yes	BRD, ENJ, ESS, MOA, SBC, UNN.
Lard oil acids	No	FER.
Lauric acid (Ratio = 2/1)	No	CRD, MOA.
Lauric and myristic acids (Ratio = 2/1)	Yes	CRD, FTX, MOA, PPG, SBC, STP.
Linoleic acid (Ratio = 2/1)	No	MOA.
Mixed carboxylic acids	No	FER, RPC, SOS.
Mixed fatty acids, neutralized	No	CPC, FTX.
Oleic acid (Ratio = 2/1)	Yes	AAC, CTL, EFH, GAF, MOA, PPG, SBC, STP.
Palmitic and stearic acids (Ratio = 2/1)	No	RPC.
Pelargonic acid (Ratio = 2/1)	No	TCH.
Stearic acid (Ratio = 2/1)	Yes	AAC, EFH, OC.
Tall oil acids (Ratio = 2/1)	Yes	BRI, ECC, HCL, MOA, PNK, PPG, SBC, WVA.
Tallow acids (Ratio = 2/1)	No	EFH, ICI, MOA.
All other diethanolamine condensates (Amine/acid = 2/1)	No	MOA, SHX.
Diethanolamine condensates, other amine/acid ratios:		
Capric acid (Ratio = 1/1)	No	MOA.
Coconut oil acids (Ratio = 1/1)	Yes	AAC, ARD, BRD, CTL, EMK, ETC, FTX, GAF, HNT, HRT, HTN, JRG, MIR, MOA, PIL, PPG, SBC, SCP, SHX, STP, TCC, VND, WTC, (²).
Lauric acid (Ratio = 1/1)	Yes	AAC, HTN, MOA, SBC, TNI, WTC.
Lauric and myristic acid (Ratio = 1/1)	Yes	AAC, BRD, FTX, MOA, SBC.
Linoleic acid (Ratio = 1/1)	Yes	ARD, MOA, SBC, VND.
Mixed carboxylic acids (Ratio = 1/1)	No	SOS, WTC.
Mixed fatty acids (Ratio = 1.1)	No	WTC.
Myristic acid (Ratio = 1/1)	No	MOA.
Oleic acid (Ratio = 1/1)	No	AAC, SBC.
Palm kernel oil acids (Ratio = 1/1)	No	TMH.
Rapeseed acids (Ratio = 1/1)	No	EFH.
Soybean oil acids (Ratio = 1/1)	No	MOA, PPG, SBC.
Stearic acid (Ratio = 1/1)	Yes	AAC, BRD, ECC, ENJ, HIP, MRV.
Tall oil acids (Ratio = 1/1)	No	CHP, WTC, (²).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Carboxylic acid amides—Continued		
Diethanolamine condensates other amine/acid—Continued		
Tallow acids (Ratio = 1/1)	No	MOA.
All other diethanolamine condensates, amine/acid ratio=1/1	No	MOA, QCP.
All other carboxylic acid amides:		
Coconut oil acids	No	STP.
Coconut oil acids-alkanolamine condensate (Ratio = 1/1)	No	AAC, FTX, MOA, PG, PPG, SOS.
Coconut oil acids-alkanolamine condensate (Ratio = 2/1)	No	ENJ, MOA, STP.
Coconut oil acids-alkanolamine condensate (Ratio = 1/2)	Yes	HTN, MOA, PAT, QCP.
Coconut oil acids-dimethylaminopropylamine condensate (Ratio = 1/1)	No	(²).
Coconut oil acids-ethanolamine condensate, ethoxylated	Yes	BRD, GAF, PPG, STP, SVC.
Dioleic acid (Ratio = 1/2)	No	CLD.
Hydrogenated tallow acids, aminoethylethanolamine, acetate salt	No	PCI.
Hydrogenated tallow amides, ethoxylated	No	GAF.
Hydrogenated tallow glycerides diethylenediamine condensate	No	HRT.
Isonanolic acid, mono- and triethanolamine salt	No	HCL.
Isopropanolamine condensates	No	SBC.
Isostearic acid, aminoethylethanolamine, acetate salt	No	PCI.
Lauric acid	No	AAC, HTN, MOA.
Lauric acid (Ratio = 1/1)	No	AAC.
Lauric and myristic acids (Ratio = 1/1)	No	MOA.
Mixed fatty acids, diethanolamine condensate	No	WTC.
Oleic acid-ethanolamine condensate, ethoxylated	No	SHX.
Ricinoleic acid	No	AAC.
Stearic acid (Ratio = 1/1)	No	AAC, MOA, VND.
Stearic acid (Ratio = 2/1)	No	ECC.
Stearic acid aminoethanolamine (amine acid ratio = 1.0/1.65)	No	CHP.
Stearic acid-aminoethyl ethanolamine (amine/acid ratio = 1.75/1.0)	No	SBC.
Stearic acid aminoethylethanolamine (amine acid ratio = 1/2)	No	VKR.
Stearic acid-N-aminoethyl ethanolamine condensate	No	BOE.
Stearic acid-ethylenediamine condensate (Ratio = 1/2)	No	AAC, TCH.
Stearic acid monoethanolamine condensate	No	WTC.
Tail oil acids-dimethylamine condensate (Ratio = 1/1)	No	BKM.
Tail oil fatty acids (Ratio = 1/2)	No	EFH.
Tail oil fatty acids (Ratio = 2.7/1)	No	EFH.
Tail oil fatty acids (Ratio = 1.5/1)	No	EFH.
Tail oil fatty acids-triethanolamine condensate	No	(²).
Tallow acids (Ratio = 1.00/1.65)	No	PAT.
Tallow, N-[3-(dimethylamino)propyl] (Ratio = 1/3)	No	PAT.
All other diethanolamine condensate	No	AAC, EFH, QCP.
All other ethanolamine condensates, amine/acid ratio = 2/1	No	SHX.
All other carboxylic acid amides	No	ARC, CGY, GAF, JTO, ROB, SCP, (²).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Carboxylic acid esters:		
Anhydrosorbitol esters:		
Anhydrosorbitol dioleate	No	ICI.
Anhydrosorbitol monoester of tall oil acids	No	HDG.
Anhydrosorbitol monolaurate	Yes	BRD, EMR, ICI, PPG, TCH.
Anhydrosorbitol monooleate	No	BRD, EMR, HDG, ICI, PPG, TCH.
Anhydrosorbitol monopalmitate	No	ICI, PPG.
Anhydrosorbitol monostearate	Yes	BRD, HDG, ICI, PPG, TCH.
Anhydrosorbitol sesquioleate	Yes	BRD, HDG, PPG, TCH.
Anhydrosorbitol sesquisteareate	No	TCH.
Anhydrosorbitol triester of tall oil acids	No	(?).
Anhydrosorbitol trioleate	Yes	BRD, ICI, PPG, TCH.
Anhydrosorbitol tristearate	No	BRD, PPG.
All other anhydrosorbitol esters	Yes	BRD.
Diethylene glycol esters:		
Diethylene glycol distearate	No	BRD.
Diethylene glycol monoester of coconut oil acids	No	CLD.
Diethylene glycol monoester of tall oil acids	No	BKM.
Diethylene glycol monoester of tallow acids	No	ENJ.
Diethylene glycol monolaurate	Yes	CTL, ECC, HDG, PPG.
Diethylene glycol monostearate	Yes	AAC, ECC, HDG, STP.
Diethylene glycol sesquieater of tall oil acids	No	ECC.
Diethylene glycol sesquilaurate	No	BRD.
Diethylene glycol terephthalate	No	UPF.
Ethoxylated anhydrosorbitol esters:		
Ethoxylated anhydrosorbitol monolaurate	Yes	BRD, ETC, HDG, ICI, PPG, SVC, TCH.
Ethoxylated anhydrosorbitol mono-oleate	Yes	BRD, ETC, HDG, ICI, SVC, TCH.
Ethoxylated anhydrosorbitol monopalmitate	No	ICI, PPG.
Ethoxylated anhydrosorbitol monostearate	Yes	BRD, ETC, ICI, PPG, TCH.
Ethoxylated anhydrosorbitol monotallate	No	HDG.
Ethoxylated anhydrosorbitol triester of tall oil acids	No	WTC.
Ethoxylated anhydrosorbitol trioleate	Yes	BRD, ETC, HDG, ICI, PPG, TCH.
Ethoxylated anhydrosorbitol tristearate	Yes	BRD, ICI, PPG.
All other ethoxylated anhydrosorbitol esters	No	BRD.
Ethoxylated sorbitol esters:		
Ethoxylated sorbitol beeswax ester	No	ICI.
Ethoxylated sorbitol hexaester of tall oil acids	No	TCH.
Ethoxylated sorbitol hexaoleate	No	ICI, PPG, TCH.
Ethoxylated sorbitol lanolin ester	No	ICI.
Ethoxylated sorbitol monooleate	No	CPC, ICI.
Ethoxylated sorbitol monostearate	No	TCH.
Ethoxylated sorbitol oleate, acetylated	No	ICI.
Ethoxylated sorbitol pentalaurate	No	PPG.
Ethoxylated sorbitol tetraester of lauric and oleic acids	No	ICI.
Ethoxylated sorbitol tetraester of tall oil acids	No	AAC, (?).
Ethoxylated sorbitol tetraoleate	No	ICI.
Ethoxylated sorbitol tetrastearate	No	ICI.
Ethylene glycol esters:		
Ethylene glycol distearate	Yes	AAC, EMR, ENJ, HDG, PPG, STP, TCH, WM.
Ethylene glycol monooleate	No	EFH.
Ethylene glycol monostearate	Yes	AAC, BRD, EMR, HDG, PPG, STP, VND, WM, WTC.
Ethylene glycol sesquisteareate	No	JTO, STP.
All other ethylene glycol esters	No	EMR.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Glycerol esters—Continued		
Complex glycerol esters:		
Glycerol diacetylitartrate monooleate	No	HTN.
Glycerol diacetylitartrate monostearate	No	EKT.
Glycerol mono and diesters of mixed fatty acids	No	ICI.
Glycerol monoester of mixed fatty acids, acetylated	No	EKT.
Glycerol monoester of mixed fatty acids succinylated	No	EKT.
Glycerol monooleate, ethoxylated	No	SCP.
All other complex glycerol esters	No	BRD, LEV.
Glycerol esters of chemically defined acids:		
Glycerol dilaurate	No	VND.
Glycerol monolaurate	No	BRD.
Glycerol monooleate	Yes	AAC, BDR, EFH, EMR, HAL, HDG, PPG, STP.
Glycerol monoricinoleate	No	BRD, HDG, PPG.
Glycerol monostearate	Yes	BRD, CCC, CHL, CLD, CRT, EMR, HAL, HDG, HRT, PPG, SOS, SQA, STP, VND, WM, WTC, (²).
Glycerol trioctanoate/decanoate	No.	WM.
All other glycerol esters of chemically defined acids	No	EMR.
Glycerol esters of mixed acids:		
Glycerol diester of coconut oil acids	No	WM.
Glycerol mono-, di-, and triesters of hydrogenated tallow acids	No	WPG.
Glycerol monoester of C ₈ -C ₁₀ acids	No	SVC.
Glycerol monoester of coconut oil acids	No	BRD, TCH.
Glycerol monoester of cottonseed oil acids	No	EKT.
Glycerol monoester of hydrogenated cottonseed oil acids	No	EKT, WM.
Glycerol monoester of hydrogenated lard acids	No	EKT.
Glycerol monoester of hydrogenated soybean oil acids	No	BFP, EKT.
Glycerol monoester of lard acids	No	EKT.
Glycerol monoester of palm oil acids	No	EKT.
Glycerol monoester of safflower oil acids	No	EKT.
Glycerol monoester of tall oil acids	No	FER.
Glycerol monoester of tallow acids	No	CPC, EKT.
Glycerol sesquilester of hydrogenated tallow acids	No	PCI.
Glycerol triester of mixed fatty acids	No	SVC.
Mixed ester of resin and rosin acids	No	WVA.
All other glycerol esters of mixed acids	No	BFP, PPG.
Natural fats and oils, ethoxylated:		
Carnauba wax, ethoxylated	No	SHX.
Castor oil, ethoxylated	Yes	CAS, ETC, GAF, HTN, ICI, MIL, PPG, S, SVC, TCH, TMH, (²).
Coconut oil, ethoxylated	No	ETC, HCL.
Hydrogenated castor oil, ethoxylated	Yes	ETC, GAF, HCL, ICI, MIL, PPG, SCP, TCH.
Lanolin, ethoxylated	Yes	AAC, CRD, HCL, HDG, TCH, (²).
Mixed fatty acids, alkyl ether, ethoxylated	No	(²).
Mixed tall oil and rosin acids, ethoxylated	No	HCL.
Oleic acid, ethoxylated and propoxylated	No	MIL.
Tall oil acids, ethoxylated	No	GAF, HCL.
Tall oil acids, ethoxylated and propoxylated	No	(²).
Tall oil, refined, ethoxylated	No	TCH, (²).
Tallow fatty acids, ethoxylated	No	GAF.
All other natural fats and oils, ethoxylated	No	MIL, SCP.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 38)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Polyethylene glycol esters:		
Polyethylene glycol esters of chemically-defined acids:		
Polyethylene glycol dilaurate	Yes	BRD, EFH, ETC, HDG, PPG, STP, TCH, WM.
Polyethylene glycol dioleate	Yes	BRD, CLD, EFH, ETC, HAL, MIL, OC, PPG, QCP, SOS, STP.
Polyethylene glycol distearate	Yes	AAC, BRD, PPG, SBC, STP, WTC. CCA.
Polyethylene glycol hydroxyacetate	No	ECC.
Polyethylene glycol monocaprylate	No	PPG.
Polyethylene glycol monoisostearate	No	BRD, CCA, CGY, ECC, EFH, ETC, HAL, ICI, PPG, STP, SVC, TCH.
Polyethylene glycol monolaurate	Yes	APC, BOE, BRD, CCA, CCC, CLD, CRT, ECC, EFH, ETC, GAF, GDC, HAL, HDG, LUR, MRT, MRV, OC, PPG, SHX, STP, SVC, TCH, WTC.
Polyethylene glycol monooleate	Yes	ICI.
Polyethylene glycol monooleate, ethoxylated	No	BRD, ETC, HCL, ICI, SHX.
Polyethylene glycol monopalmitate	Yes	TCH.
Polyethylene glycol monopelargonate, methoxylated	No	ETC, HCL, SOS, TCH.
Polyethylene glycol monopelargonate	Yes	ECC.
Polyethylene glycol monoricinoleate	No	APC, BRD, CCC, CPC, CRT, DEX, EFH, ETC, GDC, HDG, HRT, ICI, LUR, OC, PPG, SLC, SOS, STP, SVC, TCH, VND.
Polyethylene glycol monostearate	Yes	LUR, PPG.
Polyethylene glycol monotallate	No	ETC, SOS, TCH.
Polyethylene glycol sesquinoate	No	BOE, PCI.
Polyethylene glycol terephthalate	No	BAS, ETC, HCL.
Polyethylene glycol esters of chemically defined acids, all other	No	
Polyethylene glycol esters of mixed acids:		
Polyethylene glycol diester of coconut oil acids	No	PCI.
Polyethylene glycol diester of coconut oil and oleic acids	No	EFH.
Polyethylene glycol diester of mixed linear acid/oleic acid	No	PCI.
Polyethylene glycol diester of tall oil acids	Yes	CCC, EFH, ETC, GAF, PAT, PPG, QCP, (2).
Polyethylene glycol ester of mixed fatty acids	No	SHX, SOS.
Polyethylene glycol monoester of coconut oil acids	No	ICI, LUR.
Polyethylene glycol monoester of soybean oil acids	No	BRD, LUR.
Polyethylene glycol monoester of tall oil acids	Yes	BKM, EFH, FER.
Polyethylene glycol sesquilester of coconut oil acids	No	ENJ, MRT, PAT, PPG, SCP, TCH.
Polyethylene glycol sesquilester of tall oil acids	Yes	ICI, PPG, SLM, WTC, (2).
Polyethylene glycol sesquilester of tallow acids	No	PAT, RPC, SHX, TCH.
All other polyethylene glycol esters of mixed acids	No	ETC, QCP, SCP, WTC.
Polyglycerol esters:		
Hexaglycerol	No	SVC.
Mixed oleic, lauric, stearic, and palmitic hexaglycerol esters	No	SVC.
Polyglycerol decaoleate	No	TCH.
Polyglycerol distearate	No	BRD.
Polyglycerol monooleate	Yes	HDG, PPG, WTC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Nonionic		
Carboxylic acid esters—Continued		
Polyglycerol esters—Continued		
Polyglycerol monostearate	No	BRD, PPG, SVC.
Polyglycerol tetraoleate	No	PPG.
Triglycerol monooleate	No	SVC.
All other polyglycerol esters	No	BRD.
Propanediol esters:		
1,2-Propanediol dioctanoate/decanoate	No	SVC, WM.
1,2-Propanediol dipelargonate	No	WM.
1,2-Propanediol distearate	No	HCL.
1,2-Propanediol di-2-ethyl hexanoate	No	WM.
1,2-Propanediol monooleate	No	SBC.
1,2-Propanediol monooleate	No	EFH.
1,2-Propanediol monostearate	Yes	BRD, EKT, HAL, PPG, SBC, WM.
Other carboxylic acid esters:		
Caprylic amphopropionate	No	MOA.
DI-isobutylene maleate	No	RH.
Ethoxylated 1,3-butylene glycol stearate	No	HCL.
Ethoxylated castor oil, ditridecylmaleate	No	UPF.
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	No	SVC.
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	No	SVC.
Ethoxylated nonylphenol laurate	No	TCC.
Ethoxylated 1,2-propanediol monostearate	No	ICI.
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	No	SVC.
Linoleic acid dimers, alkoxyated	No	(²).
Maleic anhydride, polypropylene glycol copolymer	No	PCI.
Methylglucoside laurate	No	HDG.
Mixed alkyl benzoate	No	APC.
Mixed alkyl stearate	No	SOS.
Mixed di- and triethylene glycol mono ester of tall oil acid	No	WVA.
Nonylphenol ethoxylate, oleate	No	EFH.
Pentaerythritol distearate	No	AAC, PPG.
Pentaerythritol stearate	No	SCP.
Pentaerythritol tetraoleate	No	PPG.
Polyalkylene glycol oleate	No	SOS.
Polycarboxylic acid, alkylate	No	(²).
Polycarboxylic acid, alkylphenoxyalkoxylate	No	(²).
Polypropylene glycol dioleate	No	CLD.
Polypropylene glycol, ethoxylated, adipic acid ester	No	(²).
Propylene glycol esters of hydrogenated palm oil	No	PG, VND.
Propylene glycol monohydroxy stearate	No	CAS.
Sucrose, ethoxylated and propoxylated	No	PPG.
All other carboxylic acid esters	No	ARI, CHP, GAF, HDG, ROB, SYL, (²).
Ethers:		
Benzenoid ethers:		
All other alkylphenol-formaldehyde condensates, alkoxyated	No	ETC, (²).
Amylphenol-formaldehyde, alkoxyated	No	(²).
Bisphenol A, ethoxylated and propoxylated	No	PPG.
Bisphenol A, ethoxylated	No	PPG.
2-Butanol, ethoxylated and propoxylated	No	PPG.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Ethers—Continued		
Benzenoid ethers—Continued		
p-tert-Butylphenol-formaldehyde, alkoxyated	No	(²).
Dinonylphenol, ethoxylated	Yes	CPC, ETC, GAF, PPG, RH, S, TCH, (²).
Dodecylphenol, ethoxylated	Yes	ETC, GAF, MON, SCP, TMH.
Epichlorohydrin bisphenol A, ethoxylated	No	(²).
Furfuryl alcohol, ethoxylated	No	SVC.
Iso-octylphenol, ethoxylated	Yes	AAC, BAS, GAF, PPG, RH, TMH.
Isooctylphenol, ethoxylated, benzyl ether	No	PPG.
(Mixed alkyl)phenol, alkoxyated	No	(²).
(Mixed alkyl)phenol epichlorohydrin-formaldehyde, alkoxyated	No	(²).
(Mixed alkyl)phenol, ethoxylated	No	BAS, CPC, ENJ, MIL.
(Mixed alkyl)phenol, ethoxylated, butyl ether	No	RH, TCH.
(Mixed alkyl)phenol-formaldehyde, alkoxyated	Yes	ENJ, GAF, WTC, (²), (²).
(Mixed alkyl)phenol formaldehyde, methoxylated	No	HCL.
Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenylsulfone	No	PCI.
Naphthalenesulfonic acid, polymer with formaldehyde, sodium salt	No	PCI.
Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenylsulfone, ammonium salt	No	PCI.
Nonylphenol, ethoxylated	Yes	AAC, BAS, CPC, DUP, ENJ, ETC, GAF, HCL, HDG, HTN, ICI, MIL, MOA, MON, OMC, PPG, RH, S, SCP, SHX, STP, TCH, TMH, TX, UCC, WTC, (²), (²), (²).
Nonylphenol, ethoxylated, phosphate esters	No	OMC.
Nonylphenol, ethoxylated and propoxylated	Yes	GAF, HCL, RH, SCP, TMH, (²).
Nonylphenol, ethoxylated, with fumaric acid	No	PPG.
Nonylphenol, ethoxylated with mixed fatty acids	No	SOS.
Nonylphenol-formaldehyde, alkoxyated	No	WTC, (²), (²).
Nonylphenol oleate, ethoxylated	No	SOS.
n-Octylphenol, ethoxylated	Yes	AAC, DUP, GAF, SCP, TCH, WTC.
tert-Octylphenol-formaldehyde, ethoxylated	No	SDW.
Phenol, ethoxylated	No	GAF, HCL, ICI, MIL, PPG, SCP, TCH.
Phenol-formaldehyde resin (with lignite)	No	PSP.
Phenylstyrene, ethoxylated	No	HCL.
Soya sterols, ethoxylated	No	SCP.
Tridecylphenol, ethoxylated	No	CPC.
All other benzenoid ethers	No	BAS, HCL, RH, SHX.
Nonbenzenoid ethers:		
Chemically-defined linear alcohols, alkoxyated		
Butanol, ethoxylated	No	GAF, PPG.
Butyl alcohol, propoxylated	No	WTC.
Decyl alcohol, ethoxylated	Yes	BAS, CPC, ENJ, GAF, HCL, ICI, MIL, S, TCH.
Decyl alcohol, ethoxylated and propoxylated	No	GAF.
Decyloxy poly(ethyleneoxy) ethyl chloride	No	GAF.
Dodecyl alcohol, ethoxylated	Yes	AAC, CPC, ICI, MIL, PPG, (²).
Glycerol, ethoxylated	No	SVC.
Hexadecyl alcohol, ethoxylated	No	ICI, TCH.
Hexadecyl alcohol, propoxylated	No	PPG.
Isodecyl alcohol, alkoxyated	No	S, (²).
Isostearyl alcohol, ethoxylated	No	SHX.
Methanol, ethoxylated and propoxylated	No	PPG.
Methyl alcohol, alkoxyated	No	(²).
9-Octadecenyl alcohol, ethoxylated	Yes	AAC, ETC, GAF, ICI, MIR, S, TCH.
Octadecyl alcohol, ethoxylated	No	CPC, GAF, HCL, HTN, ICI, PPG, SCP.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Ethers—Continued		
Nonbenzenoid ethers—Continued		
Chemically-defined linear alcohols, alkoxyated—		
Continued		
Oleyl alcohol, ethoxylated	Yes	CRD, HCL, PPG, SHX.
Stearyl alcohol, propoxylated	No	SVC.
All other chemically-defined linear alcohols, alkoxyated	No	BAS, GAF, HDG, SCP.
Mixed linear alcohols, alkoxyated:		
Coconut oil alcohol, ethoxylated	No	ETC, HCL, TX.
Decyl and octyl alcohols, ethoxylated	No	GAF, SHX.
Mixed linear alcohols, alkoxyated	No	WTC, (2).
Mixed linear alcohols, ethoxylated	Yes	AAC, BAS, DUP, GAF, HCL, HDG, ICI, MIL, PG, PPG, RH, S, SCP, SHC, SHX, STP, TCH, TMH, TNA, TX, UCC, VST, WTC.
Mixed linear alcohols, ethoxylated, benzyl ether	No	(2).
Mixed linear alcohols, ethoxylated and propoxylated	Yes	BAS, DUP, ETC, GAF, MIL, OMC, PPG, S, STP, SVC, TCH, UCC, (2).
Myristyl alcohol, propoxylated	No	WTC.
Stearyl alcohol, propoxylated	No	WTC.
Tallow alcohol, ethoxylated	No	ENJ, ETC, GAF, HCL, SHX, TX.
Wool wax alcohols, ethoxylated	No	CRD.
All other mixed linear alcohols, alkoxyated	No	BRD, RH, SHC, (2).
Other ethers and thioethers:		
Bis-cumylphenyl-oxoethylene titanate	No	KPI.
1,3-Butylene glycol, ethoxylated	No	HCL.
tert-Dodecyl mercaptan, ethoxylated	No	AAC, ETC, GAF.
Glycerine, alkoxyated	No	(2).
Glycerine, ethoxylated	No	PPG.
Glycerine, ethoxylated and propoxylated	No	PPG.
Glycerol, alkoxyated, toluene diisocyanate copolymer	No	(2).
Isodecyl alcohol, ethoxylated	No	ETC.
Isodecyl alcohol, ethoxylated and propoxylated	No	ETC.
Iso-octyl alcohol, ethoxylated	No	ETC.
Lignin, ethoxylated	No	WVA.
Mixed alcohols, ethoxylated	Yes	ENJ, MIL, RH, WM, (2).
Poly(epichlorhydrin)	No	(2).
Polyether diols	No	WTC.
Polyether triols	No	WTC.
Polyethoxylate/polypropoxylate dibenzyl ether	No	(2).
Polyethylene glycol mono(nonylphenol) ether ammonium sulfate	No	(2).
Poly(mixed ethylene, propylene) glycol	Yes	AAC, ETC, GAF, S, UCC, WTC, (2), (2).
Poly(oxy-1,2-ethanediyl), α -phenylmethyl- ω -hydroxy, C ₁₂ -C ₁₈ alkyl ethers	No	PCI.
Poly(oxy-1,2-ethanediyl), α -phenylmethyl- ω -hydroxy, ethoxylated nonylphenol alkyl ether	No	PCI.
Polypropylene glycol, alkoxyated, polymer with maleic anhydride, acrylic acid, and alkylphenol-formaldehyde resin, alkoxyated	No	(2).
Polypropylene glycol, ethoxylated	No	BAS, ETC, GAF, HCL, HDG, SCP, TCH, WTC, (2).
Polypropylene glycol glycerol triether, copolymer with epichlorhydrin bisphenol epoxy resin	No	(2).
Tall oil fatty acid-imidazoline, ethoxylated	No	(2).
2,4,7,9-Tetramethyl-5-decyne-4,7-diol, ethoxylated	No	SCP.
Tridecyl alcohol, ethoxylated	Yes	CPC, DUP, ETC, GAF, HCL, ICI, MIL, OMC, S, TCH, WTC, (2).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Ethers—Continued		
Other ethers and thioethers—Continued		
Tridecyl alcohol, propoxylated and ethoxylated	No	ETC, HTN, TX.
Trimethylnonyl alcohol, ethoxylated	No	UCC.
Trimethylolpropane, alkoxylated	No	BAS, GAF, WTC, (2).
Trimethylpentanediol, ethoxylated	No	SHX.
All other ethers and thioethers	No	GAF, HCL, OMC, RH, SCP, SHX.
Other nonionic surface-active agents:		
Curryl phenolate isopropoxy titanium salt	No	KPI.
Formaldehyde, dicyandiamide, ethylene sulfate polymers	No	PCI.
(Mixed alkyl)phenol alkylenediaminealkanolamine formaldehyde	No	(2).
Mixed fatty acid-ethoxylated nonyl phenol ester	No	RPC.
Tetra-(2,2-dialyloxymethylene)-1-butoxy titanium bis-(dodecyl) phosphite	No	KPI.
Tetra-isopropoxy titanium (bis-dioctyl) phosphite	No	KPI.
Tetra-octyloxy titanium (bis-tridecyl) phosphite	No	KPI.
Tri(castor oil alkyl)phosphate	No	BRD.
All other nonionic surface-active agents	No	CGY, CLU, DUP, LUR, MIL, MOA, PG, PPG, SCP, TCH, WM, (2), (2).

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 38

Surface-active agents: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
AAC	Alcolac, Inc.	GDC	Gresco, Inc.
ACT	Climax Performance Materials Corp.	GRL	Calgon Vestal Laboratories, Inc.
ACY	American Cyanamid Co.	HAL	C. P. Hall Co.
AGP	Dial Corp.	HCL	Hoechst Celanese Corp., Sou-Tex Works
AMU	American Emulsion	HDG	Hodag Chemical Corp.
APC	Apollo Chemicals Corp.	HEW	Hewitt Soap Co., Inc.
APX	Apex Chemical	HIL	Hilton Davis Company
ARC	Akzo Chemie America, Armak Chemicals	HIP	High Point Chemical Corp.
ARD	Ardmore Chemical Co. Inc.	HMP	W. R. Grace & Co., Hampshire Chemicals Div.
ARI	Atlas Refinery, Inc.	HNT	Huntington Laboratories, Inc.
ARL	Arol Chemical Products Co.	HPC	Hercules, Inc.
ARZ	Arizona Chemical Co.	HRT	Hart Products Corp.
BAS	BASF Corp.	HTN	Heterene Chemical Co.
BFP	Breddo Corp.	HXL	Hexcel Corp., Hexcel Chemical Products
BKM	Buckman Laboratories, Inc.	ICI	ICI Americas, Inc., Chemicals Div.
BLA	Astor Products, Inc., Blue Arrow Div.	JLP	J. L. Prescott Co.
BOE	Boehme Filatex, Inc.	JRG	Andrew Jergens Co.
BRD	Lonza, Inc.	JTO	Jetco Chemicals, Inc.
BRI	Sedgedief Specialties	KPI	Kenrich Petrochemicals, Inc.
BSW	Original Bradford Soap Works, Inc.	LEA	Leatex Chemical Co.
CAS	CasChem, Inc.	LEV	Lever Brothers Co.
CCA	Akzo Chemicals, Inc.	LKY	Lake States Div. of Rhineland Paper Co.
CCC	C.N.C. International, Inc.	LUR	Reilly Whitman, Inc.
CCL	Catawba-Charlab, Inc.	MAR	Dalshowa Chemicals, Inc.
CCW	Morton-Thiokol, Inc., Carstab Div.	MCP	Moretex Chemical Products, Inc.
CGY	Ciba-Geigy Corp.	MIL	Milliken & Co., Milliken Chemical Div.
CHL	Chemol Co.	MIR	Miranol Chemical Co., Inc.
CHP	C. H. Patrick & Co., Inc.	MOA	Mona Industries, Inc.
CIN	Stockhausen, Inc.	MON	Monsanto Co.
CLD	Colloids, Inc.	MRT	Morton-Thiokol, Inc., Morton Chemical Div.
CLU	CL Industries, Inc.	MRV	Marlowe-Van Loan Corp.
CMT	Chemithon Corp.	NCC	Niacet Corp.
CON	Concord Chemicals Co., Inc.	NES	Ruetgers-Nease Chemical Co.
CP	Colgate-Palmolive Co.	NMC	National Milling & Chemical Co.
CPC	Grant Industries, Inc.	NOC	Norac Co., Inc., Mathe Div.
CRD	Croda, Inc.	NPR	Safeway Stores, Inc.
CRT	Chemos Corp.	NSC	National Starch & Chemical Corp.
CTL	Continental Chemical Co.	OC	Omega Chemicals, Inc.
DAN	Dan River, Inc., Chemical Products Div.	OMC	Olin Corp.
DEX	Dexter Chemical Corp.	PAT	Pat-Chem, Inc.
DOW	Dow Chemical Co.	PCH	Prochem
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals & Pigments Dept.	PCI	Piedmont Chemical Industries, Inc.
ECC	Eastern Color & Chemical Co.	PEL	Pelron Corp.
EFH	E. F. Houghton & Co.	PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.
EK	Eastman Kodak Co.:	PIL	Pilot Chemical Co.
EKT	Tennessee Eastman Co. Div.	PLX	Desoto, Inc.
EMK	Emkay Chemical, Inc.	PNX	Murphy-Phoenix Co.
EMR	Quantum Chemical Corp., Emery Div.	PGG	PPG Industries, Inc.
ENJ	Exxon Chemical Americas	PSP	Georgia-Pacific Corp., Bellingham Div.
ENO	Enoco, Inc.	QCP	Quaker Chemical Corp.
ESS	Essential Industries, Inc.	RAY	ITT Rayonier, Inc.
ETC	Ethox Chemicals, Inc.		
FER	Ferro Corp., Keil Chemical Div.		
FPC	Flambeau Paper Corp.		
FTX	Finetex, Inc.		
GAF	GAF Corp., Chemical Group		

Table 38—Continued

Surface-active agents: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
REZ	Hi-Tek Polymers, Inc.	TCC	Sybron Chemicals, Inc.
RH	Rohm & Haas Co.	TCH	Quantum Chemical Corp.
ROB	Robeco Chemicals, Inc.	TEN	Tennessee Chemical Co.
RPC	Colloids, Inc.	TMH	Harcros Chemicals, Inc.
RSA	R.S.A. Corp.	TNA	Ethyl Corp.
S	Sandoz, Inc., Colors & Chemicals Div.	TNI	Gillette Co., Chemical Div.
SBC	Scher Chemicals, Inc.	TX	Texaco Inc., Texaco Chemical Co.
SBP	SBS Products Inc.	UCC	Union Carbide Corp.
SCO	Scholler, Inc.	UDI	Desoto, Inc.
SCP	Henkel Corp.	UNN	Unifed Aniline Co.
SDH	Sterling Drug, Inc.:	UPF	Sloss Industries
SDW	Sterling Organics Div.	USR	Uniroyal, Inc., Unroyal Chemical Div.
SHC	Shell Oil Co., Shell Chemical Co.	UTC	Unitex Chemical Corp.
SHX	Sherex Chemical Co., Inc.	VKR	Virkler Co.
SLC	Soluol Chemical Co., Inc.	VND	Van Dyk, Div. of Mallinckrodt, Inc.
SLM	Salem Oil & Grease Co.	VST	Vista Chemical Inc.
SOS	SSC Industries, Inc.	WHW	Whittemore-Wright Co., Inc.
SPA	Scott Paper Co.	WM	Inolex Chemical Co.
SQA	Sequa Chemicals, Inc.	WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
STP	Stepan Chemical Co.	WTC	Witco Chemical Corp.
SVC	Capital City Products Co., Armstrong Chemical Plant	WVA	Westvaco Corp.
SYL	Sylvachem Corp.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Item	Description	Quantity	Unit	Price	Total
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Section 13

Pesticides and Related Products

Pesticides and related products include fungicides, herbicides, insecticides, rodenticides, and related products such as plant growth regulators, seed disinfectants, soil conditioners, soil fumigants, and synergists. The data are given in terms of 100 percent active materials; they exclude such materials as diluents, emulsifiers, and wetting agents.

U.S. production of pesticides and related products in 1988 amounted to 1,164 million pounds, 12 percent more than the 1,040 million pounds reported for 1987 (table 39). Sales in 1988 were 935 million pounds, an increase of 3 percent, as compared with 911 million pounds reported in 1987; the value of sales was \$4,354 million in 1988, compared with \$4,171 million in 1987—an increase of 4 percent. Data for production of pesticides and related products during 1984-88 are shown in figure 14.

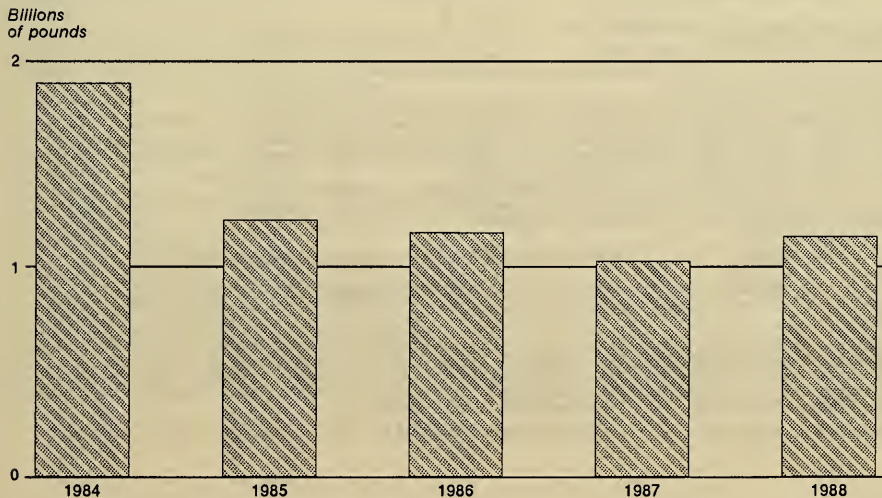
The output of cyclic pesticides and related products amounted to 760 million pounds in 1988, 17 percent more than the 647 million pounds produced in 1987. Sales in 1988 were 572 million pounds, valued at \$3,054 million, compared with 593 million pounds, valued at \$2,828 million, in 1987.

Production of acyclic pesticides and related products in 1988 amounted to 404 million pounds, compared with 392 million pounds reported for 1987. Sales in 1988 were 363 million pounds, compared with 318 million pounds reported for 1987; the value of sales were \$1,299 million in 1988, compared with \$1,342 million in 1987.

Table 40 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 41.

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202-252-1363

Figure 14
Pesticides and related products: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 39

Pesticides and related products: U.S. production and sales, 1988

Pesticides and related products	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	1,163,833	935,174	4,353,738	\$4.66
Cyclic				
Total	759,704	572,160	3,054,331	5.34
Fungicides, total	85,389	70,442	271,670	3.86
Naphthenic acid, copper salt	3,424	1,773	1,675	.94
All other cyclic fungicides ²	81,965	68,669	269,995	3.93
Herbicides and plant growth regulators, total	589,261	419,869	1,933,397	4.60
3',4'-Dichloropropanilide (Propanil)	13,038	(³)	(³)	(³)
Phenoxy acetic acid derivatives	65,564	52,614	45,224	.86
All other cyclic herbicides ⁴	510,659	367,255	1,888,173	5.14
Insecticides and rodenticides, total	85,054	81,849	849,264	10.38
Chlorinated Insecticides	3,703	4,007	13,462	3.36
Organophosphorus Insecticides ⁵	44,653	37,054	284,933	7.69
All other cyclic Insecticides and rodenticides ⁶	36,698	40,788	550,869	13.51
Acyclic				
Total	404,129	363,014	1,299,407	3.58
Fungicides ⁷	24,175	18,912	44,190	2.34
Herbicides and plant growth regulators ⁸	112,518	109,523	743,925	6.79
Insecticides, rodenticides, soil conditioners, and fumigants, total	267,436	234,579	511,292	2.18
Organophosphorus insecticides ⁹	93,865	57,739	275,488	4.77
All other acyclic insecticides, rodenticides, soil conditioners, and fumigants ¹⁰	173,571	176,840	235,804	1.33

¹ Calculated from unrounded figures.² Includes benomyl, captafol, captan, chlorothalonil, DMTT, folpet, pipron, PMA, and others.³ Reported data were accepted in confidence and may not be published, or no data were reported.⁴ Includes alachlor, atrazine, benefin, bensulfide, 2,4-D and other 2,4-D esters and salts, dicamba, dinitrophenol compounds, dluron, DNBP, isopropyl phenylcarbamates (IPC and CIPC), maleic hydrazide, molinate, NPA, picloram, triazines, trifluralin, uracils, plant growth regulators, and others.⁵ Includes diazinon, methyl parathion, and other phosphorothioates and phosphordithioates.⁶ Includes carbaryl, chlorinated insecticides (chloridan, heptachlor, and others), insect attractants, DEET and other insect repellents, small amounts of rodenticides, and others.⁷ Includes dithiocarbamates.⁸ Includes butylate, dalapon, EPTC, methanearsonic acid salts, thiocarbamates, and organophosphorus erbicides, and others.⁹ Includes acephate, disulfoton, ethion, malathion, phorate, and other organophosphorus insecticides.¹⁰ Includes aldicarb, methomyl, methyl bromide, soil conditioners and fumigants, small quantities of rodenticides, and others.

Note.—Does not include data for the insect fumigant, p-dichlorobenzene, nor the fungicide, o-phenylphenol. These data are included in the section on "Cyclic Intermediates." It also does not include data for the fungicides, dimethyldithiocarbamic acid, sodium salt and dimethyldithiocarbamic acid, zinc salt (i.e., ziram). These data are included in the section on "Rubber-Processing Chemicals." The data for ethylene dibromide, a fumigant, are included in the "Miscellaneous End-Use Chemicals and Chemical Products" section.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 40

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 41)
Cyclic:	Yes	
Fungicides:	Yes	
2-Bromo-4'-hydroxyacetophenone	No	BKM.
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-one	No	CHG.
α-(2-Chlorophenyl)-α-(4-chlorophenyl)-5-pyrimidinemethanol	No	LIL.
α-(2-Chlorophenyl)-α-(4-fluorophenyl)-5-pyrimidinemethanol	No	LIL.
2,4-Dichloro-6-(o-chloroanilino)-s-triazine	No	CHG.
1,4-Dichloro-2,5-dimethoxybenzene (Chloroneb)	No	CHF.
Diphenylmercuric dodecyl succinate	No	COS.
Hexahydro-1,3,5-triethyl-s-triazine	No	VNC.
Hexahydro-1,3,5-tri(2-hydroxyethyl)-s-triazine	No	(²).
2-Mercaptobenzothiazole, sodium salt	No	NOD, (²).
Methyl-1-(butylcarbamoyle)-2-benzimidazolecarbamate (Benomyl)	No	DUP, GTL.
2,2'-Methylenebis(4-chlorophenol) (Dichlorophene)	No	GIV.
3-(2-Methylperldino)propyl-3,4-dichlorobenzoate (Pipron)	No	LIL, USR.
5-Methyl-1,2,4-triazolo3,4-benzothiazole (Tricyclazole)	No	LIL.
Naphthenic acid, copper salt	Yes	CCA, MCI, NOD, TRO.
2-n-Octyl-4-isothiazolin-3-one	No	RH.
Pentachlorophenol, sodium salt	No	FRO.
Phenylmercuric acetate (PMA)	No	COS.
Phenylmercuric ammonium acetate	No	COS.
Phenylmercuric oleate	No	COS, TRO.
8-Quinolnol, copper salt	No	NOD.
8-Quinolnol, magnesium salt	No	FMT.
8-Quinolnol, sulfate salt	No	SOM.
2,4,5,6-Tetrachloroisophthalonitrile	No	SDS.
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (DMTT)	No	BKM, MRK, VCC.
2-(Thiocyanomethylthio)benzothiazole	No	BKM.
N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide (Captan)	No	ICI, VNC.
N-Trichloromethylthiophthalimide (Folpet)	No	ICI.
All other cyclic fungicides	No	FER, NOD.
Herbicides and plant growth regulators:	Yes	
4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	No	CHG, DUP.
4-Amino-3,5,6-trichloropicolinic acid (Picloram)	No	DOW.
4,6-Bis(isopropylamino)-2-methoxy-s-triazine (Prometon)	No	CGY.
2,4-Bis(isopropylamino)-6-(methylthio)-s-triazine (Prometryn)	No	CGY.
5-Bromo-3-sec-butyl-6-methyluracil (Bromacil)	No	DUP.
2-(sec-Butylamino)-4-ethylamino-6-methoxy-s-triazine	No	CGY.
3-tert-Butyl-5-chloro-6-methyluracil	No	DUP.
N-Butyl-N-ethyl-a,a,a-trifluoro-2,6-dinitro-p-toluidine (Benefin)	No	LIL.
Butyl 2-[4-[5-(trifluoromethyl)-2-pyridinyl]oxy]-phenoxy]propanoate	No	(²).
1-(Carboethoxy)ethyl 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoate	No	DOW, SOC.
2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	No	CGY.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

<i>Pesticides and related products</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 41)</i>
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
2-Chloro-4,6-bis(isopropylamino)-s-triazine (Propazine)	No	CGY.
2-Chloro-2',6'-diethyl-N-(n-butoxymethyl)-acetanilide (Butachlor)	No	MNA.
2-Chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide (Alachlor)	No	MNA.
2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)-acetamide (Acetochlor)	No	MNA.
2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene (Oxyfluorfen)	No	RH.
2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (Atrazine)	No	CGY, DUP.
2-[4-Chloro-6-(ethylamino)-s-triazin-2-ylamino]-2-methylpropionitrile (Cyanazine)	No	DUP.
2-Chloro-N-[isopropylacetanilide (Propachlor)	No	MNA.
2-Chloro-N-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-aminocarbonyl]benzenesulfonamide	No	DUP.
2-(4-Chloro-2-methylphenoxy)propionic acid, dimethylamine salt	No	RIV.
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolinone	No	FMN, (2).
2-[4-[6-Chloro-2-quinoxallinyloxy]phenoxy]propionil acid ethyl ester (Quizalofod ethyl)	No	DUP.
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	No	DUP.
3,6-Dichloro-2-anisic acid (Dicamba)	No	ZOC.
2,6-Dichlorobenzonitrile	No	USR.
2-(2,4-Dichlorophenoxy)propionic acid, dimethylamine salt	No	RIV.
2-(2,4-Dichlorophenoxy)propionic acid, isooctyl ester	No	RIV.
3-(3,4-Dichlorophenyl)-1,1-dimethylurea (Diuron)	No	DUP.
3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea (Linuron)	No	DUP.
2-(3,4-Dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione (Methazole)	No	ZOC.
1-(2,4-Dichlorophenyl)4-propyl-1,3-dioxolan-2-ylmethyl-1H-1,2,4-triazole	No	ICI.
2-(3,5-Dichlorophenyl)-2-(2,2,2-trichloroethyl)-oxirane (tridiphane)	No	ICI.
3',4'-Dichloropropionilide (Propanil)	Yes	CED, CYT, RH.
3,7-Dichloro-8-quinolnic acid	No	NES.
S-(O,O-Diisopropyl phosphorodithioate) ester of N-(α -mercaptoethyl)benzenesulfonamide (Bensulide)	No	ICI.
1,1'-Dimethyl-4,4'-bipyridinium dichloride	No	ICI, (2).
N,N-Dimethyl-2,2-diphenylacetamide (Diphenamid)	No	CWN.
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	No	SDS.
N-5-1,1-Dimethyl)-1,3,4-thiadiazol-2-yl-N,N-dimethylurea (Tebuthiuron)	No	LIL.
1,1-Dimethyl-3-(α , α , α -trifluoro-m-tolyl)urea (Fluometuron)	No	CGY.
Dinitrobutylphenol (DNBP)	No	CED.
Dinitrobutylphenol, triethanolamine salt	No	CED.
2,6-Dinitro-N,N-dipropyl cumidine	No	LIL.
3,5-Dinitro-N,N-dipropylsulfanilamide	No	(2).
2-(Ethylamino)-4-(isopropylamino)-6-(methylthio)-s-triazine (Ametryne)	No	CGY.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 41)
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
Ethyl 2-[[[(4-chloro-6-methoxy-pyrimidin-2-yl)-amino]carbonyl]amino]sulfonyl]benzoate (Chlorimuron ethyl)	No	DUP.
S-Ethyl cyclohexylmethylthiocarbamate	No	ICI.
S-Ethyl-hexahydro-1H-azepine-1-carbothioate (Molinate)	No	ICI.
N-[3-(1-Ethyl-1-methylpropyl)-5-isoxazoly]-2,6-dimethoxybenzamide (Flexidor)	No	LIL.
N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzamine	No	ACY.
Isopropyl N-(3-chlorophenyl)carbamate (CIPC)	No	PPG, SOC.
2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanolamine salt	No	RIV.
2-(2-Methyl-4-chlorophenoxy)propionic acid, isooctyl ester	No	RIV.
1-(2-Methylcyclohexyl)-3-phenylurea (Slduron)	No	ADC, DUP.
Methyl 2-[[[(4,6-dimethoxy-pyrimidin-2-yl)-amino]carbonyl]amino]sulfonyl]methyl]benzoate (Bensulfuron) (Londax)	No	DUP.
Methyl 2-[[[(4,6-dimethyl-2-pyrimidinyl)amino]carbonyl]amino]sulfonyl]benzoate	No	DUP.
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridone (Fluridone)	No	LIL.
N-1-Naphthylphthalamic acid (NPA)	No	USR.
7-Oxabicyclo-[2.2.1]-heptane-2,3-dicarboxylic acid, disodium salt (Endothal)	No	PAS.
Phenoxyacetic acid derivatives:	Yes	
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt	No	RIV.
4-Chloro-2-methylphenoxyacetic acid, isooctyl ester	No	RIV.
2,4-dichlorophenoxyacetic acid, esters and salts:		
2,4-Dichlorophenoxyacetic acid (2,4-D)	No	DOW, GTH.
2,4-Dichlorophenoxyacetic acid, sec-butyl ester	No	DOW.
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	No	DOW, PBI, RIV.
2,4-Dichlorophenoxyacetic acid, ethanolamine and isopropanolamine salts	No	DOW, RIV.
2,4-Dichlorophenoxyacetic acid, isooctyl ester	No	AMV.
2,4-Dichlorophenoxyacetic acid, isopropyl ester	No	
Plant growth regulators:		
N-[Acetylamino]methyl]-2-chloro-N-(2,6-diethylphenyl)acetamide	No	MNA.
α -(4-Chlorophenyl)methyl- α -(1,1-dimethylethyl)-1,2,4-triazole-1-ethanol	No	(?)
2-Chloro-6-(trichloromethyl)pyridine	No	DOW.
α -Cyclopropyl- α -(p-methoxyphenyl)-5-pyrimidine methanol (Ancymidol)	No	LIL.
2,4-Dichlorobenzyltributylphosphonium chloride	No	USR.
2,3-Dihydro-5,6-dimethyl-1,4-dithiin-1,1,4,4-tetraoxide	No	NES.
1,1-Dimethylpiperidinium chloride	No	BAS.
N-[2,4-dimethyl-5-[[trifluoromethyl]sulfonyl]-amino]phenyl]acetamide, diethanolamine salt	No	MMM.
Gibberellic acid	No	ABB.
α -(1-methylethyl)- α -[4-trifluoro-methoxy]phenyl]-5-pyrimidinemethanol (Flurprimidol)	No	LIL.
3,5,6-Trichloro-2-pyridinyloxyacetic acid	No	DOW.
α , α , α -Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (Trifluralin)	No	LIL.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 41)
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
Plant growth regulators—Continued		
α, α, α -Trifluoro-2,6-dinitro-N-ethyl-N-(2-methyl-2-propenyl)-p-toluidine (Ethylfluralin)	No	LIL.
All other cyclic herbicides	No	FRI, RH, SOC.
Insect attractants and repellents:		
N,N-Diethyltoluamide (DEET)	No	HCL, MRF, TNA.
All other insects attractants	No	ICI.
Insecticides:		
Bacillus thuringiensis	No	ABB, ZOC.
Bis(pentachloro-2,4-dicyclopentadien-1-yl)	No	ZOC.
2,3,4,5- δ^2 -Butenylene-tetrahydrofurfural	No	PLC.
2-(p-tert-Butylphenoxy)cyclohexyl-2-propenyl sulfite	No	ACY, USR.
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloro-ethenyl)-2,2-dimethylcyclopropane carboxylate	No	FMN.
Cyano-3-phenoxybenzyl-cis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	No	(²).
Cyano(3-phenoxyphenyl)methyl-4-chloro- α -(1-methylethyl)benzeneacetate	No	DUP.
All other cyclic Insecticides	No	FMN, ZOC, (²).
Cypermethrin	No	CED, FMN.
O,O-Diethyl O-(2-diethylamino-6-methyl-4-pyrimidinyl)phosphorothioate	No	(²).
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl [(dibutylamino)thio]methyl carbamate	No	FMN, NES.
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate	No	FMN.
2,3-dihydroxy-2,2-dimethyl-7-benzofuranyl	No	(²).
DI-n-propylisocinchomeronate	No	MGK.
Distinnaxane, hexakis(2-methyl-2-phenylpropyl)	No	DUP.
Methyl 3-[2,2-dichloroethenyl]-2,2-dimethyl-3-cyano-3-phenoxyphenylcyclopropanecarboxylate	No	FMN.
3-(Phenoxyphenyl) methyl-cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropane-carboxylate	No	CED, FMN, (²).
Tetrahydro-3,5-dimethyl-2(1H)-pyrimidinone [3-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]ethenyl]-2-propenylidene] hydrozone	No	ACY.
Tricyclohexyltin hydroxide	No	DOW.
Chlorinated Insecticides:		
2-Chloro-N-[[[4-(trifluoromethoxy)phenyl] amino]-carbonyl]benzamide	No	CHG.
Heptachloro-tetrahydro-endo-methanindene (Heptachlor)	No	VEL.
Octachlorohexahydro-4,7-methanindene (Chlordan)	No	VEL.
1,1,1-Trichloro-2,2-bis(p-methoxyphenyl)ethane (Methoxychlor)	No	CHF.
All other chlorinated Insecticides, cyclic	No	DUP.
Organophosphorus Insecticides:		
O-(2,4-Dichlorophenyl) O-ethyl S-propyl phosphorodithioate	No	CHG.
O-(2-(Diethylamino)-6-methyl (4-pyrimidinyl) O,O-dimethyl phosphorothioate	No	(²).
O,O-Diethyl O-[4-(methylsulfinyl)phenyl-] phosphorothioate	No	CHG.
O,O-Diethyl O-3,5,6-trichloro-2-pyridyl-phosphorothioate	No	DOW.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 41)
Cyclic—Continued		
Insecticides—Continued		
Organophosphorus insecticides—Continued		
O,O-Dimethyl O-4-(methylthio)-m-tolyl-phosphorothioate (Fenthion)	No	CHG.
O,O-Dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(3H)-yl)methyl]phosphorodithioate (Azinphos-methyl)	No	CHG, DUP.
O-Ethyl O-[4-(methylthio)phenyl] S-propyl phosphorodithioate	No	CHG.
N-(Mercaptomethyl)phthalimide S-(O,O-dimethylphosphorodithioate)	No	ICI.
O,O'-(Thiodi-4,1-phenylene)bis(O,O-dimethyl-phosphorothioate (Tempos)	No	ICI.
Rodenticides:		
3-(α -Acetonylbenzyl)-4-hydroxycoumarin (Warfarin)	No	MOT.
3-[3-(4'-Bromo[1,1'-biphenyl]-4-yl)-1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-2H-1-benzopyran-2-one	No	LIL, (2).
2-Diphenylacetyl-1,3-indandione and sodium salt	No	MOT.
2-Isovaleryl-1,3-indandione	No	MOT.
2-Pivaloyl-1,3-indandione (Plindone)	No	MOT.
All other cyclic pesticides:		
Benzyl-2-chloro-4-(trifluoromethyl)-5-thiazolecarboxylate	No	MNA.
α -[2-(2-n-Butoxyethoxy)ethoxy]-4,5-methyleneedioxy-2-propyltoluene (Piperonyl butoxide)	No	ALP, TNA.
N,N-diallyl-2,2-dichloroacetamide	No	ICI.
N-(2-Ethylhexyl)bicyclo(2.2.1)-5-heptene-2,3-dicarboximide	No	MGK.
1-Methyl-3,5,7-triaza-1-azonia tricyclodecane chloride	No	BKM.
2,2,5-Trimethyl-3-(dichloroacetyl)-1,3-oxazolidine	No	ICI.
All other pesticides and related products, cyclic	No	(2).
Acyclic:		
Fungicides:		
Bis-1,4-bromoacetoxy-2-butene	No	VIN.
Bis(tributyltin) oxide	No	(2).
1,2-Dibromo-2,4-dicyanobutane	No	MRK.
Disodium cyanodithioimidocarbonate	No	BKM.
n-Dodecylguanidine acetate (Dodine)	No	ACY.
Dodecylguanidine hydrochloride	No	MRK.
Methylenebis(thiocyanate)	No	MRK, VIN.
Poly[oxyethylene(dimethylimino)-ethylene(dimethylimino)ethylene dichloride]	No	BKM.
Tributyltin chloride	No	(2).
Dithiocarbamic acid fungicides:		
Dimethyldithiocarbamic acid, potassium salt	No	ALC, BKM.
Ethylene bis(dithiocarbamic acid), disodium salt (Nabam)	No	ALC, VCC.
Ethylene bis(dithiocarbamic acid), manganese salt with zinc ions	No	DUP.
Ethylene bis(dithiocarbamic acid), zinc and manganese salts	No	RH.
Hydroxymethyl(methyl)dithiocarbamic acid, potassium salt	No	BKM.
N-Methyldithiocarbamic acid, potassium salt	No	BKM.
Herbicides and plant growth regulators:		
2,2-Dichloropropionic acid, sodium salt (Dalapon)	No	DOW.
Dimethylarsinic acid (Cacodylic acid)	No	VIN.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 41)
Acyclic—Continued		
Herbicides and plant growth regulator—Continued		
S-Ethyl diisobutylthiocarbamate (Butylate)	No	ICI, PPG, SOC.
S-Ethyl dipropylthiocarbamate (EPTC)	No	ICI, PPG, SOC.
Methanearsonic acid, disodium salt (DSMA)	No	VIN.
Methanearsonic acid, dodecyl- and octyl- ammonium salts	No	VIN.
Methanearsonic acid, monosodium salt (MSMA)	No	SDS, VIN.
Methylthiosulfonic acid, S-(2-hydroxypropyl) ester	No	BKM.
N-(Phosphonomethyl)glycine, isopropylamine salt	No	MNA.
S-Propyl butylethylthiocarbamate (Pebulate)	No	ICI.
S-Propyl dipropylthiocarbamate (Vernolate)	No	ICI.
Thiocyanic acid, methylene ester	No	BKM.
S,S,S-Tributyl phosphorothioate	No	CHG.
Plant growth regulators:		
6-Benzyladenine (BAP)	No	ABB.
N-(Phosphonomethyl)glycine, sodium sesqui salt	No	MNA.
All other plant growth regulators:	No	USR.
All other acyclic herbicides	No	DUP, VIN.
Insecticides:		
Ethyl 3,7,11-trimethyldeca-2,4-dienoate	No	DOW, ZOC, (2).
Isopropyl-11-methoxy-3,7,11-trimethyldeca-2,4-dienoate	No	ZOC, (2).
Methyl N',N'-dimethyl-N-[(methylcarbamoil)oxy]-1-thiooxamide	No	DUP.
S-Methyl-N-[(methylcarbamoil)oxy]thioacetimide (Methomyl)	No	DUP.
Organophosphorus Insecticides:		
S-[1,2-Bis(ethoxycarbonyl)ethyl]O,O-dimethyl phosphorodithioate (Malathion)	No	ACY.
2-Carbomethoxy-1-propen-2-yl dimethyl phosphate	No	AMV, DUP.
1,2-Dibromo-2,2-dichloroethyl dimethyl phosphate (Naled)	No	AMV.
O,O-Diethyl S-[2-(ethylthio)ethyl]phosphorodithioate (Disulfoton)	No	CHG.
O,O-Diethyl S-[(ethylthio)methyl] phosphorodithioate (Phorate)	No	ACY.
3-(Dimethoxyphosphinyloxy)-N,N-dimethyl-cis-crotonamide	No	DUP.
O,S-Dimethylacetylphosphoramidothioate (Acephate)	No	SOC.
O,O-Dimethyl-O-2,2-dichlorovinyl phosphate (DDVP)	No	AMV.
S-[[[1,1-Dimethylethyl]thio]methyl]O,O-diethyl phosphorodithioate (Turbufos)	No	ACY.
Dimethyl phosphate of 3-hydroxy-N-methyl-cis-crotonamide	No	DUP.
O,S-Dimethyl phosphoramidothioate	No	CHG.
O-Ethyl S,S-di-sec-butyl phosphorodithioate	No	FMN, NES.
O,O,O',O'-Tetraethyl S,S'-methylene bisphosphoro-dithioate (Ethion)	No	FMN, SHC.
All other acyclic insecticides	No	
Rodenticides:		
2-Hydroxyethyl n-octyl sulfide	No	PLC.
Sodium fluoroacetate	No	TUL.
Soil fumigants:		
1,3-Dichloropropene	No	DOW.
Methyl bromide (Bromomethane)	No	GTL, TNA.
N-Methylthiocarbamic acid, sodium salt (Metham)	No	AMV, BKM, CED, ICI.
Methyl isothiocyanate and 1,3-dichloropropene	No	MRT.
Trichloronitromethane (Chloropicrin)	No	LCP, NLO, TNA, WCL.
All other acyclic pesticides:	No	
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	No	(2).
N-Alkyl-1-naphthylmethyl ammonium chloride	No	ARS.
Ammonium oxydiethylenebis (alkyl* dimethyl chloride) *Alkyl-40% C, 50% C, 10% C	No	BKM.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 41)
Acyclic—Continued		
All other acyclic pesticides—Continued		
Bromoacetic acid	No	VIN.
N-Cocoalkyl-1,3-propylenediamine acetate	No	(²).
2-[(Hydroxymethyl)amino]-2-methylpropanol	No	TRO.
2-(Hydroxymethyl)ethanol	No	TRO.
3-Iodo-2-propynyl butylcarbamate	No	TRO.
All other pesticides and related products, acyclic	No	CWN, USR, ZOC, (²).

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 41

Pesticides and related products: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	LIL	Eli Lilly & Co.
ACY	American Cyanamid Co.	MCI	Mooney Chemical, Inc.
ADC	Anderson Development Co.	MGK	McLaughlin Gormley King Co.
ALC	Alco Chemical Corp.	MMM	Minnesota Mining & Manufacturing Co.
ALP	Alpha Laboratories, Inc.	MNA	Monsanto Agriculture Co.
AMV	Amvac Chemical Corp.	MOT	Motomco, Ltd.
BAS	BASF Corp.	MRF	Morfex Chemical Co., Inc.
BKM	Buckman Laboratories, Inc.	MRK	Merck & Co., Inc.
CCA	Akzo Chemicals, Inc.	MRT	Morton-Thiokol, Inc., Morton Chemical Div.
CED	Cedar Chemical Co.	NES	Ruetgers-Nease Chemical Co.
CGY	Ciba-Gelgy Corp.	NLO	Niklor Chemical Co., Inc.
CHF	Kincaid Enterprises, Inc.	NOD	Huls America, Inc.
CHG	Mobay Chemical Corp., Agricultural Chemicals Div.	PAS	Pennwalt Corp.
COS	Cosan Chemical Corp.	PBI	PBI-Gordon Corp.
CWN	Upjohn Co., Fine Chemicals	PLC	Phillips 66 Co.
CYT	Cumberland International Corp.	PPG	PPG Industries, Inc.
DOW	Dow Chemical Co.	RH	Rohm & Haas Co.
DUP	E. I. duPont de Nemours & Co., Inc. Agricultural Products	RIV	Riverdale Chemical Co.
FER	Ferro Corp., Ferro Chemical Div.	SDS	Fermenta Plant Protection
FMN	FMC Corp., Agricultural Chemical Group	SHC	Shell Oil Co., Shell Chemical Co.
FMT	Fairmount Chemical Co., Inc.	SOC	Chevron Corp., Chevron Chemical Co.
FRI	Farmland Industries, Inc.	SOM	Southland Corp.
FRO	Vulcan Materials Co., Chemicals Div.	TNA	Ethyl Corp.
GIV	Givaudan Corp.	TRO	Troy Chemical Corp.
GTH	Guth Corporation	TUL	Tull Chemical Co., Inc.
GTL	Great Lakes Chemical Corp.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
HCL	Hoescht Celanese Corp., Fine Chemicals, Div.	VCC	Vinings Chemical Co.
ICI	ICI Americas Inc., Agricultural Chemicals Div.	VEL	Velsicol Chemical Corp.
LCP	LCP Chemicals-Maine	VIN	Vineyard Chemical Co., Inc.
		VNC	Vanderbilt Chemical Corp.
		WCL	Wright Chemical Corp.
		ZOC	Sandoz Crop Protection

Note.— Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 14

Miscellaneous End-Use
Chemicals and Chemical
Products

This section incorporates those end-use groups which are not readily classifiable within the prior sections of this report. Both cyclic and acyclic chemicals fall within this section. Production and sales of the end-use chemicals contained within this section continue to follow a general increase since 1985.

In 1988, the production of miscellaneous end-use chemicals amounted to 28,528 million pounds, an increase of 13.1 percent from the more than 25,223 million pounds of production reported for 1987. Production of these chemicals remained nearly level but steadily increasing throughout 1985-88 (figure 15). Sales in 1988 totaled 22,518 million pounds, valued at \$9,449 million (table 42). The sales quantity increased 7.2 percent from that of 1987 with the value of sales increasing by 28.5 percent. Polymers for fibers and end uses of urea collectively accounted

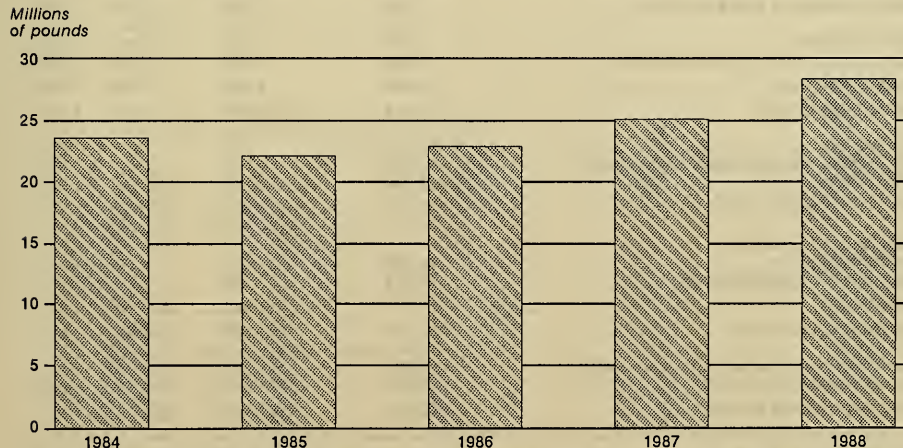
for 64.8 percent of the 1988 production of these miscellaneous end-use chemicals. The total published end-uses for urea accounted for 47.9 percent of the 1988 sales quantity of these chemicals.

Production of end-use chemicals used in the auto and motor fuels market indicated continued upward trends. Production of fuel additives for 1988 totaled 6,114 million pounds, an increase of 57.7 percent from the previous year. Approximately 92.9 percent of production in this category was methyl t-butyl ether. The increase of 61.6 percent in reported production from 1987 is due to the increasing end-uses of this chemical as an octane enhancer as well as an increase in the number of companies that had previously misstated production or failed legal reporting requirements.

Table 43 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 44.

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Figure 15
Miscellaneous End-Use Chemicals and Chemical Products: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 14

Table 42

Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1988

Miscellaneous end-use chemicals and chemical products	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	28,527,873	22,518,071	9,448,536	\$0.42
Chelating agents, nitriloacids and salts, total	276,302	214,838	137,129	.64
(Diethylenetri(nitrilo)pentaacetic acid, pentasodium salt	16,286	15,942	9,900	.62
(Ethylenedinitrilo) tetraacetic acid (EDTA)	7,515	5,351	4,758	.89
(Ethylenedinitrilo)tetraacetic acid, diammonium salt ...	3,222	2,171	1,318	.61
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	535	206	343	1.67
(Ethylenedinitrilo)tetraacetic acid, disodium salt	1,852	1,838	3,221	1.75
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	2,106	1,940	2,717	1.40
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt ...	82,375	54,662	33,852	.62
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt	10,986	4,125	2,757	.67
All other chelating agents, nitriloacids and salts	151,425	128,603	78,263	.61
Chemical indicators	4	4	417	104.25
Chemical reagents and fine chemicals	485	433	33,197	76.67
Enzymes:				
Bacterial amylase	(²)	(²)	21,930	(²)
Pectinase	(²)	(²)	1,240	(²)
Proteases, total	(²)	(²)	40,102	(²)
Rennin	(²)	(²)	16,192	(²)
All other proteases	(²)	(²)	23,910	(²)
Flotation reagents	19,180	19,701	7,518	.38
Fuel additives, total ³	6,114,019	4,813,892	1,303,669	.27
Methyl t-butyl ether ^{4, 5}	5,679,953	4,493,960	951,277	.21
All other fuel additives	434,066	319,932	352,392	1.10
Lubricating oil and grease additives, total	667,794	577,000	403,853	.70
Oil soluble petroleum sulfonate, barium salt	8,671	8,563	7,354	.86
Oil soluble petroleum sulfonate, calcium salt	218,733	166,607	108,842	.65
All other lubricating oil and grease additives	440,390	401,830	287,657	.72
Paint driers, naphthenic acid salts, total ^{6, 7}	7,525	7,299	11,075	1.52
Cobalt naphthenate	2,780	2,827	6,883	2.43
All other paint driers, naphthenic acid salts	4,745	4,472	4,192	.94
Photographic chemicals	18,669	8,274	48,263	5.83
Polymers for fibers, total ⁸	6,819,814	3,630,338	4,753,634	1.31
Nylon 6 and 6/6 ⁴	2,450,025	(²)	(²)	(²)
Polyacrylonitrile and acrylonitrile copolymers ⁸	566,509	(²)	(²)	(²)
All other polymers for fibers	3,803,280	3,630,338	4,753,634	1.31
Polymers, water soluble, total	696,039	614,382	672,472	1.10
Cellulose esters and ethers:				
Hydroxyethylcellulose	32,869	(²)	(²)	(²)
Sodium carboxymethylcellulose	49,673	(²)	(²)	(²)
Polyacrylamide	(²)	37,484	39,998	1.07
Polyacrylic acid salts, total	250,206	218,931	205,348	.94
Sodium ammonium polyacrylate and copolymers	116,581	106,014	101,420	.96
All other polyacrylic acid salts	133,625	112,917	103,928	.92
All other water soluble polymers	363,291	357,967	427,126	1.19

See footnotes at end of table.

Table 42—Continued

Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1988

Miscellaneous end-use chemicals and chemical products	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Poly- α -olefins	139,015	133,854	137,351	\$1.03
Tanning materials synthetic	39,274	25,735	19,738	.77
Textile chemicals, other than surface-active agents, total	78,442	55,664	42,735	.77
Urea polymers with formaldehyde and methanol	570	501	263	.53
All other textile chemicals, other than surface-active agents	77,872	55,163	42,472	.77
Urea in compounds or mixtures:				
In feed compounds	382,330	364,914	31,373	.09
In liquid fertilizer	2,556,005	2,111,403	282,093	.13
In solid fertilizer	8,724,077	8,080,520	480,779	.06
All other miscellaneous end-use chemicals and chemical products ⁹	1,988,899	1,859,820	1,019,968	.55

¹ Calculated from unrounded figures.² Reported data were accepted in confidence and may not be published, or no data were reported.³ Statistics exclude production and sales of tricresyl phosphate. Statistics on tricresyl phosphate are given with the section on "Plasticizers."⁴ The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resins Materials, 1988)*, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustment, and rounding.⁵ Production totals shown for this chemical include quarterly production data in instances where companies reported inaccurate annual data or failed to report annual data. Totals also include reporting by companies which failed to report on a quarterly basis.⁶ Quantities are given on the basis of solid naphthenate.⁷ Statistics exclude production and sales of copper naphthenate. Statistics for copper naphthenate are given in the section on "Pesticides and Related Products."⁸ Quarterly production data for polyethylene terephthalate are incorrect due to inaccurate reporting. Annual production figures cannot be published because disclosure would result.⁹ Production totals shown for this chemical include quarterly production in instances where annual data were determined to be inaccurate.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 43

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 44)
Amino acids and their salts:		
Aspartic acid	No	PFZ.
N,N-Bis(2,2-acetamido)glycine	No	PIC.
N,N-Dimethylglycine	No	MCK.
N,N-Dimethylglycine hydrochloride	No	MCK.
Glutamic acid hydrochloride	No	LEM.
Glycine (Aminoacetic acid), non-medical	No	CHT, HMP.
Phenyl alanine	No	NSW.
Potassium glutamate	No	LEM.
Methionine and its salts:		
Methionine (animal feed grade)	No	DGC.
Methionine, hydroxy analogue, calcium salt	No	MNA.
Protein hydrolysates	No	BRS.
Sarcosine	No	HMP.
All other amino acids and salts, cyclic	No	AJL, HCC.
Biological stains:		
Biological stains	No	ALD, EK.
Chelating agents, nitriloacids and salts:		
N-Alkylamine bismethylenephosphonic acid	No	DUP.
N-Alkylaminobismethylene phosphonic acid salts	No	(²).
(Diethylenetriamine)pentamethylenephosphonic acid	No	MYO, OMC.
(Diethylenetriamine)pentamethylenephosphonic acid, sodium salt	No	MYO, OMC.
(Diethylenetriamino)pentaacetic acid	No	CGY, DOW, HMP.
(Diethylenetriamino)pentaacetic acid, monosodium hydrogen ferric salt	No	CGY.
(Diethylenetriamino)pentaacetic acid, pentasodium salt	Yes	CGY, DOW, HMP.
N,N-Dihydroxyethylglycine, sodium salt	No	HMP.
Ethanolglycine, disodium salt	No	HMP.
(Ethylenedinitrilo)tetraacetic acid		
(Ethylenediaminetetraacetic acid) (EDTA)	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	No	CGY, DAN, DOW.
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, dipotassium salt	No	EK.
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	Yes	CGY, DAN, DOW, HMP, PLC.
(Ethylenedinitrilo)tetraacetic acid, disodium salt	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	No	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, magnesium salt	No	SHC, TX.
(Ethylenedinitrilo)tetraacetic acid, manganese salt	No	CGY, HMP.
(Ethylenedinitrilo)tetraacetic acid, monoammonium ferric salt	No	DOW.
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	Yes	CGY, FER, HMP.
(Ethylenedinitrilo)tetraacetic acid, tetraammonium salt	No	CGY, DOW.
(Ethylenedinitrilo)tetraacetic acid, tetrapotassium salt	No	HMP, (²).
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, trisodium salt	No	CGY, HMP, TX.
Glucoheptonic acid, β -isomer, sodium salt	No	BLZ.
Glucoheptonic acid, sodium salt	No	BLZ, PFN.
Hexamethylenediaminetetra(methylenephosphonic acid), potassium salt	No	MYO, OMC.
Hydroxyethane-1-diphosphonic acid	No	MYO.
(N-Hydroxyethylethylenedinitrilo)triacetic acid, iron salt	No	DOW, HMP.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 44)
Chelating agents, nitriloacids and salts—Continued		
(N-Hydroxyethylthylenedinitrilo)triacetic acid, magnesium salt	No	DOW, HMP.
(N-Hydroxyethylthylenedinitrilo)triacetic acid, trisodium salt	Yes	CGY, DOW, HMP. (2).
Hydroxyethylidene diphosphonic acid, potassium salt	No	MYO, (2).
Hydroxyethylidene diphosphonic acid, sodium salt	No	HMP.
Nitriloacetic acid, zinc salt	No	HMP, MON.
Nitrilotriacetic acid	No	HMP.
Nitrilotriacetic acid, trisodium salt	No	BKM, MYO, OMC, (2).
Nitrilo-tris-methylene triphosphonic acid	No	(2).
Nitrilo-tris-methylene triphosphonic acid, potassium salt	No	MYO, OMC, (2), (2).
Nitrilo-tris-methylene triphosphonic acid, sodium salt	No	(2).
2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	No	(2), (2).
Polyamine polymethane phosphonic acid	No	RPC.
Polyamine polymethane phosphonic acid, magnesium salt	No	BKM, CGY, HMP, OMC, SCP, (2).
All other chelating agents, nitriloacids and salts	No	
Chemical indicators:		
Chemical indicators	Yes	ALD, EK, GFS.
Chemical reagents and fine chemicals:		
Chemical reagents and fine chemicals	Yes	ALD, EK, ENJ, GFS, HMY, PAH, PFN, PIC, PLB, REG, RSA, UPJ, UPM, (2).
Enzymes:		
Hydrolytic enzymes:		
Amylases:		
Bacterial amylase	Yes	GBF, GNR, MLS, NBI, PMP.
Glucoamylase	No	GBF, MLS, NBI.
Maltase	No	PFZ.
All other amylases	No	GBF, TX.
Proteases:		
Papain	No	GBF, PFZ.
Pepsin	No	CHH.
Protease (bacterial)	No	NBI.
Rennin	Yes	CHH, MLS, PFZ.
All other proteases	No	GBF, GNR, MLS, SPR.
Other hydrolytic enzymes:		
Cholesterol esterase	No	BCK, MLS.
Hydrolytic enzyme mixtures	No	JFR.
Lipase	No	CHH, GNR.
Pectinase	Yes	GBF, GNR, MLS.
Other hydrolytic enzymes	No	GNR, MLS, PMP, (2).
Non-hydrolytic enzymes:		
Cholesterol oxidase	No	BCK, UPJ.
Glucose oxidase	No	BCK.
Glucose-6-phosphate dehydrogenase	No	BCK.
Glycerol kinase	No	BCK.
Uricase	No	BCK.
Flotation reagents:		
Allyl n-butyl trithiocarbonate	No	CED.
Phosphorodithioates, used as flotation reagents:		
Dicresylphosphorodithioic acid	No	ACY, (2).
Dicresylphosphorodithioic acid, ammonium salt	No	ACY.
Dicresylphosphorodithioic acid, sodium salt	No	(2).
Rosin amines	No	HPC, SHX.
Sodium n-butylxanthate	No	USR.
Thiocarbamide (Diphenylthiourea)	No	ACY.
Xanthates and sulfides, used as flotation reagent:		
All other flotation reagents	No	CXI, DAN, ELC, SHX, (2).

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 44)
Fuel additives:		
Diesel fuel additives:	Yes	
Hexyl nitrate	No	DUP.
All other diesel fuel additives, acyclic	No	TNA.
All other diesel fuel additives, cyclic	No	PAH.
Fuel oil additives:		
Adipic acid-diethylenetriamine-epichlorohydrin polymer	No	(²).
Di-tert-amyl-phenyl acid phosphate	No	ALW.
4,4'-Di-sec-butylaminodiphenylmethane	No	UPM.
N,N-Dimethyl-1,3-propanediamine polymer with epichlorohydrin, sulfate	No	(²).
N,N'-Disalicylidene-1,2-propanediamine	No	DUP, FER, SM, TNA.
Ethoxylated hydantoin glycol dicocotate	No	BRD.
Formaldehyde polymer with ethylenediamine and nonyl phenol derivatives	No	(²).
Imidazoline from tall oil fatty acids and diethylenetriamine	No	(²).
Methylene-bis(dimethyl)hydantoin and derivatives	No	BRD.
Mixed aryl diimides	No	SM.
Phenyl acid phosphate	No	HDG.
Polybutylether carbamate	No	SOC.
Poly(dimethylimino(2-hydroxytrimethylene)chloride)	No	(²).
Polyethylenepolyamine polymer with 1,4-dihydroxy-2-butyne	No	(²).
Rust preventing additives	No	ALX.
Tetrahydropyrimidine from tall oil fatty acids and propylenediamine	No	(²).
All other fuel additives, acyclic	No	DUP, SM, UPM, (²).
Gasoline additives:		
N,N'-Di-sec-butyl-p-phenylenediamine	No	DUP, TNA, UPM.
N,N'-Diisopropyl-p-phenylenediamine	No	DUP, TNA.
Ethylene dibromide	No	GTL, TNA.
Methyl-t-amyl ether	No	CXI.
Methyl-t-butyl ether	Yes	AMO, ATR, CGO, CO(E), CSD, CSP, DA, ENJ, GRS, LYP, PLC, SOG, SUN, TPC, TX, VLR.
Methylcyclopentadienylmanganese tricarbonyl	No	TNA.
N-(1-Methylheptyl)ethanolamine	No	UPM.
Tetraethyl lead	No	DUP.
All other gasoline additives, acyclic	No	TNA, TX, UPM, (²).
All other gasoline additives, cyclic	No	VNC, (²).
Lubricating oil and grease additives:		
Chlorosulfurizer and sulfurized compounds:		
Chlorosulfurized sperm oil	No	ELC.
Sulfurized lard oil	No	CCW, QCP.
Sulfurized sperm oil substitutes	No	CCW, ELC.
Dodecyl succinic anhydride	No	TX.
Hydrocarbon carboxylic acid derivatives	No	EMR, (²), (²), (²).
Hydrocarbon phosphorous acid, barium salt	No	(²).
Hydrocarbon phosphoryl derivatives	No	(²).
Methylene-bridged polyalkyl phenols	No	TX.
Oleyl acid phosphate	No	FER.
Oxidized hydrocarbon mixture	No	ALX, ELC.
Oil-soluble petroleum sulfonates:		
Oil-soluble petroleum sulfonate, ammonium salt	No	ENJ.
Oil-soluble petroleum sulfonate, barium salt	Yes	PAR, TNA, WTC, (²).
Oil-soluble petroleum sulfonate, calcium salt	Yes	PAR, SOC, TNA, TX, WTC, (²).
Oil-soluble petroleum sulfonate, magnesium salt	No	WTC, (²).
Oil-soluble petroleum sulfonate, sodium salt	No	GAF, PAR.
All other oil-soluble petroleum sulfonate	No	DUP, MON, SOC.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 44)
Lubricating oil and grease additives—Continued		
Phenol salts:		
Alkyl phenols	No	(²).
Dodecylphenol, sulfurized, calcium salt	No	SOC.
Nonylphenol, barium salt	No	CCA, FER, WTC.
All other phenol salts	No	TNA.
Phosphorodithioates (dithiophosphates):		
Alkene thiophosphonate	No	TX.
Alkyl imidazoline	No	(²).
Alkyl succinic anhydride	No	SM, TNA.
Alkyl terephthalamate	No	SOC.
Bis(1,3-Dimethylbutyl)phosphorodithioate oleyl amine salt	No	ELC.
Bornyl phenylamine	No	SOC.
DI-2-ethylhexylphosphorodithioic acid	No	ELC.
DI-N-propylphosphorodithioic acid	No	ELC.
Diisopropyl hydrogen phosphite	No	ALW.
Dimer acid esters and polyesters	No	EMR.
Dodecyl succinic acid, benzotriazole salt	No	SM.
Dodecylphenyl- α -naphthylamine	No	SM.
Dodecylphenyl- α -naphthylamine, dioctyl diphenylamine co-polymer	No	SM.
Ethylene-propylene copolymer	No	TX.
Fatty acid polyamine condensate	No	SOC.
Mixed polyesters	No	HCC.
Modified ethylene-propylene copolymers	No	TX.
Pentaerythritol esters	No	HCC.
Polyisobutenyl succinic anhydride	No	TX.
1,3,4-Triadiazole, 2,5-bis(dialkylthio) derivatives	No	ELC.
Tributyl phosphite	No	ALW.
Trimethylol propane ester	No	EMR, HCC, QCP.
Very high molecular weight (>1000) hydrocarbons	No	(²).
Zinc dialkylthiophosphate	No	ELC, SOC, TNA, TX.
Zinc dialkylphenol dithiophosphate	No	SOC.
Zinc dibutyl phosphorodithioate	No	ELC.
Zinc hydrocarbon dithiophosphate	No	(²).
All other phosphorodithioates used as lubricating oil and grease additives	No	ELC, (²).
Succinimides:		
Alkenyl succinimide	No	SOC, TNA, TX, (²).
Dodecyl-acetic succinimide	No	SM.
Sulfur compounds:		
Aliphatic hydrocarbon sulfides	No	ELC, FER, (²).
DI-tertiary nonylpolysulfide	No	PAS.
Trisobutylene polysulfide	No	TX.
All other sulfur compounds	No	FER, QCP, TNA, WBG, (²).
All other lubricating oil and grease additives, acyclic	No	ALW, DUP, ELC, QCP, QCP, SM, TNA, TX, (²), (²), (²).
All other lubricating oil and grease additives, cyclic	No	(CGY, ENJ, SCP, SM, TNA, TX, (²).
Paint driers, naphthenic acid salts:		
Barium naphthenate	No	(²).
Cadmium naphthenate	No	CCA.
Calcium naphthenate	No	CCA, MCI, NOD, TRO.
Chromium naphthenate	No	MCI.
Cobalt naphthenate	Yes	CCA, MCI, NOD, SHP, TRO.
Copper naphthenate	No	NOD.
Iron naphthenate	No	CCA, MCI, NOD.
Lead naphthenate	No	CCA, MCI, NOD, TRO.
Lithium naphthenate	No	CCA.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' Identification codes (according to list in Table 44)
Paint driers, naphthenic acid salts—Continued		
Manganese naphthenate	No	CCA, MCI, NOD.
Naphthenate driers, mixed salts	No	MCI.
Rare earths naphthenate	No	CCA, NOD.
Strontium naphthenate	No	CCA.
Zinc naphthenate	No	CCA, MCI, NOD, TRO.
Photographic chemicals:		
N-2-(4-Amino-N-ethyl-m-toluidino)ethyl methane-sulfonamide	No	WAY.
2-Amino-5-mercapto-1,3,4-thiadiazole	No	CCC.
Aryl alkyl polyether alcohol	No	DIX(E).
5-Chlorobenzotriazole	No	FMT.
4-Diazo-2,5-diethoxymorpholinobenzene	No	ALL.
2,5-Diethoxy-4-morpholinobenzenediazonium chloride ..	No	ALL.
p-Diethylaminobenzenediazonium chloride (p-Diazo-N, N-diethylaniline zinc chloride)	No	ALL, ESA.
p-Dimethylaminobenzenediazonium chloride (p-Diazo-N, N-dimethylaniline zinc chloride)	No	ALL, ESA.
p-[Ethyl(2-hydroxyethyl)amino]benzenediazonium chloride (p-diazo-n-hydroxyethylaniline zinc chloride) ..	No	ALL, ESA.
(N-Ethyl-N-(2-hydroxyethyl)-3-methyldehydrogen sulfate)p-phenylenediamine	No	(²).
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	No	WAY.
Hydroquinone (Hydroquinol)	No	EKT.
4-Hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone	No	(²).
p-Methylaminophenol sulfate (Metol)	No	EK.
5-Methyl-1,7-dihydroxy-1,3,4-triazaindolzine	No	FMT.
3-Methyl-N-[2(methylsulfonamidoethyl)-N-ethyl-p-phenylenediamine]sequisulfate monohydrate	No	(²).
4-Methyl-1-phenyl-3-pyrazolidone	No	CWN.
p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	No	ALL.
5-Nitrobenzimidazole nitrate	No	EK.
Phenyl-5-mercaptotetrazole	No	FMT.
1-Phenyl-3-pyrazolidone	No	CWN.
Poly(vinyl-O-sulfobenzal)	No	DUP.
4-N-(1-Pyrrolidyl)-m-toluenediazonium chloride	No	ALL.
All other photographic chemicals	No	ARN, COC, DUP, ESA, FMT, WAY, (²), (²).
Polymers for fibers:		
Cellulose acetate	No	EKT, HCL, MIL.
Copolyurethane urea	No	DUP.
Linear saturated polyester	No	EKT.
Nylon 6 and 6/6:	Yes	
Nylon 6 (polymer for fiber, only)	No	ACS, SKP, (²).
Nylon 6/6	No	DUP, MON, SKP.
Polyacrylonitrile and acrylonitrile copolymers	Yes	ACY, BKM, DUP, MON.
Polyethylene terephthalate	No	DUP, EKT, FRF, GYR.
Poly-m-phenylene isophthalamide	No	DUP.
Poly-p-phenylene terephthalamide	No	DUP.
All other polymers for fibers	No	HCL, QCP.
Polymers, water soluble:		
Acrylamide polymers and co-polymers:		
Acrylamide-2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	No	ENJ, (²).
Acrylamide-acrylic acid copolymer, potassium salt ...	No	(²).
Acrylamide-acrylic acid copolymer, sodium salt	No	BKM, (²).
Acrylamide N-dimethylaminomethylacrylamide copolymer	No	BKM.
Acrylamide-trimethylaminoethyl acrylate chloride polymer	No	(²).

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 44)
Polymers, water soluble—Continued		
Acrylamide polymers and co-polymers—Continued		
Acrylamide-trimethylaminoethyl methacrylate		
chloride	No	(²).
Adipic acid-crosslinked polycrylamide	No	BKM, ENJ, HCL, (²).
Polyacrylamide	Yes	ACY, DOW, ENJ, MRK, SQA, (²).
All other polyacrylamide copolymers	No	HCL, (²).
Cellulose esters and ethers:		
Hydroxyethylcellulose	Yes	AQU, DOW, UCC.
Hydroxyethyl hydroxypropyl cellulose	No	(²).
2-Hydroxypropyl cellulose	No	AQU.
Methylcellulose	No	DOW, UPJ.
Sodium carboxymethylcellulose (100%)	Yes	AQU, CBC, LCS, MAK.
Sodium carboxymethyl amylose	No	CCL.
Sodium carboxymethyl starch	No	(²).
All other cellulose ethers and esters	No	AQU, S, UCC, (²).
Dimethylamine epichlorohydrin ethylenediamine		
copolymer	No	(²).
Ethyl acrylate methacrylic acid copolymer	No	ALC.
Hydroxypropyl guar gum	No	AQU.
Poly(acrylic acid, ethyl ester)	No	DUP.
Poly(acrylic acid, methyl ester/ethylene/1,1-dichlorosuccinic acid, methylene-) with ethyl acrylate	No	DUP.
Polyacrylic acid salts:		
Ammonium polyacrylate	No	CCL, RH, (²), (²), (²).
Polyacrylate methacrylate copolymers	No	RH, (²).
Polyacrylate poly(hydroxypropylacrylate) copolymer	No	(²).
Polyacrylic acid	No	MYO, (²), (²).
Sodium ammonium polyacrylate and copolymers	Yes	ALC, BAS, BFG, RH, (²), (²).
Sodium polyacrylate	No	BKM, DOW, EFH, MYO, SYT, (²).
All other polyacrylic acid salts	No	ACY, BFG, ENJ, (²), (²), (²).
Polyacrylonitrile, hydrolyzed	No	BKM, DIX(E), RH.
Polyacrylonitrile, starch hydrolyzed polymer	No	GPC.
Polyamines	No	ENJ, (²).
Polydextrose	No	PFZ.
Poly(diallyldimethylammonium chloride)	No	CPS, MRK, (²).
Polymethyleneimine	No	DAN.
Polymethacrylic acid, sodium salt	No	ALC, CPS, PFN.
Poly(1,1'-(methylimino)bis(3-chloro-2-propanol)-tetramethylethylenediamine		
trimethylaminoethyl acrylate chloride polymer	No	BKM.
1-Vinyl-2-pyrrolidone, polymers	No	(²).
Xanthan gum	No	CCL, DAN, GAF, (²).
All other polymers, water soluble	No	PFZ.
		BKM, DAN, EFH, PRA, RH, RPC, SYT, (²), (²), (²), (²).
Poly-α-olefins:		
	Yes	
Poly- α -olefins	No	CO, SM, SOC.
Poly- α -olefins, sulfurized	No	SM.
Rare sugars:		
D-Galactose	No	PFN.
D-Maltose	No	PFN.
Silicone greases:		
Silicone greases	No	DCC, SPD, SWS.
Tanning materials, synthetic:		
	Yes	
1-Naphthalenesulfonic acid, formaldehyde condensate and salt	No	RH.
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	No	GRD.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 44)
Tanning materials, synthetic—Continued	Yes	
1-Phenol-2-sulfonic acid, formaldehyde condensate (Phenol-formaldehyde, sulfonated)	No	BAS, RH.
Polyoxyalkylated cyclic amines	No	MIL.
All other tanning materials, synthetic	No	BAS.
Textile chemicals, other than surface active agents:	Yes	
Dicyanodiamide formaldehyde ammonium chloride polymer	No	CCC, CRT, DAN.
Dimethyloldihydroxyethylene urea	No	ACY, CCC, CHP, DAN, SYT.
Formaldehyde polymer with carbamate esters	No	SYT.
Lauryl alkyl dimethylamine acetate	No	(²).
Lauryl alkyl dimethylamine phosphate	No	(²).
Melamine formaldehyde methanol polymer	No	ACY, CCC, CRT.
Melamine formaldehyde copolymer	No	ENJ.
Melamine stearyl alcohol polymer	No	SYT.
Phenol, sulfurated	No	EMR.
Propoxylated starches	No	SYT.
2,2',4,4'-Tetrahydroxybenzophenone	No	BAS.
Urea polymers with formaldehyde and methanol	Yes	ACY, BAS, CCC, CRT, SYT.
Urea, polymer with tetrakis(hydroxymethyl)phosphonium sulfate	No	CHP.
All other textile chemicals, other than surface active agents	No	BAS, CCL, DUP, ENJ, GAF, JSC, PAT, RPC, S.
Urea in compounds or mixtures (100% basis):		
Urea in feed compounds (100% basis)	Yes	APD, BNP, CAC, EMR, SOH, TER, TRI, WYC.
Urea in liquid fertilizer (100% basis)	Yes	ARM, BNP, CFI, CHN, CNC, FRI, HKY, MSC, SMP, SOC, SOH, TER, TRI, TVA, UOC, (²).
Urea in plastics (100% basis)	No	OMC, SOH, TRI.
Urea in solid fertilizer (100% basis)	Yes	APD, CAC, CFI, CNC, FRI, GCC, MSC, OMC, SOH, TER, TRI, TVA, UOC, WLC, WYC.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 44

Miscellaneous end-use chemicals and chemical products: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ACS	Allied Signal, Inc. Engineered Materials Sector	EK	Eastman Kodak Co.:
ACY	American Cyanamid Co.	EKT	Tennessee Eastman Co. Div.
AJI	Ajinomoto USA, Inc.	ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.
ALC	Alco Chemical Corp.	EMR	Quantum Chemical Corporation, Emery Div.
ALD	Aldrich Chemical Co., Inc.	ENJ	Exxon Chemical Americas
ALL	Alliance Chemical, Inc.	ESA	East Shore Chemical Co.
ALW	Albright & Wilson, Inc.	FER	Ferro Corp.:
ALX	Alox Corp.		Ferro Chemical Div.
AMO	Amoco Corp.		Keil Chemical Div.
APD	Atlas Powder Co. Sub. of Tyler Corp.	FMT	Fairmount Chemical Co., Inc.
AQU	Aqualon	FRF	Firestone Tire & Rubber Co., Firestone Fibers & Textiles Co.
ARM	LaRoche Industries Inc.	FRI	Farmland Industries, Inc.
ARN	Arenol Chemical Corp.	GAF	GAF Corp., Chemical Group
ATR	Atlantic Richfield Co., Arco Chemical Co.	GBF	International Bio-Synthetics, Inc.
BAS	BASF Corp.	GCC	Western Branch Holding Company
BCK	Beckman Instruments, Inc., Diagnostics System Group	GFS	G. Frederick Smith Chemical Co.
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	GNR	Genencor, Inc.
BKM	Buckman Laboratories, Inc.	GPC	Grain Processing Corp.
BLZ	Belzak Corp.	GRD	W. R. Grace & Co., Polymers & Chemical Div.
BNP	Bison Nitrogen Products Co.	GTL	Great Lakes Chemical Corp.
BRD	Lonza, Inc.	GYR	Goodyear Tire & Rubber Co.
BRS	Bristol-Myers Co.	HCC	Hatco Chemical Corp.
CAC	Cominco Fertilizers Inc.	HCL	Hoechst Celanese Corp:
CBC	Carbose Corp.		Hoechst Celanese Fibers.
CCA	Akzo Chemicals, Inc.		Sou-Tex Works.
CCC	C.N.C. International, Inc.	HDG	Hodag Chemical Corp.
CCL	Catawba-Charlab, Inc.	HKY	Hawkeye Chemical Co.
CCW	Morton-Thiokol, Inc., Carstab Div.	HMP	W. R. Grace & Co., Hampshire Chemical Div.
CED	Cedar Chemical Co.	HMY	Humphrey Chemical Co.
CFI	CF Industries, Inc.	HPC	Hercules, Inc.
CGY	Ciba-Geigy Corp.	JFR	George A. Jeffreys & Co., Inc.
CHH	CHR. Hansen's Laboratory, Inc.	JSC	Sybron Chemicals, Inc.
CHN	Wil-Gro Fertilizer, Inc.	LCS	Louisiana Chemical Polymers, Inc.
CHP	C. H. Patrick & Co., Inc.	LEM	Napp Chemicals, Inc.
CHT	Chattem, Inc.	LYP	Lyondell Petrochemical Co.
CNC	Columbla Nitrogen Corp.	MAK	MAK Chemical Corp.
CO	Conoco Specialty Products, Inc.	MCI	Mooney Chemicals, Inc.
COC	Columbla Organic Chemical Co., Inc.	MCK	MacKenzie Chemical Works, Inc.
CPS	CPS Chemical Co., Inc.	MIL	Milliken & Co., Milliken Chemical Div.
CRT	Chemos Corp.	MLS	Miles Laboratories, Inc., Biotechnology Group.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.	MNA	Monsanto Agricultural Co.
CSP	Coastal Refining & Marketing, Inc.	MON	Monsanto Co.
CWN	Upjohn Co., Fine Chemicals	MRK	Merck & Co., Inc.
CXI	Chemical Exchange Industries, Inc.	MSC	Mississippi Chemical Corp.
DAN	Dan River, Inc., Chemical Products Div.	MYO	Mayo Chemical Co.
DCC	Dow Corning Corp.	NBI	Novo Biochemical Industries, Inc.
DGC	Degussa Corp.	NOD	Huls, America, Inc.
DIX	Dixie Chemical Co., Inc.	NSW	NutraSweet Co.
DOW	Dow Chemical Co.	OMC	Olin Corp.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept. ED/IMG Dept. Textile Fibers Dept.		
EFH	E.F. Houghton Co.		

Section 14

Table 44

Miscellaneous end-use chemicals and chemical products: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
PAH	Parlsh Chemical Co.	SOH	BP Chemicals America
PAR	Pennzoll Co., Penreco Div.	SPD	General Electric Co., Silicone Products Dept.
PAS	Pennwalt Corp.	SPR	Scientific Protein Laboratories
PAT	Pat-Chem Inc.	SQA	Segua Chemicals, Inc.
PFN	Pfanstiehl Laboratories, Inc.	SWS	Wacker Silicone
PFZ	Pfizer, Inc.	SYT	Synthron, Inc.
PLC	Pierce Chemical Co.	TER	Terra International, Inc.
PLB	Pharmacia P-L Biochemicals, Inc.	TER	Terra Nitrogen, Inc.
PLC	Phillips 66 Co.	TNA	Ethyl Corp.
PMP	PMP Fermentation Products, Inc.	TPC	Texas Petrochemical Corp.
PRA	Para-Chem Southern	TRI	Triad Chemical
QCP	Quaker Chemical Corp.	TRO	Troy Chemical Corp.
REG	Regis Chemical Co.	TVA	Tennessee Valley Authority
RH	Rohm & Haas Co.	TX	Texaco, Inc., Texaco Chemical Co.
RPC	Colloids, Inc.	UCC	Unlon Carbide Corp.
RSA	R.S.A. Corp.	UOC	Union Oil Co. of California
S	Sandoz, Inc., Colors & Chemicals Div.	UPJ	Upjohn Co.
SCP	Henkel Corp.	UPM	U.O.P. Inc.
SHC	Shell Oil Co., Shell Chemical Co.	USR	Unroyal, Inc., Unroyal Chemical Div.
SHP	Shepherd Chemical Co.	VLR	Valero Refining Company
SHX	Sherex Chemical Co., Inc.	VNC	Vanderbilt Chemical Corp.
SKP	Shakespeare Co., Monofilament Div.	WAY	Olin Hunt Specialty Products, Inc.
SM	Mobil Oil Corp., Mobil Chemical Co., Chemical Products Div.	WBG	White & Bagley Co.
SMP	J. R. Simplot Co.	WLC	Freeport-McMoran Resource Partners
SOC	Chevron Corp., Chevron Chemical Co.	WTC	Witco Chemical Corp.
SOG	Hill Petroleum Company	WYC	Wycon Chemical Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 15

Miscellaneous Cyclic and Acyclic Chemicals

The term "miscellaneous chemicals" as it is used here comprises those synthetic organic products that are not included in the use groups covered by sections I–XIV of this report. They include products that are employed in a great variety of applications. The number of chemicals used extensively for only one purpose is not large. Among the products covered in this section are those used for refrigerants, aerosols, solvents, catalysts, additives in plastics and food products, and, especially, a wide range of acyclic chemical intermediates.

Figure 16 shows the trend of production of miscellaneous chemicals during 1984–88, and shows there has been a steady rate of increase since 1984. However, only the 1988 production of 105.9 billion pounds was higher than the previous all-time peak of 98.8 billion pounds produced in 1979.

U.S. production of miscellaneous cyclic and acyclic chemicals in 1988 amounted to 105.9 billion pounds, an increase of 8.0 percent compared with production in 1987 (Table 45). Production of miscellaneous cyclic chemicals comprised only 3.1 percent of this section's total production.

Because most of the production of miscellaneous chemicals is used internally by their producers to make more advanced intermediates and other chemical products, their sales are much smaller than their production. In 1988, sales of miscellaneous chemicals were 42.2 billion pounds, valued at \$15.1 billion, compared with 40.3 billion pounds, valued at \$12.0 billion, in 1987. The increase in sales quantity in 1988 was 4.7 percent. Moreover, with continuing increases in prices, the value of sales in 1988 was 25.6 percent greater than in 1987.

Oxygenated hydrocarbons accounted for about 61 percent of the production of all acyclic miscellaneous chemicals. Production of oxygenated hydrocarbons, which include organic acids, alcohols (the largest group), ketones, esters, ethers, aldehydes, epoxides, and other chemicals, increased from 58.9 billion pounds in 1987 to 62.4 billion pounds in 1988, or by 5.9 percent.

Slightly larger in volume than the alcohols in miscellaneous acyclic chemicals is the halogenated hydrocarbons group. Production of halogenated hydrocarbons was more than 28 billion pounds in 1988, about 2.5 billion pounds more than in 1987. Production of chlorinated hydrocarbons,

by far the largest segment of this group, was 27.0 billion pounds in 1988, compared with 24.7 billion pounds in 1987. The overall increase in this group in 1987–88 hides larger changes in many of its constituent chemicals: There was increased production of methyl chloride (up 60 percent), carbon tetrachloride (up 13 percent), chloroform (up 13 percent), vinyl chloride (up 8 percent), ethylene dichloride (up 7 percent), perchloroethylene (up 5 percent), and 1,1,1-trichloroethane (up 4 percent). Fluorinated hydrocarbons production was 1.37 billion pounds in 1988, up 18.3 percent compared with production in 1987. Production of the three major chlorofluorocarbons—F-11, F-12, and F-22—was more than 20 percent higher than in 1987. Production of brominated chemicals, on the other hand, dropped in 1988 (as it had in 1987), down 18.6 percent from the previous year.

The second largest individual group of miscellaneous acyclic chemicals is monohydric alcohols (which had double the production of polyhydric alcohols); their production was 16.6 billion pounds in 1988, an increase of 8.5 percent over 1987, which followed a greater increase the year before. The greatest growth in production in 1988 was attained by the butyl alcohols (up 19 percent), 2-ethylhexanol (up 12 percent), and methanol (up 8 percent). Mixtures of alcohols, however, dropped in volume in 1988.

Virtually in a tie for third place among miscellaneous acyclic chemicals, each with production close to 9 billion pounds in 1988, are nitrogenous compounds, acids and anhydrides, and aldehydes. Mainly because of decreases in acetic and acrylic acids, production of acids and anhydrides was 3.8 percent less than in 1987. Production of aldehydes was 3.8 percent greater than in 1987, led by an increase for formaldehyde of 9.6 percent. Production of nitrogenous chemicals was 4.1 percent greater than in 1987. Production of the large "all other" group of nitrogenous chemicals increased by 30 percent in 1988, and that of the amines by 5 percent, but there were small decreases in production of the amides, the ethanalamines, and the nitriles.

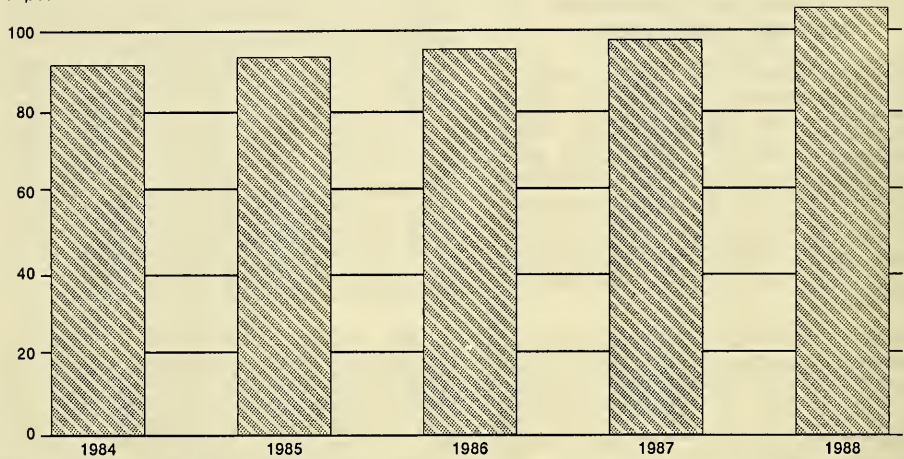
There were a few other large increases in 1988 of major chemicals; namely, the increase of 41.3 percent in production of vinyl acetate to 2.56 billion pounds in 1988, and increases of 24.4 percent for ethylene oxide, 18.9 percent for ethyl acetate, and 6.4 percent for ethylene glycol.

Table 46 lists the products in this section individually identified by manufacturer(s) codes. Table 47 lists those codes alphabetically and identifies the manufacturer by name.

Aimison Jonnard
202-252-1350

Figure 16
Miscellaneous cyclic and acyclic chemicals: U.S. production, 1984-88

Billions
of pounds



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 45

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
		1,000 pounds	1,000 dollars	
Grand total	105,922,869	42,211,980	15,117,535	\$0.36
Cyclic				
Total	3,272,790	1,521,560	1,747,959	1.15
Benzole acid esters, total	3,344	(²)	(²)	(²)
Butyl benzoate	(²)	1,058	783	.74
Benzole acid salts	(²)	25,639	16,440	.64
Benzoyl peroxide	10,253	8,688	20,531	2.36
Caprolactam	1,261,265	367,583	234,495	.64
Cumene hydroperoxide	3,577	3,283	1,819	.55
Hexamethylenetetramine, tech	89,289	(²)	(²)	(²)
Lactones	110,149	21,750	22,854	1.05
Maleic anhydride	448,433	357,897	153,674	.43
Morpholine	(²)	26,358	17,118	.65
Pinene and derivatives, total	345,734	44,491	20,013	.45
β-Pinene	37,880	(²)	(²)	(²)
Pine oil, natural sulfate	5,873	4,689	1,568	.33
All other	301,981	39,802	18,445	.46
Succinic anhydride derivatives	18,986	17,721	16,449	.93
Tall oil salts (Linoleic-rosin acid salts)	1,877	1,422	2,267	1.59
All other miscellaneous cyclic chemicals	979,883	645,670	1,241,516	1.92
Acyclic				
Total	102,650,079	40,690,420	13,369,576	.33
Nitrogenous compounds				
Total	9,146,687	3,367,161	1,723,726	.51
Amides, total				
	286,222	153,630	113,406	.74
N,N'-Ethylenebis-oleamide	442	469	600	1.28
N,N'-Ethylenebis-stearamide	45,187	33,495	22,351	.67
Oleamide (Octadecene amide)	3,704	3,273	3,795	1.16
All other amides	236,889	116,393	86,660	.74
Amines, total³				
	1,829,202	621,515	419,676	.68
Butylamines, total	29,881	24,349	17,819	.73
Ethylenediamine	78,535	62,316	45,508	.73
Isopropylamine, mono-	(²)	57,814	22,467	.39
Dimethylamine	99,270	74,658	24,938	.33
Trimethylamine	42,795	38,535	12,333	.32
All other amines	1,578,721	363,843	296,611	.83
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)				
	(²)	20,884	15,959	.76
Ethanolamines, total	608,233	482,394	189,843	.39
2,2'-Aminodiethanol (Diethanolamine)	190,645	159,872	61,561	.38
2-Aminoethanol (Monoethanolamine)	216,767	146,782	57,309	.39
2,2',2''-Nitrilotriethanol (Triethanolamine)	200,821	175,760	70,973	.40

See footnotes at end of table.

Section 15

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
Nitrogenous compounds—Continued				
Nitriles, total	5,051,605	1,828,094	673,101	\$0.37
Acetonitrile	34,774	(²)	(²)	(²)
Acrylonitrile	2,668,829	1,584,302	588,983	.37
2-Methylacetonitrile (Acetone cyanohydrin)	1,306,448	(²)	(²)	(²)
All other nitriles	1,101,554	243,792	84,118	.34
All other nitrogenous compounds	1,371,425	260,644	311,741	1.20
Acids, acyl halides and anhydrides				
Total	8,953,655	2,358,745	1,015,068	.43
Acetic acid, synthetic, 100% ⁴	3,159,457	783,753	131,912	.17
Acrylic acid ⁴	1,068,834	236,090	113,544	.48
2-Ethylhexanoyl chloride	2,438	(²)	(²)	(²)
Fatty acids, hydrogenated	336,377	279,815	93,178	.33
Fatty acids, non-hydrogenated	(²)	17,811	6,853	.38
Fumaric acid	(²)	31,774	18,002	.57
Neodecanoyl chloride	1,862	(²)	(²)	(²)
Pivaloyl chloride	3,006	(²)	(²)	(²)
All other acids, acyl halides and anhydrides	4,381,681	1,009,502	651,579	.65
Salts of organic acids				
Total	681,472	420,494	261,913	.62
Acetic acid salts, total				
Sodium acetate	49,178	(²)	(²)	(²)
Zinc acetate	441	467	756	1.62
All other acetic acid salts	7,409	21,269	15,978	.75
Calcium neodecanoate	(²)	98	113	1.15
2-Ethylhexanoic acid (α-ethylcaproic acid) salts, total				
Cadmium 2-ethylhexanoate	859	(²)	(²)	(²)
Calcium 2-ethylhexanoate	2,789	2,843	2,483	.87
Cobalt 2-ethylhexanoate	5,280	4,159	8,111	1.95
Lead 2-ethylhexanoate	(²)	789	642	.81
Manganese 2-ethylhexanoate	1,144	1,111	1,037	.93
Zinc 2-ethylhexanoate	1,329	750	874	1.16
Zirconium 2-ethylhexanoate	4,651	3,091	5,205	1.68
All other 2-ethylhexanoic acid (α -ethylcaproic acid) salts	9,811	6,358	8,135	1.28
Lauric acid salts	2,533	(²)	(²)	(²)
Oleic acid salts	208	(²)	(²)	(²)
Potassium oxalate	31	33	96	2.89
Propionic acid salts, total				
Calcium propionate	22,991	(²)	(²)	(²)
All other propionic acid salts	2,414	(²)	(²)	(²)

See footnotes at end of table.

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
		1,000 pounds	1,000 dollars	
Acyclic—Continued				
Salts of organic acids—Continued				
Stearic acid salts, total ⁵	156,819	152,930	105,393	\$0.69
Aluminum stearates, total	4,785	4,730	5,871	1.24
Aluminum tristearate	1,687	1,672	2,420	1.45
All other aluminum stearates	3,098	3,058	3,451	2.71
Barium stearate	2,480	824	737	.89
Calcium stearate	87,943	94,209	53,321	.57
Magnesium stearate	21,116	15,815	12,538	.79
Zinc stearate	36,513	33,891	28,018	.83
All other stearic acid salts	3,982	3,461	4,908	1.42
All other salts of organic acids	413,585	226,596	113,090	.50
Aldehydes				
Total	9,270,472	2,136,235	284,281	.13
n-Butyraldehyde	1,775,674	59,853	11,724	.20
Formaldehyde (37% by weight)	6,280,452	1,691,683	144,046	.09
All other aldehydes	1,214,346	384,699	128,511	.33
Ketones				
Total	3,121,635	2,207,528	535,732	.25
Acetone	2,302,846	1,526,583	241,680	.16
Methyl ethyl ketone (2-Butanone)	482,028	424,337	166,628	.39
4-Methyl-2-pentanone (Methyl isobutyl ketone)	205,312	158,713	59,546	.38
All other ketones	131,449	97,895	67,878	.69
Alcohols, monohydric, unsubstituted				
Total	16,619,662	7,216,217	1,362,975	.19
Alcohols, C₁₁ or lower, unmixed, total				
Butyl alcohols, total	3,256,875	760,208	188,280	.25
n-Butyl alcohol (n-Propylcarbinol) ⁴	1,854,126	576,523	146,453	.25
Isobutyl alcohol (Isopropylcarbinol) ⁴	155,459	107,691	29,525	.27
All other	1,247,290	75,994	12,302	.16
Ethyl alcohol, synthetic ^{4, 6}	561,778	437,697	133,673	.31
2-Ethyl-1-hexanol	743,118	225,010	74,533	.33
Isopropyl alcohol ³	1,388,882	1,111,119	200,799	.18
Methanol, synthetic ³	8,142,388	3,690,341	267,879	.07
Propyl alcohol (Propanol)	215,669	124,218	43,469	.35
All other alcohols, monohydric, unsubstituted	873,901	312,121	131,757	.42
Alcohols, C₁₂ and higher, unmixed, total				
Dodecyl (lauryl) alcohol	(²)	5,280	4,296	.81
1-Hexadecanol (cetyl alcohol)	(²)	16,653	12,397	.74
All other alcohols, C ₁₂ and higher, unmixed	(²)	64,711	42,418	.65
Mixtures of alcohols, total	1,231,333	468,859	263,474	.56
Containing C ₁₂ and higher	618,456	362,504	216,276	.60
Other mixtures of alcohols	612,877	106,355	47,198	.44

See footnotes at end of table.

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
Esters of monohydric alcohols				
Total	6,164,622	2,780,949	1,278,258	\$0.46
Allyl methacrylate	1,804	1,925	3,306	1.72
n-Butyl acetate	192,845	159,827	59,242	.37
Isobutyl acetate	83,419	55,436	17,850	.32
Butyl acrylate	551,536	223,048	118,503	.53
DI-2-ethylhexyl maleate	1,214	(²)	(²)	(²)
Dilauryl-3,3'-thiodipropionate	2,366	2,379	3,951	1.66
Distearyl-3,3'-thiodipropionate	2,939	2,946	4,936	1.68
2-Ethylhexyl acrylate	107,752	62,958	39,324	.62
2-Ethylhexyl chloroformate	5,830	(²)	(²)	(²)
Ethyl acetate (100% basis)	254,348	191,303	59,324	.31
Ethyl acrylate	344,244	157,947	73,061	.46
Fatty acid esters, not included with plasticizers or surface-active agents, total	13,579	10,282	7,035	.68
Myristyl myristate	(²)	115	228	1.97
Tridecyl stearate	1,702	836	579	.69
All other fatty acid ester not included with plasticizers or surface-active agents	11,877	9,331	6,228	.67
Isopropyl chloroformate	2,488	(²)	(²)	(²)
Isopropyl acetate	40,851	(²)	(²)	(²)
Lauryl methacrylate	(²)	1,409	2,218	1.57
Methyl methacrylate ⁴	1,100,271	(²)	(²)	(²)
Phosphorus acid esters, not elsewhere specified	116,163	108,949	120,655	1.11
Triso-octyl phosphite	415	(²)	(²)	(²)
Propyl acetate	70,833	62,118	29,018	.47
Vinyl acetate	2,561,434	1,184,162	439,094	.37
All other esters of monohydric alcohols	710,291	556,260	300,741	.54
Polyhydric alcohols⁷				
Total	7,621,796	5,781,334	2,027,166	.35
1,4-Butanediol	402,286	121,719	69,798	.35
Ethylene glycol ⁴	5,517,250	4,406,675	1,442,933	.33
Pentaerythritol ⁴	122,191	109,759	63,726	.58
Propylene glycol	840,460	742,899	211,715	.28
All other polyhydric alcohols	739,609	400,282	238,994	.60
Polyhydric alcohol esters, total	252,285	240,312	175,190	.73
Polyhydric alcohol ethers				
Total	2,093,801	1,762,551	819,822	.48
2-Butoxyethanol (Ethylene glycol monobutyl ether)	408,102	379,299	140,128	.38
2-(2-Butoxyethoxy)ethanol (Diethylene glycol mono-butyl ether)	73,427	61,232	30,713	.50
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	(²)	6,400	3,092	.48
Diethylene glycol	563,032	464,242	166,318	.36
Dipropylene glycol	78,129	68,107	21,561	.32

See footnotes at end of table.

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
Polyhydric alcohol ethers—Continued				
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	(²)	22,352	10,854	\$0.49
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	36,756	(²)	(²)	(²)
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	35,027	(²)	(²)	(²)
Polyethylene glycol	119,623	111,234	69,204	.62
Polytetramethylene glycol ether	78,050	44,986	66,729	1.48
Triethylene glycol	135,955	160,462	58,962	.37
All other polyhydric alcohols ethers	565,700	444,237	252,261	.57
Brominated, chlorinated, and fluorinated hydrocarbons				
Total	28,340,031	10,567,719	2,743,112	.26
Brominated (including bromochlorinated) hydrocarbons, total				
	8,458	10,452	16,575	1.59
Chlorinated hydrocarbons, total				
	26,957,583	9,426,767	1,873,797	.20
Carbon tetrachloride ⁴	761,365	849,267	129,427	.15
Chlorinated paraffins (C ₁₀ –C ₃₀):				
35%–64% chlorine	79,167	79,017	27,644	.35
65% or more chlorine	(²)	21,033	8,730	.42
Chloroform ⁴	523,637	541,540	99,139	.18
Chloromethane (Methyl chloride) ⁴	597,077	208,687	40,360	.19
Dichloromethane (Methylene chloride) ⁴	504,119	515,718	91,236	.18
Ethyl chloride (Chloroethane) ⁴	151,846	103,476	14,261	.14
Ethylene dichloride (1,2-Dichloroethane) ⁴	13,028,248	1,538,918	165,018	.11
Tetrachloroethylene (Perchloroethylene)	497,683	564,995	111,550	.20
1,1,1-Trichloroethane (Methyl chloroform) ⁴	723,656	725,134	201,093	.28
Vinyl chloride, monomer (Chloroethylene) ⁴	9,057,557	3,951,462	910,800	.23
All other chlorinated hydrocarbons	1,033,228	327,520	74,539	.23
Fluorinated (including other fluorohalogenated) hydrocarbons, total				
	1,373,990	1,130,500	852,740	.76
Chlorodifluoromethane (F22)	332,569	250,569	233,538	.93
Dichlorodifluoromethane (F12)	413,777	420,499	262,430	.62
Trichlorofluoromethane (F11)	249,012	253,119	116,688	.46
All other fluorinated (including other fluorohalogenated) hydrocarbons	378,632	206,313	240,084	1.17
All other miscellaneous acyclic chemicals				
Total	10,242,930	1,714,251	1,119,183	.65
Acyclic peroxides, total				
	101,159	53,647	80,451	1.50
tert-Butyl peroxyvalate	4,823	4,018	9,706	2.42
2-Butanone peroxide (MEK peroxide)	13,896	13,282	24,860	1.87
Di-tert-butyl peroxide	(²)	3,623	6,936	1.91
All other acyclic peroxides	82,440	32,724	38,949	1.19

See footnotes at end of table.

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average
		Quantity	Value	Unit value ¹
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
All other miscellaneous acyclic chemicals—Cont.				
Expoxides, ethers and acetals, total	8,240,377	1,276,700	485,851	\$0.38
Ethylene oxide ⁴	5,952,699	647,723	247,067	.38
Glycidyl ethers, total	7,106	8,383	14,124	1.68
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	813	956	1,523	1.59
All other glycidyl ethers	6,293	7,427	12,601	1.70
All other expoxides, ethers and acetals	2,280,572	620,594	224,660	.36
Fats and oils, chemically modified	34,114	32,526	16,284	.50
Organo-boron compounds	(²)	1,272	2,440	1.92
Organo-aluminum compounds	115,525	39,251	71,726	1.83
Chloropropyltrimethoxysilane	2,525	(²)	(²)	(²)
Silicone fluids	139,857	90,803	177,517	1.95
Organo-tin compounds	(²)	25,359	70,870	2.79
Phosgene (Carbonyl chloride)	949,177	(²)	(²)	(²)
All other miscellaneous acyclic chemicals	660,196	194,693	214,044	1.10
Mixtures not specifically itemized, total	141,031	136,924	23,150	.17
Fatty acid residues	24,015	(²)	(²)	(²)
All other mixtures not specifically itemized ⁹	117,016	(²)	(²)	(²)

¹ Calculated from unrounded figures.² Reported data are accepted in confidence and may not be published, or no data were reported.³ Statistics exclude production and sales of fatty amines. Statistics on fatty amines are included in the section "Surface-Active Agents."⁴ The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resin Materials)*, 1988, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.⁵ Statistics exclude production and sales of potassium and sodium stearates. Statistics on these stearates are included in the section "Surface-Active Agents."⁶ Synthetic ethyl alcohol is conventionally defined as that portion made from ethylene. Bureau of Alcohol, Tobacco, and Firearms statistics give the production from "natural" sources, mainly grain.⁷ Some polyols which are used as intermediates for urethanes have been included in the section "Plastics and Resin Materials."⁸ Products included here are predominately acyclic; however, unspecified amounts of mixtures containing some cyclic chemicals may also be included.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 46

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Cyclic		
6-Acetoxy-2,4-dimethyl-1,3-dioxane	No	GIV.
Alkylphenol formaldehyde condensate, alkoxylated	No	(?).
1-(2-Aminoethyl)piperazine	No	UCC.
1-(2-Aminoethyl)piperazine, technical	No	DOW, TRC.
1-(3-Aminopropyl)morpholine	No	TRC, TX.
Amyl ortho- and para- dimethylaminobenzoates	No	VND.
p-Amylphenol	No	SCN.
Anisaldehyde bisulfite	No	ASL.
Benzene 1,3-dihydroxy-2,4 nitroso	No	REM(E).
Benzenephosphinic acid	No	FER.
Benzene phosphonous dichloride	No	FER.
Benzoic acid esters:	Yes	
Benzolc acid, 2-butoxyethanol ester	No	PCI.
Benzolc acid, C ₁₂ -C ₁₅ ester	No	FTX.
Benzolc acid, isodecyl ester	No	VEL.
2-Butoxyethyl benzoate	No	(?).
Butyl benzoate	Yes	MRF, PCI, UTC.
2-Ethylhexyl benzoate	No	BRI.
Sucrose benzoate	No	VEL.
Benzoic acid salts:	Yes	
Ammonium benzoate	No	WTK.
Barium benzoate	No	FER, WTC.
Potassium benzoate	No	KLM, PFZ.
Sodium benzoate, U.S.P.	No	KLM, PFZ.
Sodium benzoate, tech	No	HCP, JRC, PFZ.
Benzo-triazole, polychlorinated	No	EK.
Benzo-triazole, substituted	No	CGY.
Benzoyl peroxide	Yes	AZT, CAD, NOC, RCI, WTC, WTL.
Benzyl alcohol	No	KLM.
Benzyl chloroformate	No	VCM.
Bis[p-chlorobenzoyl]peroxide	No	CAD.
1,2-Bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamoyl)hydrazine	No	ASL, CGY.
Bis(2,4-dichlorobenzoyl) peroxide	No	CAD.
Bis(a,a-dimethylbenzyl)peroxide	No	WTL.
2,2-Bis(ferrocenyl)propane	No	(?).
2,2-Bis(4-hydroxyphenyl)4-methylpentane	No	ASL.
Bis(perfluoroalkyl)bis(alpha-monochlorohydril)-pyromellitate	No	HCL.
Bis(triphenylsilyl)chromate	No	(?).
Boron fluoride-phenol complex	No	ACS, WTC.
β-Bromo-β-nitrostyrene	No	GIV.
tert-Butylhydroquinone	No	EKT.
Butyl and Isopropyl phthalimides	No	RPC.
2 (and 3)-tert-Butyl-4-methoxyphenol (BHA)	No	EKT, UPM.
Butylmorpholine	No	TX.
tert-Butyl peroxybenzoate	No	AZT, FRE, NOC, WTL.
tert-Butylphenyl glycidyl ether	No	REZ, WLN.
Camphene	No	SCM.
Caprolactam (2-Oxohexanemethylenimine)	Yes	ACS, BAS, CNP.
Caprolactam magnesium bromide	No	(?).
Cellulose acetate hexahydrophthalate	No	(?).
Cellulose acetate phthalate	No	EK.
1-(3-Chloroallyl)-3,5,7-triazo-1-azoniaadamantane chloride	No	DOW.
Chlorophenyl trichlorosilane	No	SCM.
Chlorothioxanthone	No	PSG.
Cinnamionitrile	No	TNA.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Cyclic—Continued		
Cresolsulfonic acid, formaldehyde condensate	No	HCL.
Cresyl glycidyl ether	No	REZ.
Cresyl glycidyl ether	No	TRC, WLN.
Cumene hydroperoxide	Yes	ART, BTL, FRE.
α -Cumyl peroxyneodecanoate	No	WTC, WTL.
Cyanuric acid	No	MON.
Cyclic silizane	No	SCM.
Cyclohexane carbonitrile	No	DUP.
Cyclohexane dimethanol diglycidyl ether	No	WLN.
Cyclohexanethiol	No	PAS.
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl, C ₂₅ H ₃₈ O ₄	No	WVA.
1,4-Cyclohexylenedimethanol	No	EKT.
Cyclohexyl methacrylate	No	CPS.
Decabromodiphenyl ether (DBDP)	No	DOW, GTL, TNA.
Decahydronaphthalene (Decalin)	No	DUP.
4,4-Diaminodiphenyl ether	No	MAL.
1,8-Diazabicyclo (5.4.0)undecane	No	AIP.
1,4-Diazobicyclo(2.2.2)octane	No	(²).
2,5-Di(benzoyl peroxy)-2,5-dimethylhexane	No	AZT, WTL.
Dibutoxy acetophenone	No	CWN.
Di-t-butyl diperoxyphthalate	No	WTL.
2,6-Di-tert-butyl-p-cresol (BHT):		
2,6-Di-tert-butyl-p-cresol, (BHT), food grade	No	USR.
2,6-Di-tert-butyl-p-cresol, (BHT), technical grade	No	UCC, USR.
2,5-Di-tert-butylhydroquinone	No	EKT.
1,1-Di(t-butyl peroxy) cyclohexane	No	WTL.
1,1-Di(t-butyl peroxy)-3,3,5-trimethyl cyclohexane	No	WTL.
2,4-Di-t-4-sec-butylphenol	No	SCN.
1,3-Dichloro-5,5-dimethylhydantoin	No	BRD.
Dicumyl peroxide	No	FRE.
1,1-Dicyclohexane	No	ALD.
Dicyclopentadienylchromium (Chromocene)	No	(²).
3-Diethylamino-6-methyl-7-(2,4-dimethylanilino)fluoran	No	ESA.
N,N'-Diethyl-N,N'-diphenylurea	No	VCM.
Di(2-ethylhexyl)chlorendate	No	VEL.
o,o-Diethyl-o-phenyl phosphorothioate	No	ICI.
1,5-Diethyl-2-thio-4,6-pyrimidinedione	No	TNI.
2,5-Dihydrothiophene-1,1-dioxide (Sulfolene)	No	PLC.
2,4-Dihydroxybenzophenone	No	BAS.
2,2'-Dihydroxy-4,4'-dimethoxybenzophenone	No	BAS.
Dihydroxydimethyl benzophenone	No	CWN.
3,5-Dihydroxy-3,5-dimethyl-1,2-peroxycyclopentane	No	WTL.
Diiodomethyl-p-tolyl sulphone	No	ABB.
Diisopropylbenzene hydroperoxide	No	HPC.
p-Dimethoxybenzene (Dimethyl ether of hydroquinone)	No	ASL.
N,N'-Dimethyl-N,N'-diphenylurea	No	VCM.
Dimethyl-2,6-naphthalene dicarboxylate	No	UTC.
4,4-Dimethyl oxazolidene	No	EFH.
Dimethyl piperazine	No	TX.
Dimorpholine diethyl ether	No	TX.
Di-tert-octyl hydroquinone	No	EKT.
Dioxane (1,4-Diethylene oxide)	No	FER.
1,3-Dioxolane	No	FER.
Di-para-xylene	No	WCC.
1,2-Diphenoxyethane	No	ASL.
Diphenyl-t-butylhexyl phosphite	No	WTC.
Diphenylsodecyl phosphite	No	WTC.
Diphenylisooctyl phosphite	No	WTC.
Dipropylene glycol salicylate	No	SBC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Cyclic—Continued		
4-(Dodecyloxy)-2-hydroxybenzophenone	No	EKT.
Dodecyl pyridinium chloride	No	TLC.
6-Ethoxy-12-dihydro-2,2,4-trimethyl quinoline	No	MNA, MON.
Ethyl-2-cyano-3,3-diphenyl acrylate	No	BAS.
Ethyl cyclohexylamine	No	AIP.
2-Ethylhexyl-2-cyano-3,3-diphenyl acrylate	No	BAS.
2-Ethylhexyl-1-p-dimethylaminobenzoate	No	CWN, VND.
2-Ethylhexyl-p-methoxy cinnamate	No	VND.
Ethylidene norbornene	No	UCC.
4-Ethylmorpholine	No	TX.
N-Ethyl pyrrolidone	No	GAF.
Furan derivatives:		
α-Ethyl furfuryl alcohol	No	TNA.
2-Furaldehyde (Furfural)	No	QKO.
Furoic acid	No	QKO.
Methyl furan	No	QKO.
Methyl tetrahydrofuran (Methyl THF)	No	QKO.
Tetrahydrofurfuryl alcohol	No	QKO.
All other furan derivatives	No	BRD, QKO, TCH.
Glyceryl p-aminobenzoate	No	VND.
Hexabromocyclodecane	No	TNA.
Hexamethylenetetramine, tech	Yes	BOR, HMP, PLS, WCL.
Homomenthyl salicylate	No	WTC.
Hydrindantin	No	PIC.
Hydroquinone, dl(β-hydroxyethyl) ether	No	EKT.
p-Hydroxybenzoic acid, butyl ester	No	KLM.
p-Hydroxybenzoic acid, ethyl ester	No	KLM.
p-Hydroxybenzoic acid, methyl ester	No	KLM, LEM.
p-Hydroxybenzoic acid, propyl ester	No	KLM, LEM.
N-(Hydroxyethyl) piperazine	No	TCH, UCC.
2-Hydroxy-4-methoxybenzophenone	No	BRD, VND.
2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid	No	BAS.
Hydroxymethyl-5,5-hydantoin	No	BRD.
2-Hydroxy-4-N-octoxybenzophenone	No	BAS.
a-D-p-Hydroxyphenylglycine methyl ester K	No	BOC.
1,2,3-Indantrione monohydrate (Nihydrin)	No	PIC.
Isobutyl biphenyl	No	TCC.
Lactones:		
Butyrolactone	No	BAS, GAF.
Caprolactone	No	UCC.
Diketene	No	EKT.
Lanolin acid	No	UCC.
Lanolin alcohol acetate	No	UCC.
Lanolin, hydroxylated	No	UCC.
Lanolin oil	No	UCC.
Lanolin wax	No	UCC.
Maleic anhydride	Yes	AMO, ART, ASH, DKA, MON.
Methoxyethyl morpholine	No	TX.
4-Methoxyphenol	No	ASL, EKT.
p-Methoxytoluene	No	ASL.
Methylaziridine	No	ARS.
Methylbenzene sulfonate	No	EK.
Methyl-p-benzoquinone	No	EK.
2-Methylcyclohexylamine	No	AIP.
3-(N-Methyl-N-cyclohexylamino)-6-methyl-7-anilino fluora	No	GTL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Cyclic—Continued		
Methyl-3,5-di-tert-butyl-γ-hydroxyhydrocinnamate	No	CGY.
4-Methylmorpholine	No	TX.
4-Methylphthalic anhydride	No	ICI.
1-Methyl-2-pyrrolidone, monomer	No	BAS, GAF.
Methyltetrahydrophthalic anhydride	No	DIX(E).
Morpholine	Yes	AIP, BAS, DOW, TX.
Morpholine salt of p-toluene sulfonic acid	No	AMB.
1,2-Naphthoquinone-2-diazide-5-sulfonyl chloride (215-sulfonyl chloride)	No	ASL.
N-Nitrosophenylhydroxylamine salt	No	MAL.
Nonylphenol, alkoxyated/aminated	No	TX.
Nonylphenol glycidyl ether	No	WLN.
Octabromodiphenyl oxide	No	TNA.
Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propanoate	No	CGY, TNA.
Octylmethoxy cinnamate	No	TMH.
Oxalyl bis (benzylidene hydrazide)	No	EKT.
Phenethyl bromide	No	WCC.
Phenol glycidyl ether	No	TRC.
Phenol-sulfonated formaldehyde rosin	No	HCL.
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	No	TCH, UCC.
Phenyl acid phosphate	No	ALW.
Phenyldisodecyl phosphite	No	WTC.
Phenyl glycidyl ether	No	REZ, WLN.
α-D-Phenylglycine methyl ester K.	No	BOC.
1-Phenyl-2-hydroxy-2-methyl-propanone-1	No	CWN.
N-Phenyl-1-naphthylamine	No	UCC.
Phenylpropanolamine	No	ORT.
Phenyl xylyl ethane	No	HCC, TCC.
Phosphonate ester, cyclic	No	ALW.
Phthalic acid, lead salt, (Dibasic)	No	ALI.
Picramic acid, sodium salt	No	SDC.
Pinene and derivatives:	Yes	
Pinane	No	NCI, SCM.
Pinane hydroperoxide	No	SCM.
2-Pinanol (cis and trans)	No	SCM.
α-Pinene	No	ARZ, SCM.
β-Pinene	Yes	ARZ, NCI, SCM.
α-Pinene epoxide	No	SCM.
α-Pine, sulfate	No	VIK.
Pinene, sulfate	No	ARZ, HPC, NCI.
Pinene, wood	No	HPC.
Pine oil, natural, sulfate	Yes	ARZ, NCI, SCM.
Pine oil, synthetic	No	ARZ, SCM.
Poly-4-(2-acryloxyethoxy)-2-hydroxybenzophenone	No	(²).
Polyglycols-toluene diisocyanate reaction product	No	(²).
Propylene glycol dibenzoate	No	VEL.
Propyl gallate	No	EKT.
2,4(1H,3H)Pyrimidinedione	No	SCM.
2-Pyrrolidone-1-ethyl polymer with 1-elcosene	No	GAF.
p-Quinone	No	EKT.
Resorcinol diglycidyl ether	No	WLN.
Resorcinol monobenzoate	No	EKT.
Rosin acid salts:		
All other rosin acid salts	No	GP.
Salicylic acid, ammonium salt	No	WTK.
Salicylic acid magnesium salt	No	KLM, WTK.
Stannous octyl phthalate	No	(²).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Cyclic—Continued		
Styphnic acid, lead salt	No	REM.
Styphnic acid, magnesium salt	No	REM(E).
Styrene oxide	No	UCC.
Succinic anhydride	No	BCC, MIL.
Succinic anhydride derivatives:	Yes	
Dodecylsuccinic anhydride	No	BCC, DIX(E), HMY.
Dodecylsuccinic anhydride	No	MIL.
Iso-Hexadecenyl succinic anhydride	No	DIX(E), HMY.
Iso-octadecenylsuccinic anhydride	No	DIX(E), HMY.
Nonenylsuccinic anhydride	No	HMY.
Octadecenyl succinic anhydride	No	HMY.
Octenylsuccinic anhydride	No	HMY, MIL.
All other succinic anhydride derivatives	No	HMY.
Sulfosalicylic acid	No	SHX.
Tall oil acyl chloride	No	CCC.
Tall oil, chemically modified	No	FOC, WVA, (2), (2).
Tall oil fatty acids, polymerized	No	WVA.
Tall oil monomer	No	WTC.
Tall oil pentaerythritol tallate	No	EFH.
Tall oil salts (Linoleic-rosin acid salts):	Yes	
Calcium manganese tallate	No	MCI, SHP.
Cobalt manganese tallate	No	MCI, SHP.
Cobalt tallate	No	MCI, SHP, (2).
Lead tallate	No	MCI.
Manganese tallate	No	MCI, SHP.
Zinc tallate	No	MCI.
All other tall oil salts, (Linoleic-rosin acid salts)	No	CCA, CIN, GAF, (2).
Tannic acid, N.F	No	MAL.
Terpene hydrocarbons, monocyclic (Solvenol)	No	HPC, NCI, SCM.
Tetrabromobisphenol A	No	GTL, TNA, (2).
1,2,3,4-Tetrahydronaphthalene (Tetralin)	No	DUP.
Tetrahydrothiophene	No	PAS.
Tetrahydrothiophene-1,1-dioxide (Sulfolane)	No	PLC.
Tetrakis [methylene (3,5-di-tert-butyl-4-hydroxyhydrocinnamate)methane]	No	CGY.
Thiodiethylene bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamate)	No	CGY.
Thiophene	No	PAS.
1,3,5-Triazine-(1,3,5(2H,4H,6H))-triethanol	No	(2).
3,4,4'-Trichlorocarbonyl	No	MON.
Trichloromelamine	No	DOW, GFS.
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichlorosocyanuric acid)	No	MON, OMC.
Tri(2,4-ditertiarybutylphenyl) phosphite	No	WTC.
Tri(methoxymethyl) tri(stearoxymethyl) melamine	No	WPG.
Trimethyl-1-cyclohexane	No	ENJ.
3,3,5-Trimethylcyclohexanol (m-Homomenthol)	No	ARS.
3,5,5-Trimethyl-2-cyclohexene-1-one (Isophorone)	No	UCC.
2,4,6-Trinitroresorcinol and lead derivative	No	REM.
Triphenyl phosphite	No	WTC.
Triphenyltin hydroxide	No	(2).
Tris(3,5-di-tert-butyl-γ-hydroxybenzyl)isocyanurate	No	CGY.
1-Vinyl-2-pyrrolidinone—other copolymers	No	GAF.
1-Vinyl-2-pyrrolidinone-methylacrylic acid, dimethylamine ethyl ester, copolymer	No	GAF.
1-Vinyl-2-pyrrolidinone, monomer	No	GAF.
1-Vinyl-2-pyrrolidinone—vinyl acetate copolymer	No	GAF.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Cyclic—Continued		
All other cyclic chemicals	No	AAC, ALW, ASL, BAS, COC, CWN, EK, EKT, HCL, HK, ML, PAC, PAH, PIC, REG, REM, REZ, RH, RSA, S, SCM, SHP, TNA, TRC, UCC, WLN, WTC, WTL, (2), (2).
Acyclic		
Nitrogenous compounds:		
Acetaldehyde dimethylhydrazone	No	DIX(E).
Adipic acid-diethylene triamine condensate	No	EFH.
Amides:		
Acetamide	No	WTK.
Acrylamide monomer	No	ACY, BFG, COS.
Amidoamines	No	PAC.
Amido amine salts as curing agents	No	(2).
1,1'-Azobisformamide	No	FMT, USR.
Behenamidine	No	WTC.
Bis[2-(octadecylamido)ethyl]-N-(2-cyanoethyl)-N-ethyl ammonium ethyl sulfate	No	SBC.
Chloromethylene dimethyliminium (Amide chloride)	No	CWN.
Coconut oil amide	No	CAD, FER.
2-Cyanoacetamide	No	TLI.
N,N-Diethyldodecanamide	No	EK.
N,N-Dimethylacetamide	No	DUP, MON.
N,N-Dimethylacetoacetamide	No	BRD, EKT.
Dimethylaminopropyl methacrylamide	No	TX.
N,N-Dimethylformamide	No	AIP, DUP, SYP.
Dimethyl oleamide	No	HAL.
Erucamide	No	ARC, WTC.
Erucyl stearamide	No	WTC.
N,N'-Ethylenebis-oleamide (Oleic acid-ethylenediamine condensate (Amlne/acid ratio = 1/2))	Yes	BRD, CCW, WTC.
N,N'-Ethylenebis(stearamide)	Yes	BRD, CCW, WTC.
Fatty acid amide mixtures	No	GAF.
N-(Hydroxymethyl)-formamide	No	(2).
Methacrylamide	No	BFG, DUP.
Monomethylacetoacetamide	No	EKT.
Oleamide (Octadecene amide)	Yes	ARC, SYP, WTC.
Oleoylpalmitamide	No	HXL, WTC.
Oxamide	No	HML, (2).
Stearamide (Octadecane amide)	No	SYP, WTC.
Stearyl erucamide	No	HXL, WTC.
Stearyl stearamide	No	WTC.
Tallow amide, hydrogenated	No	ARC, CAD.
All other amides	No	ARC, ARS, EK, HAL, PAH, REG, WTC.
Amines:		
t-Alkylamines, primary, mixed	No	RH.
Allylamines:		
Allylamines	No	HCL.
Diallylamine	No	HCL.
Triallylamine	No	HCL.
Bis-hexamethylenetriamine amine	No	DUP, MON.
Butylamines:		
n-Butylamine, mono	No	AIP, PAS.
sec-Butylamine, mono	No	FER, PAS.
tert-Butylamine, mono	No	MON, SC.
DI-n-Butylamine	No	AIP, PAS.
Diisobutylamine	No	AIP, HCL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amines—Continued		
Butylamines—Continued		
Tri-n-butylamine	No	AIP, PAS.
n-Butylethylamine	No	AIP.
Carbamate 82M	No	AIP.
Di-tert-butylethyldiamine	No	HCL.
Diethylenetriamine	No	DOW, TX, UCC.
Diisopropylamine	No	AIP, PAS, UCC.
Dimethylaminopropylamine	No	AIP, BAS, TX.
N,N-Dimethylbutylamine	No	HCL.
Ethylamines:		
Diethylamine	No	AIP, HCL, PAS, UCC.
Ethylamine, mono-	No	AIP, HCL, PAS, PLC, UCC.
Triethylamine	No	AIP, PAS, UCC.
Ethylenediamine	Yes	DOW, TX, UCC.
2-Ethylhexylamine, mono-	No	PAS.
N-Ethyl-2-methylallylamine	No	HCL.
Fatty amines	No	NCL.
1,6-Hexanediamine (Hexamethylenediamine)	No	DUP, MON.
n-Hexylamine	No	CXI, PAS.
Isopropylamines:		
Isopropylamine, mono	Yes	AIP, HCL, PAS, UCC.
Methylamines:		
Dimethylamine	Yes	AIP, DUP, GAF, IMC, UCC, (2).
Methylamine, mono-	No	AIP, DUP, GAF, IMC.
Trimethyl amine	Yes	AIP, DUP, GAF, IMC.
tert-Octylamine	No	RH.
Pentaethylenhexamine	No	DOW, UCC.
Pentylamines (Amylamines):		
Dipentylamine	No	HCL, PAS.
Pentylamine, mono-	No	PAS.
Tripentylamine	No	PAS.
Poly(cxypropylene)diamine	No	TX.
Propylamines:		
Dipropylamine	No	AIP, HCL, PAS.
Propylamine, mono-	No	AIP, PAS.
Tripropylamine	No	AIP, PAS.
Tetraethylenepentamine	No	DOW, UCC.
N,N,N',N'-Tetramethyl-1,3-butanediamine	No	MON, UCC.
Tetramethylethylenediamine	No	BKM.
Triethylenediamine	No	TX.
Triethylenetetramine	No	DOW, TRC, UCC.
All other amines	No	ARC, EK, MON, PAC, REG, TRC, UCC, (2).
Other amine—function chemicals:		
Alkyl C ₁₂ -C ₁₄ amine hydrochloride	No	COS.
2-Aminoethanol hydrochloride	No	OMC, (2).
2-Aminoethanol (Monoethanol amine) sulfite	No	EVN.
Aminoethoxyethanol	No	TX.
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	No	DOW, UCC.
(2-Aminoethyl)amino]ethanol, reaction product with octadecanoic acid	No	BRI.
2-Aminoethyl mercaptoacetate (Monoethanolamine thiolglycolate)	No	EVN.
2-Amino-2-ethyl-1,3-propanediol	No	ANG.
Aminoguanidine hydrochloride	No	REM(E).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amines—Continued		
Other amine-function chemicals—Continued		
2-Amino-2-(hydroxymethyl)-1,3-propanediol	No	ANG, WTK.
[Tris(hydroxymethyl)aminomethane]	No	ANG.
2-Amino-2-methyl-1,3-propanediol	No	ANG.
2-Amino-2-methyl-1-propanol	No	TX.
Bis(dimethylaminoethyl) ether	No	AAC, CPS.
tert-Butylaminoethyl methacrylate	No	PAS, UCC.
tert-Butyldiethanolamine	No	UCC.
tert-Butyl ethanolamine	No	ADC, PAS.
tert-Butyl urea	No	
2-Chloro-N,N-dimethylethylamine (Dimethylamino ethyl chloride) hydrochloride	No	SOM.
Choline	No	RH.
Diallyldimethyl ammonium chloride	No	CPS, (2).
Di-amine derivatives of dimer acids	No	TRC, WTC.
2-Dibutylaminoethanol	No	PAS.
Dibutylaminomethanol	No	(2).
2-Diethylaminoethanol (N,N-Diethylethanolamine)	No	PAS, UCC.
2-(2-Diethylaminoethoxy) ethanol	No	PAS, UCC.
2-Diethylaminoethyl acrylate	No	CPS.
Diethylaminoethylacrylate, dimethyl sulfate, quaternary salt	No	CPS.
2-Diethylaminoethyl methacrylate	No	CPS, DUP.
Diethylcarbonyl chloride	No	GAF.
Diethylglycol amine (DEGA)	No	AIP.
Diethylhydroxylamine	No	PAS.
1,3-Diethyl-2-thiourea	No	PAS.
2-Diisopropylaminoethanol (N,N-Diisopropylethanol-amine)	No	PAS, UCC.
2-Diisopropylaminoethyl methacrylate	No	DUP.
Dimethylamine epichlorohydrin copolymer	No	CPS.
2-Dimethylaminoethanethiol hydrochloride	No	EVN.
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	Yes	AIP, PAS, PEL, TX, UCC.
Dimethylaminoethyl acrylate, dimethyl sulfate, quaternary salt	No	CPS.
Dimethylaminoethylacrylate, methyl chloride, quaternary salt	No	CPS.
Dimethylaminoethyl methacrylate	No	AAC, CPS.
Dimethylaminoethylmethacrylate, dimethyl sulfate, quaternary salt	No	AAC, CPS.
Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	No	AAC, CPS.
Dimethylaminomethanol	No	(2).
2-Dimethylamino-2-methyl-1-propanol hydrochloride	No	WPG.
1-(Dimethylamino)-2-propanol	No	PAS, PEL.
Dimethylaminopropylamine, propoxylated	No	TX.
2,5-Dithioblurea	No	GAF.
Ethanolamines:	Yes	
Diethanolamine	Yes	CNE, DOW, OMC, TX, UCC.
Monoethanolamine	Yes	CNE, DOW, OMC, TX, UCC.
Triethanolamine	Yes	CNE, DOW, OMC, TX, UCC.
2-Ethylaminoethanol (Ethylmonoethanolamine)	No	PAS.
1,1-Ethylenediurea	No	EK.
5-(N-Ethyl-N-hydroxyethylamino)-2-pentanone	No	SDW.
2-Ethyl-2-nitro-1,3-propanediol	No	SDW.
Fatty acid, alkanolamine ester	No	(2).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amines—Continued		
Other amine-function chemicals—Continued		
Guanidine hydrochloride	No	EK.
Hexamethylenediamine adipate (Nylon salt)	No	DUP, MON, (2).
Hexamethylene-1,6-diisocyanate (HDI)	No	MOB.
Hexamethylene-a,6-diisocyanate, biurets (HDI-biurets)	No	MOB.
Hexamethylene-1,6-diisocyanate trimers (HDI trimers)	No	MOB.
Hexylamine ethoxylate	No	CXI.
N-(2-Hydroxyethyl)-12-hydroxystearamide	No	CAS.
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tris-(hydroxymethyl)nitromethane)	No	ANG.
Iminodiacetic acid	No	HMP, (2).
Isopropanolamines:		
Dilsoopropanolamine	No	DOW.
Dimethyl isopropanolamine	No	PEL.
Monoisopropanolamine	No	DOW.
Trisopropanolamine	No	DOW.
2-Isopropylaminoethanol	No	PAS, UCC.
Ketimine, tetrafunctional	No	PAC.
3-Methoxypropylamine	No	BAS, TX.
2-Methylaminoethanol (N-Methylethanolamine)	No	PAS, UCC.
Methyl hydrazine, mono	No	OMC, UCC.
2,2'-(Methylimino)diethanol (Methyldiethanolamine)	No	DOW, PAS, TX.
2-Methyl-2-nitro-1-propanol	No	ANG.
Mixed higher glycol amine (MHGA)	No	AIP.
Nitrated lard oil	No	SM.
Nitriles:		
Acetonitrile	Yes	BKC, DUP, SOH, (2).
Acrylonitrile, monomer	Yes	AAC, ACY, BFG, DUP, MON, SC, SOH.
Adiponitrile	No	DUP, MON.
Aminodimethyl butyronitrile	No	NOD.
2,2-Azobis(dimethyl pentane nitrile)	No	DUP.
2,2-Azobis[2-methyl butane nitrile]	No	DUP.
2,2'-Azobis[2-methylpropionitrile] (Azobisisobutyronitrile)	No	DUP.
n-Butyronitrile	No	EKX.
Cyanoacetic acid (Malonic nitrile)	No	NOD.
1-(2-Cyanoethyl)ethyl urea	No	GAF.
3-Ethoxypropionitrile	No	DIX.
Ethyl cyanoacetate	No	NOD.
Isobutyronitrile	No	EKX.
3-Methoxypropionitrile	No	(2).
Methyl cyanoacetate	No	NOD.
4-Methyl-5-hydroxymethyl imidazole	No	SK.
2-Methylactonitrile (Acetone cyanohydrin)	Yes	CYR, DUP, RH, SOH.
Propionitrile	No	MON.
Stearonitrile (Octadecane nitrile)	No	SHX.
Tallow nitrile	No	SHX.
3,3'-Thiodipropionitrile	No	EVN.
Trichloroacetonitrile	No	OMC.
All other nitriles	No	COC, EK, EKT, HXL.
Nitroethane	No	ANG, GON.
Nitromethane	No	ANG, GON.
1-Nitropropane	No	ANG, GON.
2-Nitropropane	No	ANG, GON.
N-n-Octyl glucamine	No	(2).
Semicarbazide hydrochloride	No	OMC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Stearylamidopropyl dimethylamine lactate	No	WM.
Tetraethyl ammonium bromide	No	RSA.
Thiosemicarbazide	No	FMT.
Triethylenetetramine, propoxylated	No	HXL.
Trimethylamine hydrochloride	No	RSA, (²).
All other nitrogenous compounds, acyclic	No	ADC, ARC, ASL, HCL, OMC, REG, RSA, TX, UCC, (²), (²), (²).
Acids, acid anhydrides, and acyl halides:		
Acetic acid, synthetic (100%)	Yes	AIP, BCP, EKT, HCL, MON, SC, UCC, USI.
Acetic anhydride, 100%:		
Acetic anhydride from acetic acid, other than recovered, by the vapor-phase process (100%)	No	EKT, UCC.
Acetic anhydride from acetic acid, recovered, by vapor-phase process	No	PFZ.
Acetyl chloride	No	WCC.
Acrylic acid	Yes	BAS, HCL, RH, UCC.
Adipic acid	No	BFG, DUP, MON.
Anhydride-acid mixture	No	HCL.
2,2-Bis(Hydroxy-methyl)-propionic acid	No	IMC.
Bromoacetic acid	No	WCC.
Bromobutyric acid	No	EKT, GTL.
2-Bromohexanoic acid	No	EKT.
Butyric acid	No	EKT, HCL.
Butyric anhydride	No	EKT.
Butyryl chloride	No	WCC.
Castor oil fatty acids, dehydrated	No	CAS.
Chloroacetic acid, mono	No	PFZ.
Citric acid	No	MLS, PFZ.
Cocoyl chloride	No	WCC.
Crotonic acid (2-Butenoic acid)	No	EKT.
Decanoyl chloride	No	WTL.
2,2-Dichloroacetyl chloride	No	RDA.
Dimer acid (C ₃₆ Aliphatic dibasic acid)	No	SYL, WTC.
Dithiodiglycolic acid	No	EVN.
Dithiodipropionic acid	No	EVN.
Dodecanedioic acid	No	DUP.
2-Ethylhexanoic acid (α -Ethylcaproic acid)	No	EKT, UCC.
2-Ethylhexanoyl chloride	Yes	PPG, WTC, WTL.
Fatty acids, hydrogenated	Yes	ARC, BRD, DRL, SHX, SYP, WTC.
Fatty acids, mixed chain length, synthetic	No	SYP.
Fatty acids, non-hydrogenated	Yes	ARC, BRD, CAS, DRL, WTC.
Fatty acids, partially hydrogenated	No	WTC.
Fumaric acid	Yes	DKA, MON, PFZ.
Gluconic acid, technical	No	PFZ, PMP.
Glutaric acid	No	EK.
Glycolic acid (Hydroxyacetic acid)	No	DUP.
Heptanoic acid	No	ENJ, HCL.
Isoscorbic acid (Erythorbic acid)	No	PFZ.
Isobutyric acid	No	EKX.
Isobutyric anhydride	No	EKT, FER.
Isononanoyl chloride	No	HCL.
Iso-octadecenoic acid	No	SYL.
Itaconic acid (Methylenesuccinic acid)	No	PFZ.
Lactic acid	No	SC.
Lauroyl chloride	No	WTL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Acids, acid anhydrides, and acyl halides—Continued		
Malic acid	No	DKA.
Mercaptoacetic acid (Thioglycolic acid)	No	ELC, EVN.
3-Mercaptopropionic acid	No	EVN, WTC.
Mercaptosuccinic acid (Thiomalic acid)	No	EVN.
Methacrylic acid	No	DUP, RH.
Methanesulfonic acid	No	PAS.
Methanesulfonyl chloride	No	PAS.
Neo-C ₃ -C ₁₂ acids	No	ENJ.
Neodecanic acid	No	ENJ.
Neodecanoyl chloride	Yes	PPG, WTC, WTL
Neoheptanoyl chloride	No	WTC.
Nonanoic acid (Pelargonic acid)	No	EMR, HCL.
Nonanoyl chloride	No	WCC.
Octanoyl chloride	No	WCC, WTL.
Oleic acid	No	DRL, WTC.
Oxidized Fischer-Tropsch wax	No	ENJ, SQA.
Palmitoyl chloride	No	HCL.
Pivaloyl chloride	Yes	PPG, WCC, WTC, WTL.
Polyacrylic acid	No	BFG, BKM, RH.
Polyisopropenylphosphinic acid	No	NES.
Propionic acid	No	EKT, HCL, UCC.
Propionic anhydride	No	EKT.
Propionyl chloride	No	WCC.
Sebacic acid	No	WTH.
Sebacoyl chloride	No	ALD, EK.
3,3'-Thiodipropionic acid	No	EVN.
Thiodisuccinic acid	No	EVN.
Thiolactic acid	No	EVN.
Trichloroacetic acid	No	MNA.
Trifluoroacetic acid	No	HCC.
Trifluoroacetic anhydride	No	HCC.
Trifluoroacetyl chloride	No	HCC.
Trimer dibasic acids	No	WTC.
Valeric acid	No	UCC.
Valeroyl chloride	No	WCC.
All other acids, acid anhydrides, and acyl halides	No	ARC, COC, DUP, EK, ENJ, HMY, HOC, PAH, PG, UCC.
Salts of organic acids:		
Acetic acid salts:	Yes	
Aluminum acetate	No	HCP, JRC, NCC.
Ammonium acetate	No	BKC, WTK.
Barium acetate	No	BKC.
Calcium acetate	No	HFT, NCC.
Chromium acetate	No	SHP.
Cobalt acetate	No	SHP.
Cobalt manganese acetate	No	SHP.
Copper acetate	No	BKC.
Hydrazine acetate	No	FMT.
Lead acetate	No	BKC.
Lead subacetate	No	BKC.
Magnesium acetate	No	BKC, SHP.
Manganese acetate	No	SHP.
Nickel acetate	No	SHP.
Potassium acetate	No	BKC, HCP, JRC, NCC, PEL.
Sodium acetate	Yes	ATL, BKC, BRI, DAN, HCP, JRC, MAL, NCC, UCC, (2).
Sodium diacetate	No	HCP, JRC, NCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Salts of organic acids—Continued		
Acetic acid salts—Continued		
Zinc acetate	Yes	BKC, CCC, DIX, SHP, WTK.
Zirconium acetate	No	CCC, TZC.
Adipic acid, ammonium salt	No	ACS.
Adipic acid, sodium salt	No	QCP.
Adipic dihydrazide	No	FMT.
3-Allyloxy-2-hydroxypropane sulfonic acid, sodium salt	No	(²).
1,2,4-Butanetricarboxylic acid, 2-phosphono, sodium salt	No	BRI.
Citric acid salts:		
Ammonium citrate	No	PFZ.
Calcium citrate	No	PFZ.
Potassium citrate	No	HXL, MLS, PFZ.
Sodium citrate	No	BRI, CIN, HXL, MLS, PCI, PFZ, (²).
Zinc citrate	No	WTK.
All other citric acid salts	No	(²).
Diammonium dithiodiglycolate	No	EVN.
2-Ethylhexanoic acid (alpha-ethylcaproic acid) salts:		
Aluminum 2-ethylhexanoate	No	NOC.
Barium 2-ethylhexanoate	No	NOD, WTC.
Bismuth 2-ethylhexanoate	No	SHP.
Cadmium 2-ethylhexanoate	Yes	CCA, FER, WTC.
Calcium 2-ethylhexanoate	Yes	CCA, FER, MCI, NOD, TRO, WTC.
Cerium 2-ethylhexanoate	No	SHP.
Chromium 2-ethylhexanoate	No	MCI, SHP.
Cobalt 2-ethylhexanoate	Yes	CCA, MCI, NOD, SHP, TRO.
Cobalt-potassium 2-ethylhexanoate	No	MCI.
Copper 2-ethylhexanoate	No	MCI, NOD.
Iron 2-ethylhexanoate	No	CCA, NOD.
Lead 2-ethylhexanoate	No	CCA, NOD, SHP, TRO.
Manganese 2-ethylhexanoate	Yes	CCA, MCI, NOD, SHP, TRO.
Nickel 2-ethylhexanoate	No	MCI, SHP.
Potassium 2-ethylhexanoate	No	CCA, MCI, PEL.
Rare earths 2-ethylhexanoate	No	CCA, MCI.
Sodium 2-ethylhexanoate	No	LIL.
Stannous 2-ethylhexanoate	No	FER.
Zinc 2-ethylhexanoate	Yes	CCA, FER, MCI, NOD, OMC, SHP, TRO, VNC, WTC.
Zirconium 2-ethylhexanoate	Yes	CCA, MCI, NOD, TRO.
All other 2-ethylhexanoic acid salts	No	NOD, SHP.
Fish oil, C ₁₄ -C ₂₂ menhaden, lead salts	No	ELC.
Formic acid salts:		
Ammonium formate	No	RSA, WTK.
Calcium formate	No	IMC.
Potassium formate	No	HCP, JRC.
Sodium formate, technical	No	BKC, PST.
Fumaric acid, lead salt	No	ALI.
Gluconic acid salts:		
Sodium gluconate	No	PFZ, PMP.
Glycolic acid, potassium salt	No	HCP, JRC.
Glycolic acid, sodium salt	No	BRI, HCP, JRC.
Isoscorbic acid, sodium salt (Sodium erythorbate)	No	PFZ.
Tertiary-alpha-alkylcarboxylic acid salts (Isocarboxylic acid salts):		
Calcium t-alpha-alkylcarboxylate	No	MCI.
Cobalt t-alpha-alkylcarboxylate	No	MCI.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Salts of organic acids—Continued		
Tertiary- α -alkylcarboxylic acid salts (Isocarboxylic acid salts)—Continued		
Copper t- α -alkylcarboxylate	No	MCI.
Iron t- α -alkylcarboxylate	No	MCI.
Lead t- α -alkylcarboxylate	No	MCI.
Manganese t- α -alkylcarboxylate	No	MCI.
Mixed t- α -alkylcarboxylic acid salts	No	MCI.
Zinc t- α -alkylcarboxylate	No	MCI.
Zirconium t- α -alkylcarboxylate	No	MCI.
All other t- α -alkylcarboxylic acid salts (Isocarboxylic acid salts)	No	MCI.
Isooctanoic acid salts:		
Isooctanoic acid, lead salt	No	CCA.
Isooctanoic acid, manganese salt	No	CCA.
Isooctanoic acid, calcium salt	No	CCA.
Lactic acid salts:		
Ammonium lactate	No	WM.
Sodium lactate (Nalac)	No	PFN.
Lauric acid salts: Yes		
Barium cadmium laurate	No	FER; WTC.
Barium laurate	No	SYP.
Cadmium laurate	No	SYP.
Dibutyltin dilaurate	No	WTC, (2).
Lauric acid, zinc salt	No	SYP.
Tin laurate	No	FER.
Linoleic acid salts:		
Calcium linoleate	No	CCA.
Maleic acid salts:		
Dibutyltin maleate	No	WTC.
Tribasic lead maleate	No	ALI.
Mercaptoacetic acid (Thioglycolic acid) salts:		
Ammonium mercaptoacetate	No	EVN, WTC.
Calcium mercaptoacetate	No	EVN.
Sodium mercaptoacetate	No	EVN, (2).
All other mercaptoacetic acid (Thioglycolic acid) salts	No	CCA.
Neodecanoic acid salts:		
Bismuth neodecanoate	No	COS, SHP.
Calcium neodecanoate	Yes	CCA, FER, MCI, SHP.
Cobalt neodecanoate	No	MCI, SHP.
Lead-cobalt neodecanoate	No	MCI.
Lead neodecanoate	No	MCI.
Lithium neodecanoate	No	MCI.
Manganese neodecanoate	No	MCI, SHP.
Rare earths neodecanoate	No	MCI.
Zinc neodecanoate	No	SHP.
Zirconium neodecanoate	No	MCI, SHP.
Octanoic-acid (caprylic acid) salts:		
Aluminum octanoate	No	SYP, WTC.
Oleic acid salts: Yes		
Calcium oleate	No	(2).
Copper oleate	No	MCI.
Sodium oleate	No	WTC.
Oxalic acid salts:		
Ammonium oxalate	No	BKC, HML, WTK.
Potassium oxalate	Yes	BKC, HML, WTK.
Sodium oxalate	No	BKC, HML, WTK.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Salts of organic acids—Continued		
Pelargonic acid, calcium salt (Calcium nonoate)	No	SYP.
Phosphorodithioic acid salts (dithiophosphates):		
Potassium dihexyl phosphorodithioate	No	ACY.
Sodium di- <i>sec</i> -butyl/diethyl phosphorodithioate	No	ACY.
Sodium di- <i>sec</i> -butyl phosphorodithioate	No	ACY, ELC.
Sodium diethyl phosphorodithioate	No	ACY.
Sodium dihexyl phosphorodithioate	No	ACY.
Sodium diisobutyl phosphorodithioate	No	ELC.
Sodium diisopropyl phosphorodithioate	No	ACY.
Propionic acid salts:		
Calcium propionate	Yes	HFT, KMI, NCC.
Sodium propionate	No	HFT, NCC.
All other propionic acid salts	No	MCK.
Ricinoleic acid salts:		
All other ricinoleic acid salts	No	CAS.
Sodium- <i>N</i> -methyl- <i>N</i> -oleyl taurate	No	WPG.
Sodium d1-2-sulfosuccinate	No	WPG.
Stearic acid salts:		
Aluminum stearates:		
Aluminum distearate	No	MAL, NOC, NOD, SYP.
Aluminum monostearate	No	MAL, NOD, SYP.
Aluminum tristearate	Yes	MAL, NOC, NOD, SYP, WTC, (2).
Ammonium stearate	No	WPG.
Barium stearate	Yes	ALI, NOC, NOD, SYP, WTC.
Cadmium stearate	No	SYP, VNC, WTC.
Calcium stearate	Yes	ALI, FER, MAL, NOC, NOD, SQA, SYP, WTC.
Cobalt stearate	No	MCI, SHP.
Lead stearate	No	ALI.
Lead stearate, dibasic	No	ALI.
Lithium stearate	No	NOC, WTC.
Magnesium stearate	Yes	ALI, MAL, NOC, NOD, SYP, WTC.
Potassium stearate	No	WTC.
Sodium stearate	No	WTC.
Strontium stearate	No	WTC.
Zinc stearate	Yes	CCC, MAL, NOC, NOD, PLS, SYP, WTC.
Tartaric acid salts:		
Potassium sodium tartrate	No	PFZ.
Sodium bitartrate	No	EKX.
All other tartaric acid salts	No	RSA.
Thioacetic acid, potassium salt		
All other salts of organic acids	No	RSA.
Aldehydes:		
Acetaldehyde	No	EKX, HCL, UCC.
Acrolein (Acrylaldehyde)	No	UCC.
Butyraldehyde	Yes	BAS, EKX, HCL, UCC.
Crotonaldehyde	No	EKT.
2-Ethylhexanal (α -Ethylcaproaldehyde)	No	EKX, HCL, UCC.
Formaldehyde (37% HCHO by weight)	Yes	BOR, CBD, DGC, DUP, GAF, GP, HCL, HPC, IMC, MON, WCL.
Glutaraldehyde	No	UCC.
Glyoxal	No	ACY.
Isobutyraldehyde	No	BAS, HCL, TU, UCC.
Propionaldehyde	No	EKX, HCL, UCC.
Valeraldehyde (Pentanal)	No	UCC.
All other aldehydes, acyclic	No	UCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Ketones:		
Acetone	Yes	ACS, ART, ATR, BTL, DOW, ENJ, GE, GGC, SHC, SKO, UCC.
5-Chloro-2-pentanone	No	SDW.
1-Chloropinacolone	No	CHG.
Chloro-2-propanone (Chloroacetone)	No	MRK.
Diisopropyl ketone (2,4-Dimethyl-3-pentanone)	No	EKK.
2-Heptanone (Methyl amyl ketone)	No	EKT.
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	No	HCL, SHC, UCC.
Isovalerone (Diisobutyl ketone)	No	EKT, UCC.
Methyl ethyl ketone	Yes	ATR, ENJ, LYP, SHC, UCC.
5-Methyl-2-hexanone (Methyl isoamyl ketone)	No	EKT.
Methylhexyl ketone	No	UPM.
Methyl isobutyl ketone	Yes	EKT, EKK, ENJ, SHC, UCC.
4-Methyl-3-penten-2-one (Mesityl oxide)	No	UCC.
Methylpseudonone	No	NCL.
2-Octanone (Hexyl methyl ketone)	No	WTH.
2,4-Pentanedione (Acetylacetone)	No	UCC.
3-Pentanone (Diethyl ketone)	No	EKT, ORT, UCC.
Pseudonone	No	NCL, SCM.
2,6,8-Trimethyl-4-nonanone (Isobutyl heptyl ketone) ..	No	UCC.
All other ketones	No	COC, EK.
Alcohols, monohydric, unsubstituted:		
Alcohols, C ₁₁ or lower, unmixed (95% or more pure):	Yes	
Allyl alcohol	No	FMC.
Amyl alcohols:		
Amyl alcohol, primary	No	UCC.
2-Methyl-1-butanol	No	CPS, UCC.
1-Pentanol	No	UCC.
Butyl alcohols:		
n-Butyl alcohol (n-Propylcarbinol)	Yes	BAS, CXI, EKK, GAF, HCL, SHC, UCC, VST.
sec-Butyl alcohol (Methylethylcarbinol)	No	ENJ, GAF, SHC.
tert-Butyl alcohol (Trimethylcarbinol)	No	ATR, CXI.
Isobutyl alcohol (Isopropylcarbinol)	Yes	ART, BAS, CPS, EKK, HCL, SHC, UCC.
1-Decanol	No	TNA, VST.
Diisobutyl alcohol	No	UCC.
2,2-Dimethylbutanol (Isohexyl alcohol)	No	ENJ.
1-Docosanol (Behenyl alcohol, C ₂₂)	No	SHX.
Ethyl alcohol, synthetic	Yes	DOW, EKK, UCC, USI, VST.
2-Ethyl-1-hexanol	Yes	ART, BAS, EKK, SHC, TU, UCC.
n-Heptyl alcohol	No	EKK.
n-Hexyl alcohol	No	TNA, VST.
Isodecyl alcohol	No	ENJ.
Isoheptyl alcohol	No	ENJ.
Isononyl alcohol	No	ENJ.
Iso-octadecyl alcohol	No	SHX.
Iso-octyl alcohol	No	ENJ.
Isopropyl alcohol	Yes	ATR, ENJ, LYP, SHC, UCC.
Methanol, synthetic	Yes	AIP, BCP, DUP, EKT, ENJ, GGC, HCL, LYP.
Methyl amyl alcohol	No	UCC.
2-Methyl-1-pentanol	No	UCC.
4-Methyl-2-pentanol (1-Methylisobutylcarbinol)	No	ENJ, UCC.
1-Octanol	No	TNA, VST.
Propyl alcohol (Propanol)	Yes	EKK, HCL, UCC, WTH.
2-Propyn-1-ol (Propargyl alcohol)	No	GAF.
Undecanol (linear C ₁₁ alcohol)	No	BAS, ENJ.
All other alcohols, unmixed C ₁₁ or lower	No	EKT, SHC, UCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued		
Alcohols, monohydric, unsubstituted—Continued		
Alcohols C ₁₂ or higher, unmixed (95% or more pure):	Yes	
Dodecyl alcohol (Lauryl alcohol)	Yes	PG, TNA, VST.
1-Hexadecanol (Cetyl alcohol)	Yes	AAC, ENJ, PG, VST.
1-Octadecanol (Stearyl alcohol)	No	AAC, ENJ, PG, TNA, VST.
cis-9-Octadecen-1-ol (Oleyl alcohol)	No	SHX.
1-Tetradecanol (Myristyl alcohol)	No	VST.
1-Tridecanol	No	ENJ.
2,6,8-Trimethyl-4-nonanol	No	UCC.
Mixtures of alcohols:	Yes	
Mixtures of alcohols, C ₁₂ and higher	Yes	PG, SHC, SHX, TNA, VST.
All other alcohol mixtures	Yes	AAC, BAS, ENJ, NCI, PG, SCP, SHC, TNA, UCC, VST, WTK.
Esters of monohydric alcohols:		
Acrylic monomers, mixed	No	AAC, CPS.
C ₁₂ -C ₁₅ Alcohol esters of lactic acid	No	VND.
Allyl methacrylate	Yes	AAC, BRD, CPS.
Amyl acetates:		
Amyl acetate (n-Pentyl acetate)	No	UCC.
All other amyl acetates	No	WTL.
Butyl acetates:		
n-Butyl acetate	Yes	BAS, EKT, HCL, UCC.
Isobutyl acetate	Yes	BAS, EKT, EKX, HCL, UCC.
Butyl acrylate	Yes	BAS, HCL, RH, UCC.
sec-Butyl chloroformate	No	PPG, VCM, WTL.
Butyl lactate	No	CPS.
Butyl levulinate	No	SOM.
Butyl maleate	No	TCH.
Butyl mercaptopropionate	No	EVN.
Butyl methacrylate	No	DUP, RH.
Butyl oleate	No	ELC.
n-Butyl perchlorocrotonate	No	MAL.
Cetylcocyl methacrylate	No	RH.
Diallyl maleate	No	AAC, FMC.
Dibutyl maleate	No	ART, NOD.
Didecyl adipate	No	QCP.
Diethyl carbonate (Ethyl carbonate)	No	PPG.
Di(2-ethyl-1-hexyl) maleate	Yes	BRI, CHP, FTX.
Diethyl maleate	No	ACY.
Diethyl oxalate (Ethyl oxalate)	No	(²).
Dilauryl-3,3'-thiodipropionate	Yes	CCW, EVN, WTC.
Dimethyl carbonate	No	PPG.
Dimethyl maleate	No	AAC.
Dimyristyl-3,3'-thiodipropionate	Yes	CCW.
Diocetyl maleate	No	ART, NOD.
Distearyl-3,3'-thiodipropionate	No	CCW, EVN, WTC.
Dithiobis(stearyl propionate)	No	EVN.
Ditridecyl maleate	No	EFH.
Di(tridecyl)-3,3'-thiodipropionate	No	EVN, WTC.
Dodecylpentadecyl methacrylate	No	RH.
Dodecyl succinic lactate	No	SM.
2-Ethoxyethyl acetate	No	UCC.
Ethyl acetate (100% basis)	Yes	EKT, EKX, HCL, MON.
Ethyl acetoacetate	No	EKT.
Ethyl acrylate	Yes	BAS, HCL, RH, UCC.
Ethyl chloroformate	No	PPG.
Ethyl chlorothioformate	No	ICI.
Ethylene carbonate	No	TX.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Ethyl 3-ethoxy propionate	No	UCC.
2-Ethyl-1-hexyl acetate	No	EKT.
2-Ethyl-1-hexyl acrylate	Yes	BAS, HCL, UCC, VCM.
2-Ethylhexyl chloroformate	Yes	HCL, PPG, WTL.
2-Ethyl-1-hexyl methacrylate	No	DUP.
Ethyl methacrylate	No	DUP.
Ethyl sulfate (Diethyl sulfate)	No	UCC.
Fatty acid esters, not included with plasticizers or surface active agents:	Yes	
Diglycol dimerate	No	WTC.
Diisopropyl dimerate	No	SBC.
Diisostearyl dimerate	No	SBC.
Dioctyl dimerate	No	WTC.
Docosanyl docosenoate	No	SBC.
2-Ethylhexyl stearate	No	BRI.
Isocetyl stearate	No	VND.
Isopropyl linoleate	No	VND.
Isostearyl isostearate	No	SBC.
Methyl esters of coconut oil	No	WTC.
Methyl esters of lard	No	FER.
Methyl esters of tallow	No	CHL, FER.
Methyl 12-hydroxystearate	No	CAS, WTH.
Methyl iso-octadecenoate	No	SYL.
Methyl linoleate	No	HRT.
Methyl stearate	No	CHL, WTC.
Myristyl myristate	Yes	AAC, SBC, VND.
Myristyl stearate	No	AAC.
Stearyl stearate	No	AAC.
Tridecyl stearate	Yes	HCL, RPC, WTC.
All other fatty acid esters, not included with plasticizers surface-active agents	No	ALI, HDG, HPC.
Hexyl acetate	No	CPS, ENJ.
Isobutyl acrylate	No	BAS.
Isobutyl chloroformate	No	PPG, VCM.
Isobutyl isobutyrate	No	EKX.
Isobutyl methacrylate	No	RH.
Isodecyl acrylate	No	CPS.
Isodecyl mercaptoacetate	No	EVN.
Isodecyl methacrylate	No	RH.
Iso-octyl mercaptoacetate	No	CCW, EVN.
Iso-octyl-3-mercaptopropionate	No	EVN.
Isopropyl acetate	Yes	EKT, HCL, UCC.
Isopropyl chloroformate	Yes	PPG, VCM, WTL.
Isostearyl neopentanoate	No	SBC, VND.
Lauryl lactate	No	VND.
Lauryl methacrylate	Yes	AAC, CPS, RH.
1-Methoxy-2-ethyl acetate	No	EKX.
2-Methoxyethyl acrylate	No	CPS.
Methyl acetoacetate	No	EKT.
Methyl acrylate, monomer	No	BAS, HCL.
Methyl chloroformate	No	PPG.
Methyl 3,3-dimethyl-4-pentenoate	No	FMN.
Methyl formate	No	HCL.
Methyl isodehydroacetate	No	EKT.
Methyl methacrylate, monomer	Yes	CYR, DUP, RH.
Methyl sulfate (Dimethyl sulfate)	No	DUP.
Myristyl lactate	No	VND.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Octadecyl-3-mercaptopropionate	No	EVN.
Phosphorus acid esters:	Yes	
Amyl hydrogen phosphate	No	HK.
Bis (2-chloroethyl)-2-chloroethylphosphonate	No	ALW.
Bis (2-ethylhexyl)hydrogen phosphite	No	ALW.
Butyl acid phosphate	No	HK.
Chloroalkyl diphosphate ester, neutral	No	ALW.
Chloroalkyl phosphate ester	No	ALW.
Dibutyl butylphosphonate	No	ALW, HDG.
Dibutyl hydrogen phosphite	No	ALW.
Dibutyl pyrophosphate	No	ALW.
Diethylhexyl phosphoric acid	No	ALW.
Diethyl hydrogen phosphite	No	ALW.
Diethyl phosphenothionic dichloride	No	TNA.
Diethyl phosphorochlorodithionate	No	ICI, TNA.
Dimethyl hydrogen phosphite	No	ALW.
Dimethyl methylphosphonate	No	ALW, HDG.
Dimethyl phosphoridithionate	No	ICI.
Dioleil hydrogen phosphite	No	EKT.
2-Ethylhexyl hydrogen phosphate	No	ALW.
Iso-octyl hydrogen phosphate	No	ALW.
Methyl dihydrogen phosphate	No	HK.
Mixed dialkyl hydrogen phosphates	No	ELC.
Stearyl acid phosphate	No	HK.
Tetrakis (2-chloroethyl)ethylene diphosphate	No	OMC.
Tetrakis (2-chloroisopropyl)ethylene diphosphate (T-RDT)	No	OMC.
Trialkyl phosphite	No	MCB.
Trialkyl thlophosphite	No	MCB.
Tributyl phosphate	No	FMC.
Triethyl phosphite	No	ALW, ICI.
Triisodecylphosphite	No	WTC.
Triso-octyl phosphite	Yes	ALW, MCB, TX.
Trisopropyl phosphite	No	ALW.
Trimethyl phosphite	No	ALW, ICI.
Tris (2-chloroethyl)phosphate	No	PEL.
Tris (2-chloroethyl) phosphite	No	ALW, OMC.
Tris-2-chloropropyl phosphate	No	ALW, PEL.
Tris (2-ethylhexyl) phosphite	No	ALW.
All other phosphorus acid esters	No	ALW, ART, AZT, (?).
Propyl acetate	Yes	BAS, EKT, HCL, UCC.
Propyl chloroformate	No	ICI.
Propylene carbonate	No	TX.
Stearyl methacrylate	No	CPS, RH, TX.
Tetraethyl orthosilicate (Tetraethyl silicate)	No	UCC.
Tetrapropyl silicate	No	NOD, UCC.
Titanic acid esters:		
Bis [2- (bis [2-hydroxyethyl] amino) ethyl] diisopropyl titanate	No	DUP.
Bis (ethyl-3-oxobutanato) bis (2-propanolato) titanium	No	DUP.
Di (hydroxy) bis (ammoniumlactato) titanium	No	DUP.
Tetrabutyl titanate	No	DUP.
Tetraisopropyl titanate	No	DUP.
Tetrakis (2-ethylhexyl) titanate	No	DUP, NOD.
Triethanolamine titanate	No	NOD.
All other titanic acid esters	No	BUC, DUP.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Triethyl orthoacetate	No	NOD.
Triethyl orthoformate	No	NOD.
Triethyl orthopropionate	No	NOD.
Trimethyl orthoacetate	No	NOD.
Trimethyl orthoformate	No	NOD.
Vinyl acetate, monomer	Yes	DUP, FER, HCL, UCC, USI.
All other monohydric alcohol esters	Yes	AAC, BAS, COC, EKT, ENJ, MON, PD, VND, (?).
Polyhydric alcohols:		
2,2-Bis(bromomethyl)-1,3-propanediol	No	DOW.
1,2 (and 1,3)-Butanediol	No	HCL.
1,4-Butanediol	Yes	BAS, DUP, GAF.
2-Butene-1,4-diol	No	DIX, GAF.
2-Butyne-1,4-diol	No	BAS, GAF.
3-Chloro-1,2-propanediol (Glycerol α -chlorohydrin)	No	AAC, DIX, EVN.
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	No	BAS, EKX.
Ethylene glycol	Yes	BAS, CNE, CXI, DOW, DUP, EKX, HCF, HCL, OMC, PDG, PLC, SHC, TX, UCC, USI, UCC.
2-Ethyl-1,3-hexanediol	No	
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	No	HCL.
Glycerol, synthetic only	No	DOW, SYP.
1,6-Hexanediol	No	BAS, CXI, WTL.
2-(Hydroxymethyl)-2-methyl-1,3-propanediol (Trimethylolethane)	No	IMC.
Mannitol	No	ICI.
3-Mercapto-1,2-propanediol (Thioglycerol)	No	EVN.
2-Methyl-2,4-pentanediol (Hexylene glycol)	No	SHC, UCC.
Pentaerythritol	Yes	HCL, HPC, PST.
1,5-Pentanediol	No	BAS.
Propylene glycol (1,2-Propanediol)	Yes	ATR, DOW, OMC, TX, UCC.
Sorbitol (70% by Weight)	No	EHC, ICI, PFZ.
2,2,4-Trimethyl-1,3-pentanediol	No	EKX.
All other polyhydric alcohols	No	ARC, EK, ICI, SHC.
Esters and ethers of polyhydric alcohols:		
Polyhydric alcohol esters:		
2-(2-Butoxyethoxy)ethyl acetate	No	EKT, UCC.
2-Butoxyethyl acetate	No	EKT, UCC.
1,3-Butylene glycol diborate	No	USB.
1,3-Butylene glycol diborate/hexylene glycol boric anhydride	No	USB.
Diethylene glycol adipate	No	CMB, HAL.
Diethylene glycol, borated	No	OMC.
Diethylene glycol chloroformate	No	ICI, PPG.
Diethylene glycol dimethacrylate	No	CPS.
2-(2-Ethoxyethoxy)ethyl acetate	No	EKT.
Ethylene glycol diacetate	No	EKT.
Ethylene glycol diacrylate	No	CPS.
Ethylene glycol dimercaptoacetate	No	EVN.
Ethylene glycol dimethacrylate	No	CPS.
Glycerides, C ₄ -C ₁₈ and C ₁₈ -C ₁₈ mono- and di-	No	SHX, WTC.
Glycerides, mono, mixed	No	WTC.
Glycerol propoxylate triacrylate	No	REZ.
Glycerol diacetate (Diacetin)	No	HAL.
Glycerol monoacetate (Monoacetin)	No	HAL.
Glycerol monothioglycolate	No	EVN, WTC.
Glycerol triacetate (Triacetin)	No	EKT.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Esters and ethers of polyhydric alcohols—Continued		
Polyhydric alcohol esters—Continued		
Glyceryl tristearate	No	BRD.
1,6-Hexanediol diacrylate	No	REZ.
Hydroxyethyl acrylate	No	DOW, RH.
Hydroxyethyl methacrylate	No	RH.
Hydroxypropyl acrylate	No	DOW, RH.
Hydroxypropyl methacrylate	No	AAC, RH.
2-Methoxyethyl acetate	No	UCC.
Nopeopentyl glycol dicaprate	No	SBC.
Pentaerythritol stearate	No	BRD.
Pentaerythritol tetraacrylate	No	REZ.
Pentaerythritol tetrakis (3-Mercaptopropionate)	No	EVN.
Polyethylene glycol dimethacrylate	No	SQA.
Sucrose octa-acetate	No	HFT.
Tetraethylene glycol diacrylate	No	REZ.
Tetraethylene glycol dimethacrylate	No	AAC.
Trimethylolpropane decanoic acid ester	No	SM.
Trimethylolpropane ethoxylate triacrylate	No	REZ.
Trimethylolpropane triacrylate	No	AAC, CPS, REZ.
Trimethylolpropane tri(2-mercaptopropionate)	No	EVN.
Trimethylolpropane trimethacrylate	No	CPS.
Trimethylolpropane trioleate (TMP trioleate)	No	EPH.
2,2,3-Trimethyl-1,3-pentanediol monoisobutyrate	No	EKX.
Tripropylene glycol diacrylate	No	REZ.
All other polyhydric alcohol esters	No	AAC, SQA, VDM.
Polyhydric alcohol ethers:		
Bis(2-butoxyethyl) ether (Diethylene glycol di-n-butyl ether)	No	ASL, FER.
Bis(2-ethoxyethyl) ether (Diethylene glycol diethyl ether)	No	ASL, DRC, FER.
Bis(2-(2-methoxyethoxy)ethyl ether (Tetraethylene glycol dimethyl ether)	No	ASL, FER.
Bis(2-methoxyethyl) ether (Diethylene glycol dimethyl ether)	No	ASL, FER.
2-Butoxyethanol (Ethylene glycol monobutyl ether)	Yes	CNE, DOW, EKX, OMC, SHC, UCC.
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	Yes	DOW, EKX, OMC, SHC, UCC.
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	Yes	DOW, OMC, UCC.
1-Butoxyethoxy-2-propanol	No	UCC.
Butyl ethers of tetra- and higher ethylene glycols (high boiling)	No	EKX.
1-Butyraldehyde trimer	No	HTM.
Diethylene glycol	Yes	BAS, CNE, CXI, DOW, DUP, EKX, HCL, OMC, PDG, SHC, TX, UCC USI.
Diethylene glycol divinyl ether	No	GAF.
Diethylene glycol mono-n-propyl ether	No	EKX.
Difunctional epoxy acrylate	No	SQA.
Dimethoxyethane (Ethylene glycol dimethyl ether)	No	ASL, FER.
Dipropylene glycol	Yes	ATR, DOW, OMC, UCC.
Dipropylene glycol monomethyl ether	No	OMC.
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	No	EKX, OMC, UCC.
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	Yes	DOW, EKX, OMC, UCC.
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	No	DOW, OMC, UCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

<i>Miscellaneous cyclic and acyclic chemicals</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 47)</i>
Acyclic—Continued		
Ester and ethers of polyhydric alcohols—Continued		
Polyhydric alcohols ethers—Continued		
Ethylene glycol di-tributyl ether	No	EKX.
Ethylene glycol di-tri-ethyl ether	No	EKX.
Ethyl ethers of tetra and higher ethylene glycols		
(high boiling)	No	EKX, OMC.
2-[2-(Hexyloxy)ethoxy]ethanol	No	UCC.
2-Methoxyethanol (Ethylene glycol monomethyl ether)	No	OMC, UCC.
2-(2-Methoxyethoxy)ethanol (Diethylene glycol mono-methyl ether)	Yes	DOW, OMC, UCC.
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	Yes	DOW, OMC, UCC.
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	No	ASL, FER, OMC.
Methoxypolyethylene glycol	No	ICI, UCC.
1-Methoxy-2-propanol	No	OMC.
Methoxypropyl acetate	No	EKT, HTM.
Paraformaldehyde	No	HCL.
Polyethylene glycol	Yes	ABB, DOW, GAF, HCL, HDG, OMC, PPG, UCC, (2), (2).
Polyethylene glycol butyl ether, propoxylated	No	ICI.
Polyethylene glycol dimethyl ether	No	SHX, (2).
Polyglycols, ethylene glycol and glycol ether, mixed	No	CXI, HCL, UCC, (2).
Polymethylvinyl ether monoethylmaleate	No	TNI.
Polyoxyalkylene glycol	No	OMC.
Poly(oxy-1,2-ethanedyl), α -hydro- ω -hydroxy; (C ₂ H ₄ O) _n H ₂ O	No	SHX.
Polypropoxy ethers:		
Poly(propoxy)butyl ether, ethoxylated	No	TX.
Polyoxypropylene-polyoxyethylene glycol, mixed	No	UCC.
Polypropylene glycol	No	DOW, GAF, HCL, HDG, OMC, PPG, (2).
Polypropylene glycol glycerol tri-ether	No	(2).
Polytetramethylene glycol ether	Yes	BAS, DUP, QKO.
Propoxyethanol (Ethylene glycol monopropyl ether)	No	EKX.
Propylene glycol, alkoxylated	No	(2).
Propylene glycol t-butyl ether	No	HTM.
Sorbitol, alkoxylated	No	(2).
Sorbitol, ethoxylated	No	BRD, ICI, (2).
Sorbitol monooleate	No	WTC.
Sorbitol monostearate	No	WTC.
Sorbitol, propoxylated	No	ICI.
Tetraethylene glycol	No	DOW, EKX.
Tetra/penta glycols, mixed	No	CXI.
2,2'-Thiodiethanol (Thiodiglycol)	No	AAC, PLC.
Triethylene glycol	Yes	CNE, CXI, DOW, EKX, HCL, PDG, PLC, SHC, TX, UCC.
Tripropylene glycol	No	DOW, UCC.
Tripropylene glycol monomethyl ether	No	OMC.
Tri- and tetraethylene glycol monoethyl ethers, borate esters	No	OMC.
All other polyhydric alcohol ethers	No	AAC, DUP, MIL, OMC, UCC, (2).
Brominated, chlorinated and fluorinated hydrocarbons:		
Brominated (including bromochlorinated) hydrocarbons:		
1-Bromobutane (n-Butyl bromide)	No	DAZ.
Bromochloromethane	No	DOW.
Bromoethane (Ethyl bromide)	No	DOW, GTL.
1-Bromohexadecane	No	HMV.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Brominated, chlorinated and fluorinated hydrocarbons—Cont.		
Brominated (including bromochlorinated)		
hydrocarbons—Continued	Yes	
1-Bromo-2-methyl-2-butene	No	SD.
1-Bromo-octadecane	No	HMY.
1-Bromopentane (n-Amyl bromide)	No	WCC.
1-Bromopropane (n-Propyl bromide)	No	DAZ.
2-Bromopropane (Isopropyl bromide)	No	WCC.
Dibromomethane (Methylene bromide)	No	DOW.
Ethylene bis tetrabrom	No	TNA.
Myristyl bromide	No	WCC.
1,1,2,2-Tetrabromoethane (Acetylene tetrabromide)	No	DOW.
Vinyl bromide (Bromoethylene)	No	TNA.
All other brominated (including bromochlorinated)	No	
hydrocarbons	No	COC, FER, HMY, TNA.
Chlorinated (not otherwise halogenated) hydrocarbons:		
Carbon tetrachloride	Yes	DOW, FRO, HK, LCP, SFI.
Chlorinated paraffins (C ₁₀ –C ₃₀):		
Chlorinated paraffins, 35–64% chlorine	Yes	DVC, FER, HK.
Chlorinated paraffins, less than 35% chlorine	No	DVC, FER, SHC.
Chlorinated paraffins, 65% or more chlorine	Yes	DVC, FER, HK.
1-Chlorobutane (n-Butyl chloride)	No	ALW, UCC.
Chloroform	Yes	DOW, FRO, HK, LCP.
Chloromethane (Methyl chloride)	Yes	DCC, DOW, FRO, HK, LCP, SPD, VST.
3-Chloro-2-methyl-1-propene (Methallyl chloride)	No	FMC.
3-Chloropropene (Allyl chloride)	No	DOW, SHC.
1,2-Dichloroethane (Ethylene dichloride)	Yes	BCP, BFG, DOW, FOR, FRO, GGC, HK, OMC, PPG, SHC, VST.
1,2-Dichloropropane (Propylene dichloride)	No	DOW.
2,3-Dichloropropane	No	DOW, SHC.
2,2-Dimethylchloropropane (neopentyl chloride)	No	ALD.
Ethyl chloride (Chloroethane)	Yes	DOW, DUP, PPG, TNA.
2-Ethylhexyl chloride	No	ALW.
Methylene chloride (Dichloromethane)	Yes	DOW, FRO, HK, LCP.
Neophyl chloride	No	TNA.
Octyl chloride	No	TNA.
Paraffin oils, chlorinated	No	BAS.
Perchloroethylene (Tetrachloroethane)	Yes	DOW, FRO, HK, MIL, PPG.
1,1,1-Trichloroethane (Methyl chloroform)	Yes	DOW, FRO, PPG.
1,1,2-Trichloroethane (Vinyl trichloride)	No	DOW.
Trichloroethylene	No	DOW, PPG.
Vinyl chloride, monomer (Chloroethylene)	Yes	BCP, BFG, DOW, FOR, GGC, HK, PPG, VST.
Vinylidene chloride, monomer (1,1-Dichloroethylene)	No	DOW, PPG.
All other chlorinated (not otherwise halogenated)	No	
hydrocarbons	No	COC, (?).
Fluorinated (including other fluorohalogenated)		
hydrocarbons:	Yes	
Bromochlorodifluoromethane	No	GTL, ICI.
2-Bromo-1-chloro-1,2,2-trifluoroethane	No	HOC.
2-Bromo-2-chloro-1,1,1-trifluoroethane (Halothane)	No	HOC.
Bromotrifluoromethane	No	DUP, GTL.
1-Chloro-1,1-difluoroethane (F-142b)	No	PAS.
Chlorodifluoroethane (F-22)	Yes	ACS, DUP, KAI, LRO, PAS, RCN.
Chlorotrifluoroethylene (Trifluorovinyl chloride)	No	ACS.
2-Chloro-1,1,2-trifluoroethyl methyl ether	No	OH.
Chlorotrifluoromethane (F-13)	No	DUP.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Brominated, chlorinated, and fluorinated hydrocarbons—Continued		
Fluorinated (including other fluorohalogenated) hydrocarbons—Continued		
Dibromodifluoromethane	No	GTL.
Dichlorodifluoromethane (F-12)	Yes	ACS, DUP, KAI, LRO, PAS, RCN.
Dichlorotetrafluoroethane (F-114)	No	ACS, DUP.
1,1-Difluoroethane	No	DUP.
Hexafluoropropylene, monomer	No	DUP.
1-Iodoperfluorohexane	No	DUP.
Polytetrafluoroethylene ethyl iodide	No	(²).
Tetrafluoroethylene, monomer (F-1114)	No	DUP, ICI.
Tetrafluoromethane (F-14)	No	DUP.
Trichlorofluoromethane (F-11)	Yes	ACS, DUP, KAI, LRO, PAS, RCN.
Trichlorotrifluoroethane (F-113)	No	ACS, DUP, PAS.
Trifluoropropene	No	HOC.
Vinyl fluoride, monomer	No	DUP.
Vinylidene fluoride, monomer	No	PAS.
All other fluorinated (including other fluorohalogenated) hydrocarbons	No	COC, DUP, HOC, REG.
Other miscellaneous acyclic chemicals:		
Iodinated (not otherwise halogenated) hydrocarbons:		
Diodomethane (Methylene iodide)	No	DPW.
Iodobutane	No	RSA.
Iodoethane (Ethyl iodide), non-medical	No	DPW, RSA.
Iodomethane (Methyl iodide)	No	DPW, RSA.
Isopropyl iodide	No	DPW.
All other iodinated (not otherwise halogenated) hydrocarbons	No	COC, DPW, RSA.
Acetylacetonates:		
Cobaltic acetylacetonate	No	SHP.
Titanium acetylacetonate	No	NOD.
All other acetylacetonates	No	SHP.
Acetylacetonates complexes:		
Aluminum acetylacetonate complex	No	MCK.
Iron acetylacetonate complex	No	MCK.
Zinc acetylacetonate complex	No	MCK.
Acyclic peroxides:		
Acetylacetone peroxide	No	CAD.
tert-Amyl hydroperoxide	No	WTC.
2-Butanone peroxide (MEK peroxide)	Yes	CAD, FRE, NOC, WTC, WTL.
n-Butyl-4,4-bis[t-butylperoxy]valerate	No	WTL.
tert-Butyl hydroperoxide	No	ATR, AZT, FRE, WTL.
tert-Butyl peroxide (Di-tert-butyl peroxide)	Yes	AZT, WTC, WTL.
tert-Butyl peroxyacetate	No	AZT.
tert-Butyl peroxy-2-ethylhexanoate	No	WTC, WTL.
tert-Butyl peroxyisobutyrate	No	WTL.
tert-Butyl peroxyisopropylcarbonate	No	WTL.
tert-Butylperoxymaleic acid	No	WTC, WTL.
tert-Butyl peroxyneodecanoate	No	WTC, WTL.
tert-Butyl peroxy-pivalate	Yes	AZT, WTC, WTL.
Decanoyl peroxide	No	WTL.
Di(sec-butyl)peroxydicarbonate	No	WTL.
Di-(2-ethylhexyl) peroxydicarbonate	No	WTC, WTL.
Diisononanyl peroxide	No	WTL.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane	No	WTL.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3	No	WTL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Acyclic peroxides—Continued		
2,5-Dimethyl-2,5-d1 (2-ethylhexanoyl peroxy) hexane	No	WTL.
DI-n-propyl peroxydicarbonate	No	WTL.
Ethyl 3,3-di(t-butyl peroxy) butyrate	No	WTL.
Lauroyl peroxide	No	WTL.
Peroxyacetic acid (Peracetic acid)	No	FMB, FMC, UCC.
Succinyl peroxide	No	WTL.
Tertiary amyl per-2-ethylhexanoate	No	WTC.
All other acyclic peroxides	No	WTC.
Carbon disulfide	No	PAS.
2,3-Dibromopropanol	No	GTL.
1,3-Dichloro-2-propanol	No	ARS.
Epoxides, ethers, and acetals:		
Bis(2-chloroethyl)ether (Dichlorodiethyl ether)	No	BKM.
Butylene oxide	No	DOW.
Butyl vinyl ether	No	GAF.
Chloromethyl methyl ether	No	RH.
2,2-Dichloro-1,1-difluoroethyl methyl ether	No	OH.
Diethoxyethane	No	FER, WPG.
Dimethyl sulfone	No	CRZ.
Epichlorohydrin	No	DOW, SHC.
Ethylene oxide	Yes	BAS, CNE, DOW, EKX, HCL, OMC, SHC, SUN, TX, UCC, USI, VST.
Ethyl ether, absolute	No	EKX, USI.
Ethyl vinyl ether	No	GAF.
Glycidol (2,3-Epoxy-1-propanol)	No	DIX.
Glycidyl ethers:		
Alkyl glycidyl ethers, C ₁₂ -C ₁₄	No	REZ, TRC, WLN.
Alkyl glycidyl ethers, C ₈ -C ₁₀	No	TRC, WLN.
1-(Allyloxy)-2,3-epoxypropane (Allyl glycidyl ether)	No	AAC, CPS.
1,4-Butanediol diglycidyl ether	No	REZ, TRC, WLN.
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	Yes	CPS, REZ, TRC, WLN.
2-Ethylhexyl glycidyl ether	No	TRC, WLN.
Polyol glycidyl ether	No	REZ, WLN.
All other glycidyl ethers	No	REZ, WLN.
Isopropyl ether	No	ENJ, SHC.
Methylal (Dimethoxymethane)	No	HCL.
Methyl ether (Dimethyl ether)	No	AIP.
Methyl vinyl ether	No	GAF, UCC.
Propylene oxide	No	ATR, DOW.
1,1,3,3-Tetramethoxypropane	No	NOD, UCC.
All other epoxides, ethers, acetals	No	UCC.
2-(Ethylmercapto)ethanol	No	DOM.
Ethyl succinyl chloride	No	CWN.
Fats and oils, chemically modified:		
Chlorinated fatty materials	No	FER.
Hydrogenated menhaden fish oil	No	CHL, WTC.
Hydrogenated tallow glycerides	No	CHL, WTC.
Sulfurized corn oil	No	SM.
Vegetable glycerides, hydrogenated	No	BRD, WTC.
All other fats and oils, chemically modified	No	CAS, CHL, CJO.
Glutaraldehyde bis(sodium bisulfite)	No	FMT.
Hexadecylsulfonyl chloride	No	EKT.
Hydrocarbons:		
n-Decane	No	HMY, PLC.
n-Dodecane	No	HMY, PLC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Hydrocarbons—Continued		
Hexadecane	No	HMV.
Myrcene	No	SCM, (2).
n-Nonane	No	HMV.
n-Octadecane	No	HMV.
n-Octane	No	HMV, PLC.
n-Tetradecane	No	HMV.
All other hydrocarbons	No	DUP, HMV, PLC, WTK.
2-Mercaptoethanol	No	AAC, PLC.
Mercox disulfide	No	LYP.
Methyl sulfide (Dimethyl sulfide)	No	GAY, PAS.
Methyl sulfoxide (Dimethyl sulfoxide)	No	GAY.
Octadecanoic acid, 2-(1-carboxyethoxy)-1-methyl-2-oxoethyl ether, sodium salt	No	WTC.
Organo-aluminum compounds:	Yes	
Aluminum diisopropoxide acetoacetic ester chelate ..	No	CHT, KCH.
Aluminum ethyl-3-oxobutanoate-0 ¹ ,0 ² -dihydroxy T-4	No	CHT, KCH.
Aluminum isooctoxide, diisopropoxide	No	KCH.
Aluminum isopropoxide (Aluminum isopropylate)	No	CHT, KCH.
Aluminum tri-sec-butoxide	No	CHT.
Diethylaluminum chloride	No	TNA, TSA.
Diethylaluminum dimethylethyl siloxide	No	(2).
Diethyl aluminum ethoxide	No	TSA.
Diethylaluminum iodide	No	TNA, TSA.
Diisobutylaluminum chloride	No	TNA, TSA.
Diisobutylaluminum hydride	No	TNA, TSA.
Di-n-octylaluminum iodide	No	TSA.
Di-n-propylaluminum chloride	No	TSA.
Ethylaluminum dichloride	No	TNA, TSA.
Ethylaluminum sesquichloride	No	TNA, TSA.
Isobutylaluminum chloride	No	TNA, TSA.
Isopropenylaluminum	No	TSA.
Oxoaluminum isopropoxide	No	KCH.
Oxoaluminum stearate	No	KCH.
Oxy-aluminum octanoate	No	CHT, KCH.
Sodium dihydrobis(2-methoxyethoxy) aluminum hydride	No	HXL.
Tri-n-butylaluminum	No	TNA, TSA.
Triethylaluminum	No	TNA, TSA.
Tri-n-hexyl aluminum	No	TNA, TSA.
Trisobutylaluminum	No	TNA, TSA.
Trimethylaluminum	No	TNA.
Tri-n-octylaluminum	No	TNA, TSA.
Tri-oxyaluminum tri-isopropoxide	No	CHT.
All other organo-aluminum compounds	No	KCH, MCB, MRF, TNA.
Organo-boron compounds:	Yes	
Boric acid-amine adducts	No	FER.
Boron trichloride-amine complex (DY 9577)	No	ASL.
N-Methyl-methanamine with borane (1:1)	No	(2).
2-Methyl-2-propanamine with borane (1:1)	No	(2).
Mixed alcohol borates	No	(2).
Triethylborane	No	(2).
Triethyl borate	No	ADC.
Triethylboron	No	TSA.
Trimethoxyboroxine	No	(2).
N,N,N-Trimethyl methanaminium octahydrotriborate	No	(2).
All other organo-boron compounds	No	HCL, MCK, MHI, (2).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Organo-lithium compounds:		
n-Butyllithium	No	FTE.
sec-Butyllithium	No	FTE.
Lithium hydroxystearate	No	WTC.
Organo-magnesium compounds:		
Butyl ethyl magnesium	No	TSA.
Di-n-butylmagnesium	No	TSA.
Di-n-hexyl magnesium	No	TSA.
Magnesium methylate	No	SOI.
All other organo-magnesium compounds	No	(²).
Organo-silicon compounds:		
N-Aminoethylaminopropyl trimethoxysilane	No	NOD.
α-Chloropropyltrichlorosilane	No	DCC.
Chloropropyltrimethoxysilane	Yes	DCC, NOD, UCC.
Chlorotrimethylsilane	No	DCC.
Dichlorodimethylsilane	No	DCC.
Dichloromethylsilane	No	DCC.
Dichloromethylvinylsilane	No	DCC.
Dilsobutyl dimethoxychloro silane	No	NOD.
Divinyl tetramethyldisiloxane	No	NOD.
α-Glycidoxypropyltrimethoxysilane	No	NOD, UCC.
Hexamethyldisilazane	No	NOD, SCM.
Isobutyltrimethoxysilane	No	NOD.
Mercaptopropyltrimethoxysilane	No	NOD, UCC.
α-Methacryloxypropyltrimethoxysilane	No	NOD, UCC.
Methyltrimethoxysilane and polymethyltrisiloxane	No	DCC, UCC.
N-Octyltriethoxy silane	No	SCM.
Polyoxyalkene silicones	No	UCC.
Silicone fluids	Yes	DCC, SPD, SWS, UCC.
Trichloromethylsilane	No	DCC.
Trichloropropylsilane	No	DCC.
Trichlorovinylsilane	No	UCC.
(Trimethoxysilyl propyl) didecyl methylammonium chloride	No	NOD.
Trimethylsilyldiazo-methane	No	NOD.
Tris (2-methoxyethoxy) vinyl silane	No	NOD.
Tris (pentamethyldisiloxanyl) -3-methacrylatopropyl-silane	No	(²).
Vinyltriethoxysilane	No	NOD, UCC.
Vinyl trimethoxy silane	No	NOD.
All other organo-silicone compounds	No	ARO, BRI, DUP, GGI, NOD, UCC, (²).
Organo-tin compounds:		
Dibutyltin bis (isooctylmercaptoacetate)	No	WTC, (²).
Dibutyltin bis (mercaptolaurate)	No	(²).
Dibutyltin diacetate	No	COS.
Dibutyltin dichloride	No	WTC, (²).
Dibutyltin dilaurate	No	COS.
Dibutyltin oxide	No	WTC, (²).
Dimethyltin dichloride	No	WTC.
Dimethyltin-IOTG	No	WTC.
Diocetyl tin dilaurate	No	COS.
Monomethyl tin	No	WTC.
Organotin mercaptides	No	CCW.
Tributyltin fluoride	No	(²).
All other organo-tin compounds	No	SCM, (²), (²).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Organo-zinc compounds:		
Diethylzinc	No	TSA.
Perchloromethanethiol (Perchloromethyl mercaptan)	No	ICI.
Perfluoroalkyl polyether	No	(²).
Phosgene (Carbonyl chloride)	Yes	DUP, ICI, MOB, OMC, PPG.
Pine oil, synthetic	No	NCL.
Polyhexafluoropropylene oxide	No	DUP.
Polymethacrylic acid esters	No	DUP.
Potassium 2-methyl-2-butanol	No	(2).
Potassium 2-methyl-2-propanol	No	(2).
Sodium methoxide (Sodium methylate)	No	HK.
Thioethanol, sodium salt	No	BAS.
Trifluoroethanol	No	HOC.
All other miscellaneous acyclic chemicals	No	ASL, CGY, COC, EK, GAF, GPI, HMP, HFC, MCK, NOD, PAH, PIC, RSA, SHX, TCC, TNA, TSA, USR, (²), (²), (²), (²).
Mixtures not specifically itemized: Yes		
Alcohols, monohydric, and their esters, C ₉ and higher ...	No	EKX.
Butyl formcel	No	HCL.
Celtone	No	HCL.
Fatty acid residues	Yes	DRL, SHX, SYP, WTC.
Gluconic acid and salts, mixed	No	PMP.
Glycol residues	No	OMC.
Methacrylate based cationic polyelectrolytes	No	COS.
Methyl formcel	No	HCL, NOD.
Morpholine residue stream	No	TX.
Oxldate light ends	No	HCF.
Oxo process bottoms	No	CXI.
Propionic blends	No	HCL.
All other mixtures not specifically itemized	No	BAS, CGY, CXI, DUP, EKT, HCL, JSC, MON, NES, UCC, WAY.

¹ Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

² The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 47

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
AAC	Alcolac, Inc.	COS	Cosan Chemical Corp.
ABB	Abbott Laboratories	CPS	CPS Chemical Co., Inc.
ACS	Allied Signal Inc., Engineered Material Sector	CRZ	James River Corp.
ACY	American Cyanamid Co.	CWN	Upjohn Co., Fine Chemicals
ADC	Anderson Development Co.	CXI	Chemical Exchange Industries, Inc.
AIP	Air Products & Chemicals, Inc.	CYR	CYRO Industries
ALD	Aldrich Chemical Co., Inc.	DAN	Dan River Inc., Chemical Products Div.
ALI	Anzon, Inc.	DAZ	Diaz Chemical Corp.
ALW	Albright & Wilson, Inc.	DCC	Dow Corning Corp.
AMB	American Bio-Synthetics Corp.	DIX	Dixie Chemical Co., Inc.
AMO	Amoco Corp.	DKA	Mobay Synthetics Corporation
ANG	Angus Chemical Co.	DOM	Dominion Products, Inc.
ARC	Akzo Chemie America, Armak Chemicals	DOW	Dow Chemical Co.
ARO	Arnco	DPW	Deepwater, Inc.
ARS	Arsynco, Inc.	DRC	Dock Resins Corp.
ART	Aristech Chemical Corp., Chemical Div.	DRL	Unichema Chemicals, Inc.
ARZ	Arizona Chemical Co.	DUP	E. I. duPont de Nemours & Co., Inc. AF/FP Dept.
ASH	Ashland Oil, Inc.		Chemicals & Pigments Dept.
ASL	Specialtychem Products Corp.		Petrochemicals Dept.
ATL	Atlantic Industries, Inc.		Polymer Products Dept.
ATR	Atlantic Richfield Co., Arco Chemical Co.	DVC	Dover Chemical Corp. Sub. of ICC Industries, Inc.
AZT	Catalyst Resources, Inc.	EFH	E. F. Houghton & Co.
BAS	BASF Corp.	EHC	Ethichem Corp.
BCC	Buffalo Color Corp.	EK	Eastman Kodak Co.:
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	EKT	Tennessee Eastman Co. Div.
BKC	J. T. Baker Chemical Co.	EKX	Texas Eastman Co. Div.
BKM	Buckman Laboratories, Inc.	ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.
BOC	Biocraft Laboratories, Inc.	EMR	Quantum Chemical Corp., Emery Division
BOR	Borden Inc., Borden Chemical Div.	ENJ	Exxon Chemical Americas
BRD	Lonza, Inc.	ESA	East Shore Chemical Co.
BRI	Sedgiefied Specialties	EVN	W. R. Grace & Co., Organic Chemicals Div., Evans Chemetics
BTL	BTL Specialty Resin Corp.	FER	Ferro Corp.:
BUC	Synalloy Corp., Blackman Uhler Chemical Div.		Ferro Chemical Div.
CAD	Akzo Chemie America, Noury Chemicals		Grant Chemical Div.
CAS	Caschem, Inc.		Kell Chemical Div.
CBD	Chembond Corp.	FMB	FMC Corp., Peroxygen Chemicals Div.
CCA	Akzo Chemicals, Inc.	FMC	FMC Corp.
CCC	C.N.C. International Inc.	FMN	FMC Corp., Agricultural Chemical Group
CCW	Morton-Thiokol, Inc., Carstab Div.	FMT	Fairmount Chemical Co., Inc.
CGY	Ciba-Geigy Corp.	FOC	Handschy Industries, Inc., Farac Varnishes Chemicals
CHG	Mobay Chemical Corp., Agricultural Chemicals Div.	FOR	Formosa Plastics Corporation Louisiana
CHL	Chemol, Inc.	FRE	Freeman Chemical Corp.
CHP	C. H. Patrick & Co., Inc.	FRO	Vulcan Materials Co., Chemicals Div.
CHT	Chattem, Inc.	FTE	Foote Mineral Co.
CIN	Stockhausen, Inc.	FTX	Finetex, Inc.
CJO	C. J. Osborn, Div. of Suvar Corp.	GAF	GAF Corp., Chemical Group
CMB	Cambridge Industries Co.	GAY	Gaylord Container
CNE	Cain Chemical, Inc.	GE	General Electric Co.
CNP	DSM Chemicals Augusta, Inc.	GFS	G. Frederick Smith Chemical Co.
COC	Columbia Organic Chemicals Co., Inc.		

See footnotes at the end of table.

Table 47—Continued

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1988

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
GGC	Georgla-Gulf Corp.: Plaquemine Div.	MLS	Miles Laboratories, Inc., Blotechnology Group
GGI	Grow Group, Inc.	MNA	Monsanto Agricultural Co.
GIV	Givaudan Corp.	MOB	Mobay Chemical Corp., Pittsburgh Div.
GON	W.R. Grace & Co., Organic Chemicals Div. Nitroparaffins	MON	Monsanto Co.
GP	Georgia-Pacific Corp., Resins Operations	MRF	Morflex Corp.
GPI	Grindsted Products, Inc.	MRK	Merck & Co., Inc.
GTL	Great Lakes Chemical Corp.	NCC	Niacet Corp.
HAL	C. P. Hall Co.	NCI	Union Camp Corp., Terpene & Aromatics Div.
HCC	Hatco Chemical Corp.	NCI	Union Camp Corp., Chemical Products Div.
HCF	Cape Industries	NES	Ruetgers-Nease Chemical Co.
HCL	Hoechst Celanese Corp: Chemical Group Inc. Fine Chemicals Division Sou-Tex Works	NOC	Norac Co., Inc. Mathe Div.
HCP	Honig Chemical & Processing Corp.	NOD	Huls America Inc.
HDG	Hodag Chemical Corp.	OH	Anaquest
HFT	Syntex Agrilbusiness, Inc., Nutrition & Chemical Div.	OMC	Olin Corp.
HK	Occidental Chemical Corp., & Specialty Chemical Div.	ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.
HML	Hummel Chemical Co.	PAC	Pacific Anchor Chemical Corp.
HMP	W. R. Grace & Co., Hampshire Chemicals Div.	PAH	Parish Chemical Co.
HMV	Humphrey Chemical Co.	PAS	Pennwalt Corp.
HOC	Halocarbon Products Corp.	PCI	Piedmont Chemical Industries, Inc.
HPC	Hercules, Inc.	PD	Parke-Davis, Div. of Warner-Lambert Co.
HRT	Hart Products Corp.	PDG	P.D. Glycol
HTM	Haltermann Ltd. Co.	PEL	Pelron Corp.
HXL	Hexcel Corp., Hexcel Chemical Products	PFN	Pfanstiel Laboratories, Inc.
ICI	ICI Americas, Inc.: Agricultural Chemical Div. Chemicals Div. Rubicon Inc.	PFZ	Pfizer, Inc. and Pfizer Pharmaceuticals, Inc.
IMC	IMC Pitman-Moore Industrial Chemicals Div.	PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.
JRC	Jarchem Industries, Inc.	PIC	Pierce Chemical Co.
JSC	Sybron Chemicals, Inc.	PLC	Phillips 66 Co.
KCH	Joseph Ayers, Inc.	PLS	Plastics Engineering Co.
KLM	Kalama Chemical, Inc.	PMP	PMP Fermentation Products, Inc.
KMI	Kemin Industries, Inc.	PPG	PPG Industries, Inc.
LCP	LCP Chemicals - West Virginia, Inc.	PSG	PMC Specialties Group, Inc.
LEM	Napp Chemicals, Inc.	PST	Perstorp Polyols, Inc.
LIL	Eli Lilly & Co.	QCP	Quaker Chemical Corp.
LRO	Laroche Chemicals, Inc.	QKO	QO Chemicals, Inc.
LYP	Lyondell Petrochemical Co.	RCI	Relchhold Chemicals, Inc.
MAL	Mallinckrodt, Inc.	RCN	Racon, Inc.
MCB	Borg-Warner Corp., Borg-Warner Chemicals	RDA	Rhone-Poulenc, Inc.
MCI	Mooney Chemicals, Inc.	REG	Regis Chemical Co.
MCK	MacKenzie Chemical Works, Inc.	REM	Remington Arms Co., Inc.
MHI	Morton-Thiokol, Inc., Ventron Div.	REZ	Hi-Tek Polymers, Inc.
MIL	Milliken & Co., Milliken Chemical Div.	RH	Rohm & Haas Co.
		RPC	Colloids, Inc.
		RSA	R.S.A. Corp.
		S	Sandoz, Inc.
		SBC	Scher Chemicals, Inc.
		SC	Sterling Chemicals, Inc.
		SCM	SCM Glidco Organic
		SCM	SCM Corp., PCR, Inc.
		SCN	Schenectady Chemicals, Inc.
		SCP	Henkel Corp.

See footnotes at the end of table.

Table 47—Continued

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
SD	Sterling Drug, Inc.:	TRO	Troy Chemical Corp.
	Sterling Pharmaceuticals, Inc.	TSA	Texas Alkyls, Inc.
SDC	Sandoz Chemicals Corp.	TU	Tenn-USS Chemicals Co.
SDW	Sterling Drug, Inc. Sterling Organics Div.	TX	Texaco, Inc., Texaco Chemical Co.
SHC	Shell Oil Co., Shell Chemical Co. Div.	TZC	Magneslum Elektron, Inc.
SHP	Shepherd Chemical Co.	UCC	Union Carbide Corp.
SHX	Sherex Chemical Co., Inc.	UPM	UOP, Inc.
SK	SmithKline Chemical	USB	U. S. Borax & Chemical Corp., U.S. Borax Research Corp.
SM	Mobil Oil Corp.:	USI	Quantum Chemical Corp., USI Div.
	Chemical Products Div.	USR	Uniroyal, Inc., Unroyal Chemical Div.
SOH	BP Chemicals America	UTC	Unitex Chemical Corp.
SOI	Specialty Organics, Inc.	VCM	Vanchem, Inc.
SOM	Southland Corp.	VDM	Van De Mark Chemical Co., Inc.
SPD	General Electric Co., Silicone Products Dept.	VEL	Velsicol Chemical Corp.
SQA	Sequa Chemicals, Inc.	VIK	Viking Chemical Co.
SUN	Sun Co., Inc.	VNC	Vanderbilt Chemical Corp.
SWS	Wacker Silicones	VND	Van Dyk, Div. of Mallinckrodt, Inc.
SYL	Arizona Chemical Co.	VST	Vista Chemical Co.
SYP	Synthetic Products Co., Division of Plastic	WAY	Olin Hunt Specialty Products, Inc.
	Specialties & Technology, Inc.	WCC	White Chemical Corp.
TCC	Sybron Chemicals, Inc.	WCL	Wright Chemical Corp.
TCH	Quantum Chemical Corp.	WLN	Wilmington Chemical Corp.
TLC	Twin Lake Chemical, Inc.	WM	Inolex Chemical Co.
TLI	Teledyne Industries, Inc.:	WPG	West Point-Pepperell, Inc., Griffitex Chemical Co. Sub.
	Teledyne McCormick Selph	WTC	Witco Chemical Corp.
TMH	Hacros Chemicals, Inc.	WTH	Union Camp Corp.
TNA	Ethyl Corp.	WTK	Whittaker Corp., Helcol Chemicals Div.
TNI	Gillette Co., Chemical Div.	WTL	Penwalt Corp., Luicdol Div.
TRC	Trilmont Chemicals, Inc.	WVA	Westvaco Corp.,

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

APPENDIX A
DIRECTORY OF MANUFACTURERS

Table A-1

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
AEP	A & E Plastic Inc	818-968-3801	14505 Proctor Ave. Industry, CA 91749.
ABB	Abbott Laboratories	312-937-3452	1401 Sheridan Rd., N. Chicago, IL 60064.
ILI	Acme Steel Company	312-849-2500	13500 S. Perry Avenue Riverdale, IL 60627.
ACO	Adco Chemical Co	201-589-0880	129 Rutherford St., Newark, NJ 07105.
AIP	Air Products & Chemicals, Inc	215-481-4911	7201 Hamilton Blvd, Allentown, PA 18195-1501.
AJY	Ajay Chemicals, Inc	404-943-6202	1400 Industry Rd., Powder Springs, GA 30073.
AJI	Ajinomoto U.S.A., Inc	201-488-1212	4020 Ajinomoto Dr., Raleigh, NC 27610.
CCA	Akzo Chemical, Inc	201-247-2202	500 Jersey Ave, New Brunswick, NJ 08903
ARC	Akzo Chemical Inc., Armak Chemicals	312-906-7500	300 S. Riverside, Plaza Chicago, IL 60606.
CAD	Akzo Chemle America, Noury Chemicals	716-778-8554	2153 Lockport-Olcott Rd., Burt, NY 14028
FRP	Akzo Coating Inc	912-367-3616	P.O. Box 3219 Baxley Georgia 31513.
ALW	Albright & Wilson, Americas Inc	804-752-6100	P. O. Box 26229, Richmond, VA 23260.
ALC	Alco Chemical Corp	615-629-1405	P. O. Box 5401, Chattanooga, TN 37406.
AAC	Alcolac, Inc	301-859-4900	1099 Winterson Rd., Baltimore, MD 21226.
ALD	Aldrich Chemical Co., Inc	414-273-3850	940 W. St. Paul Ave., Milwaukee, WI 53233.
ALE	Alex Chemical Co	717-462-3500	119 N. Union St., Shenandoah, PA 17976.
ACH	Alco Chemical Corp	316-783-1321	P.O. Box 247, Galena, KS 66739.
ALG	Allegheny Chemical Corp	814-772-3965	Gillis Ave., Ridgway, PA 15853.
ALL	Alliance Chemical, Inc	201-945-5400	Linden Ave., Ridgefield, NJ 07657.
BME	Allied Signal-Bendix, Friction Materials Div.	518-270-0200	P. O. Box 238 Troy, NY 12180.
ACS	Allied Signal Inc	201-455-4312	Columbia Rd & Park Ave., Morristown, NJ 07960.
ACS	Engineered Plastic Div.		
ACS	Allied-Signal, Inc	504-775-4330	12875 Scenic Hwy, Baton Rouge, LA 70892-3006.
	High Density Polyethylene Business		
	Engineered Materials Sector	201-455-4911	P.O. Box 1051 R, Morristown, NJ 07054
ALX	Alox Corp	716-282-1295	3943 Buffalo Ave., Niagara Falls, NY 14303.
APH	Alpha Corporation of Tennessee	901-853-2450	423 Highway 57 East, Collerville, TN 38017.
ALP	Alpha Laboratories, Inc	303-756-1338	P. O. Box 22223, Denver, CO 80222.
HES	Amerada Hess Corp. (Hess Oil Virgin	201-750-6000	1 Hess Plaza, Woodbridge, NJ 07095-0961.
AMB	American Bio-Synthetics Corp	414-384-7017	710 W. National Ave., Milwaukee, WI 53204.
ACY	American Cyanamid Co	201-831-2768	One Cyanamid Plaza, Wayne, NJ 07470.
AMU	American Emulsions, Inc	404-226-7028	1202 Dozier St., Dalton, GA 30721.
API	American Polymers, Inc	617-987-0144	Old Webster Rd., Oxford, MA 01540.
ASY	American Synthetic Rubber Corp	502-449-8300	P. O. Box 32960, Louisville, KY 40232.
SPO	Ameripol Synpol Co. Div. of Uniroyal Goodrich Tire Co	216-762-4442	146 South High St. Akron, OH 44308-1493.
HVG	Ametek, Inc., Haveg Div	302-995-0400	900 Greenbank Rd., Wilmington, DE 19808.
AMO	Amoco Corporation	312-856-6111	P. O. Box 87703 Mall Code 1201, Chicago, IL 60680-0703.
AMV	Amvac Chemical Corp	213-264-3910	4100 E. Washington Blvd., Los Angeles, CA 90023.
OH	Anaquest	608-273-0019	2005 W. Beltline Hwy., Madison, WI 53713.
ADC	Anderson Development Co	517-263-2121	1415 E. Michigan St., Adrian, MI 49221.
ANG	Angus Chemical Co	312-498-6700	2211 Sanders Rd., Northbrook, IL 60062.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
ALI	Anzon, Inc	215-427-3000	2545 Aramingo Ave., Philadelphia, PA 19125.
APX	Apex Chemical Co	201-354-5420	200 S. First St., Elizabeth, NJ
APC	Apollo Chemical Corp	919-226-1161	1105 Southerland St., Graham, NC 27253.
APO	Apollo Colors, Inc	312-564-9190	3000 Dundee Suite 415, Northbrook, IL 60062.
AQU	Aqualon Co	302-996-2030	2711 Centerville Rd., Wilmington, DE 19850-5417.
ARD	Ardmore Inc	201-481-2406	29 Riverside Ave., Newark, NJ 07104.
ART	Arlstech Chemical Corp.: Chemical Div	412-433-2747	600 Grant St., Pittsburgh, PA 15230-0250.
ARN	Arenol Chemical Corp	201-526-5900	189 Meister Ave., Somerville, NJ 08876
ARZ	Arizona Chemical Co	904-785-6700	1001 E. Business Hwy, 98, Panama City, FL 32401, and P.O. Box 947 Port St. Joe, FL 32456.
ALS	Armco, Inc., Eastern Steel Div	513-425-2744	703 Curtis St., Middletown, OH 45043.
ARP	Armour Pharmaceutical Co	815-932-6771	P. O. Box 511, Kankakee, IL 60901.
ARK	Armstrong World Industries, Inc	717-397-0611	3331 Liberty Street, Lancaster, PA 17604.
ARO	ARNCO	714-739-7900	One Centerpointe Dr., LaPalma, CA 90623-1094.
ARL	Arol Chemical Products Co	201-344-1510	649 Ferry St., Newark, NJ 07105.
ARS	Arsynco, Inc., Sub Div. of Aceto Corp	718-898-2300	126-02 Northern Blvd., Flushing, NY 11368.
ASH	Ashland Oil, Inc	614-889-3333	P. O. Box 2219, Columbus, OH 43216.
	Ashland Petroleum Co	606-329-3333	P. O. Box 391, Ashland, KY 41114.
BLA	Astor Products, Inc., Blue Arrow Div	904-783-5000	5244 Edgewood Ct., Jacksonville, FL 32205.
ATL	Atlantic Industries, Inc	201-235-1800	10 Kingsland Rd., Nutley, NJ 07110.
ATR	Atlantic Richfield Co., Arco Chemical Co	215-359-2000	3801 Westchester Pike. Newtown Square, PA 19073.
APD	Atlas Powder Co., sub. of Tyler Corp	214-387-2400	P. O. Box 87, Joplin, MO 64802.
ARI	Atlas Refinery, Inc	201-589-2002	142 Lockwood St., Newark, NJ 07105.
RSN	Atochem Inc. Polymers Div	201-447-3300	266 Harristown Rd. Glen Rock, N.J. 07452.
AUX	Auralux Corp	203-886-2616	29 Scott Ave., Norwich, CT 06360.
AUS	Ausimont N.V	617-736-1400	128 Technology Drive, Waltham, MA 02254.
SOH	BP Chemical Inc	216-586-4141	200 Public Square 31-4105-N Cleveland, OH 44114 - 2375.
	BP America:		
SIF	Filon Div	213-757-5141	12333 South Van Ness Ave., Hawthorne, CA 90250.
SIC	Silmar Div	213-757-1801	12333 South Van Ness Ave., Hawthorne, CA 90250.
CO			
SIO	BP Oil Company	419-226-2300	1150 South Metcalf Street, Lima, OH 45804.
BAS	BASF Corp. Chemicals Div	201-316-2937	100 Cherry Hill Rd., Parsippany, NJ 07054.
ICF	Coating & Colorants	201-365-3400	1255 Broad St., Clifton, NJ 07015.
BTL	BTL Speciality Resin Corp	419-244-5856	2112 Sylvan Ave., Toledo, Oh. 43606.
BKC	J. T. Baker Chemical Co	201-859-2151	222 Red School Lane, Phillipsburg, NJ 08865.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
KPT	Beazer Materials & Services, Inc	412-227-2000	Koppers Bldg. 436 7th Ave., Pittsburgh Pa. 15219.
BCK	Beckman Instruments, Inc Diagnostic Systems Group	619-993-8740	2470 Faraday Ave. Carlsbad, CA 92008.
BIB	Spinco Div Beecham, Inc.:	714-871-4848	1050 Page Mill Rd., Palo Alto, CA 94304.
BEE	Beecham Laboratories Div	201-469-5200	101 Possumtown Rd., Piscataway, NJ 08854.
BEW	Beecham Western Hemisphere, Inc	201-881-3000	3 Garret Mountain Plaza, West Paterson, NJ 07424.
BCM	Belding Chemical Industries	212-944-6040	P.O. Box 130 Hendersonville, NC 28793
BLZ	Belzak Corp	201-773-0602	850 Bloomfield Ave., Clifton, NJ 07012.
BTS	Bethlehem Steel Corp	215-694-4522	866 Martin Tower - 8th Fl., Bethlehem, PA 18016.
BOC	Blocraft Laboratories, Inc	201-796-3434	12 Industrial Park, Waldwick, NJ 07463.
BNP	Bison Nitrogen Products Co	712-277-1340	Terra Centre, 600 4th St., Slouxy City, IA 51101.
BOE	Boehme Filatex, Inc	919-342-1051	Rt. 11 Box 5 Reidsville, N.C. 27320.
BOT	Boots Co. (USA) Inc	312-405-7400	300 Tristate Int'l Ctr. Suite 200 Lincolnshire, IL 60015.
BOR	Borden, Inc.:		
	Borden Chemical Div	614-225-4000	180 E. Broad St., Columbus. OH 43215.
MCB	Borg-Warner Corp., Borg-Warner Chemicals	304-424-5411	International Center, Parkersburg, WV 26101.
BFP	Breddo Inc	913-321-5300	18th & Kansas Ave., Kansas City, KS 66105.
BMC	Brin-Mont Chemicals, Inc	919-292-0566	3921 Spring Garden St., Greensboro, NC 27407.
BRS	Bristol-Myers Co	212-546-4000	345 Park Ave., New York, NY 10154.
BRU	M. A. Bruder & Sons, Inc	215-353-5100	52nd & Grays Ave., Philadelphia, PA 19143.
BKM	Buckman Laboratories, Inc	901-278-0330	1256 N. McLean Blvd., Memphis, TN 38122.
BCC	Buffalo Color Corp	716-827-4500	P. O. Box 7027., Buffalo, NY 14210.
BRR	Burris Chemical, Inc., Color Div	803-277-8977	175 Eschelon Rd., Greenville, SC 29605.
BUR	Burroughs Wellcome Co	919-248-3000	3030 Cornwallis Rd., Research Triangle Park, NC 27709.
CFI	CF Industries, Inc	312-438-9500	Salem-Lake Dr., Long Grove, IL 60047.
CLU	CL Industries, Inc	217-662-2136	P. O. Box 218 Georgetown, IL 61846.
CCC	C.N.C. International, Inc CPC International, Inc.:	401-769-6100	20 Privledge St., Woonsocket, RI 02895.
ACR	Acme Resin Corp	312-343-1900	10330 W. Roosevelt Rd. Westchester, IL 60153.
CPS	CPS Chemical Co., Inc	201-727-3100	P. O. Box 162, Old Bridge, NJ 08857.
CYR	CYRO Industries	201-930-2000	100 Valley Rd., Mr. Arlington, NJ 07856.
CNE	Cain Chemical, Inc	713-623-2246	5 Greenway Plaza, Houston, TX 77046.
GRL	Calgon Corp., Calgon Vestal Laboratories Div.	314-862-2000	5035 Manchester Ave., St. Louis, MO 63110.
CMB	Cambridge Industries Co	617-924-0026	440 Arsenal St., Watertown, MA 02172.
HCF	Cape Industries	919-341-5500	P. O. Box 327 Wilmington, NC 28402.
SVC	Capital City Products Co	608-752-9007	1530 S. Jackson St., Janesville, WI 53545.
CBC	Carbose Corp	814-443-1611	100 Maple St., Somerset, PA 15501.
CGL	Cargill, Inc	612-475-7646	P. O. Box 5630, Minneapolis, MN 55428.
CDT	Carondelet Coke Corp	314-638-2400	526 E. Catalan Street St. Louis, MO. 63111.
CHC	Carpenter Chemical Co	804-359-0800	P. O. Box 27205, Richmond, VA 23261.
BSC	Cascade Resins, Inc	503-343-2111	P. O. Box 1989, Eugene, OR 97440.
CAS	Caschem, Inc	201-858-7900	40 Avenue A, Bayonne, NJ 07002.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
AZT	Catalyst Resources, Inc	713-957-6813	2190 North Loop West, Suite 400, Houston, TX 77018.
CCL	Catawba-Charlab, Inc	704-523-4242	5046 Old Pineville Rd., Charlotte, NC 28217.
CED	Cedar Chemical Co	901-685-5348	P.O. Box 3 Vicksburg, MS 39180
CED	Cedar Chemical Co	501-572-3701	Highway 242 South, West Helena, AR 72390.
		901-685-5348	and P. O. Box 3, Vicksburg, MS 39180.
CNT	Certainteed Corp	215-341-7000	P. O. Box 860, Valley Forge, PA 19482.
CPR	Certified Processing Corp	201-923-5200	U.S. Highway #22, Hillside, NJ 07205.
GRS	Champlin Refining, Co	512-882-8871	P. O. Box 9176, Corpus Christi, TX 78469.
CHH	Chr. Hansen's Laboratory, Inc	414-476-3630	9015 W. Maple St., West Allis, WI 53214.
CHT	Chattem, Inc	615-821-4571	1715 W. 38th St., Chattanooga, TN 37409.
CBD	Chembond Corp	503-687-8840	1600 Valley River Dr., Suite 390, Eugene, OR 97401.
CFX	Chemfax, Inc	601-863-6511	10045 Three River Rd., Gulfport, MS 39503.
CXI	Chemical Exchange Industries, Inc	713-526-8291	3813 Buffalo Speedway, Houston, TX 77098.
CMT	Chemithon Corp	206-937-9954	5430 W. Marginal Way, SW., Seattle, WA 98106.
CHL	Chemol Co	919-272-3121	2410 Randolph Ave., Greensboro, NC 27406.
CRT	Chemos Corp	201-966-0044	225-235 Emmet St., Newark, NJ 07114.
SOC	Chevron Corp., Chevron Chemical Co	415-842-5500	6001 Bollinger Canyon Rd., San Ramon, 94583.
CMC	Chromatic Color Corp	502-737-1700	305 Ring Rd., Elizabethtown KY, 42701.
CGY	Ciba-Gelgy Corp	914-478-3131	444 Saw Mill River Rd., Ardsley, NY 10502.
FJI	Cincinnati Varnish Co	513-631-4270	1776 Mentor Ave., Cincinnati, OH 45212.
CGO	Citgo Petroleum Corp	918-495-4000	P. O. Box 1562, Lake Charles, LA 70602.
CGU	Citizens Gas & Coke Utility	317-631-2181	3133 Southeastern Ave., Indianapolis, IN 46203.
ACT	Climax Performance Materials Corp	214-333-2151	7666 W. 63rd St. Summit, IL 60501
CSP	Coastal Refining & Marketing Inc	713-877-1400	Nine Greenway Plaza, Houston, TX 77046.
CP	Colgate-Palmolive Co.	212-310-2000	300 Park Ave., New York, NY 10022.
RPC	Colloids Lyndal Div	404-259-4831	1338 Coronet Drive Dalton, Ga. 30720.
CLD	Colloids, Inc	201-926-6100	P.O. Box 769, Marietta, GA 30061.
CIC	Color Chem International Corp	201-444-8563	7 Plymouth Rd., Glen Rock, NJ 07452.
CCS	Colorado Chemical Specialties, Inc	303-245-8148	569 24-1/4 Rd., Grand Junction, CO 81505.
CRS	Colorado Reslns, Inc	303-245-8148	569 24-1/4 Rd., Grand Junction, CO 81505.
CNC	Columbia Nitrogen Corp	404-823-4300	P.O. Box 1483, Augusta, GA 30903.
COC	Columbia Organic Chemical Co., Inc	803-425-1786	1424 Mt. Zion Road, Cassatt SC 29032.
CAC	Cominco Fertilizers Inc	509-747-6111	W. 18th Riverside Ave., Spokane, WA 99201.
CMP	Commercial Products Co., Inc	201-427-6887	117 Ethel Ave., Hawthorne, NJ 07506.
CNI	Conap, Inc	716-372-9650	1405 Buffalo St., Olean, NY 14760.
CON	Concord Chemical Co., Inc	609-966-1526	17th & Federal Sts., Camden, NJ 08105.
CO	Conoco Specialty Products, Inc	713-293-1764	600 N. Dairy Ashford Rd. Houston, TX 77079.
OTL	Continental Chemical Co	201-472-5000	270 Clifton Blvd. Clifton, NJ 07011-3686
CTP	Continental Polymers, Inc	213-637-2103	2225 E. Del Amo Blvd., Compton, CA 90220.
CPV	Cook Paint & Varnish Co	816-391-6000	P. O. Box 419389, Kansas City, MO 64141.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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Identification Code	Name of company	Telephone number	Office address
COP	Coopers Creek Chemical Corp	215-828-0375	River Rd., West Conshohocken, PA 19428.
CPY	Copolymer Rubber & Chemical Corp	504-355-5655	P. O. Box 2591, Baton Rouge, LA 70821.
COS	Cosan Chemical Corp	201-460-9300	400 - 14th St., Carlstadt, NJ 07072.
CMS	Cosmic Plastics, Inc	818-365-3249	12314 Gladstone Ave., San Francisco, CA 91342.
CRD	Croda, Inc	212-683-3089	183 Madison Ave., New York, NY 10016.
CK	Crompton & Knowles Corp	215-775-8000	P. O. Box 341, Reading, PA 19603.
CCP	Crown Central Petroleum Corp	301-539-7400	1 N. Charles St., Baltimore, MD 21203.
USM	Crown Metro, Inc	803-299-1331	Echelon Road, Donaldson Centre, Greenville, SC 29606.
CYT	Cumberland International Corp	713-682-1221	1523 N. Post Oak Rd., Houston, TX 77055.
CTR	Customs Resins Div. of Bemis Co., Inc	502-826-7641	Highway 136 West, Henderson, KY 42420.
AMD	Cyclo Products, Inc	213-582-6411	1922 E. 64th St., Los Angeles, CA 90001.
CNP	DSM Chemicals Augusta, Inc	404-823-4240	P. O. Box 2451, Augusta, GA 30903.
POP	Daicolor Pope, Inc	201-279-2702	33 Sixth Ave Paterson, NJ 07524.
MAR	Daishowa Chemical Inc	203-625-0701	81 Holly Hill Lane Greenwich, CT 06830.
DAN	Dan River, Inc., Chemical Products Div	804-799-7000	P. O. Box 261, Danville, VA 24543.
DPI	Dart Polymers, Inc., Sub. of Dart Container Corp.	517-676-3800	432 Hogsback Rd., Mason, MI 48854.
DGO	Day-Glo Color Corp	216-391-7070	4515 St. Clair Ave., Cleveland, OH 44103.
DPW	Deepwater, Inc	714-751-3522	P. O. Box 17599, Irvine, CA 92713.
DGC	Degussa Corp	201-641-6100	65 Chassenger Rd., Ridgefield Park, NJ 07660.
DRR	Delta Resins & Refractories, Inc	414-462-1200	6263 N. Teutonia Ave., Milwaukee, WI 53209.
DNS	Dennis Chemical Co	314-771-1800	2700 Papin St., St. Louis, MO 63103.
DRB	Derby Co., Inc	508-342-5831	119 Authority Dr., Fitchburg, MA 01420.
DSO & PLX	DeSoto, Inc	312-391-9000	1700 S. Mt. Prospect Rd., Des Plaines, IL 60018.
UDI	DeSoto, Inc	312-391-9000	1220 N. Main Place, Fort Worth, TX 76106.
DTR	Detroit Coke Corp	312-842-6222	7819 West Jefferson Ave., Detroit, MI. 48209.
DEX	Dexter Chemical Corp	212-542-7700	845 Edgewater Rd., Bronx, NY 10474.
HYA	Dexter Corp, Dexter Adhesives Structural Materials Div.	415-687-4201	2850 Willow Pass Road, Pittsburgh, CA. 94565.
HYC	Dexter Corp., Dexter Electronic Materlal Div.	818-968-6511	15051 E. Don Julian Rd., Industry, CA 91749.
MID	Mldland Div	312-623-4200	E. Water St., Waukegan, IL 60085.
AGP	Dlal Corp	602-248-2800	2000 Aucutt Rd., Montgomery, AL 60538.
DA	Diamond Shamrock Refining & Marketing	512-641-6800	P. O. Box 696000, San Antonio, TX 78269-6000.
DAZ	Diaz Chemical Corp	716-638-6321	40 Jackson St., Holley, NY 14470.
PLN	Disogrln Industries Corp	603-669-4050	Grenier Industrial Alrpark, Manchester, NH 03103.
DIX	Dixie Chemical Co., Inc	713-526-2604	3635 W. Dallas Ave., Houston, TX 77019.
DRC	Dock Resins Corp	201-862-2351	1512 W. Elizabeth Ave., Linden, NJ 07036.
DOM	Dominion Products, Inc	718-499-3050	882 - 3rd Ave., Brooklyn, NY 11232.
DVC	Dover Chemical Corp. Sub. of ICC	216-343-7711	W. 15th & Davis Sts., Dover, OH 44622.
DOW	Dow Chemical Co	517-636-6125	2020 Willard H. Dow Center, Midland, MI 48674.
DCC	Dow Corning Corp	517-496-4000	P.O. Box 994, Midland, MI 48686-0994.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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Identifi- cation Code	Name of company	Telephone number	Office address
ABP	Drummond Company, Inc	205-945-6301	P. O. Box 10246, Birmingham, AL 35209.
WBG	Dryden Oil Co White & Bagley Div	617-791-3201	688-692-Millburyst, Worchester, Ma. 01607
CHO	Ducon	618-654-2070	P. O. Box 219, Highland, IL 62249.
DUP	E. I. duPont de Nemours & Co., Inc	302-774-1000	1007 Market St., Wllmington, DE 19898.
DSC	Dye Specialties, Inc	201-866-9504	100 Plaza Center, Secaucus, NJ 07096.
AGI	EMS-American Grillon, Inc	803-481-9173	P. O. Box 1948, Sumter, SC 29151.
ECC	Eastern Color & Chemical Co	401-331-9000	35 Livingston St., Providence, RI 02904.
EK	Eastman Kodak Co	716-724-4000	343 State St., Rochester, NY 14650.
EKT	Tennessee Eastman Co. Div	615-229-2000	P. O. Box 1974, Kingsport, TN 37662.
EKX	Texas Eastman Co. Div	214-236-5012	P. O. Box 7444, Kingsport, TN 37662.
ESA	East Shore Chemical Co,	616-726-3106	1221 E. Barney Ave., Muskegon, MI 49443.
ELN	Elan Chemical Co	201-344-8014	268 Doremus Ave., Newark, NJ 07105.
ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.	216-749-2605	1000 Beltline Rd. Cleveland OH 44109.
USM	Emhart Corp., Bostik Div	617-777-0100	Boston St., Middleton, MA 01949.
EMK	Emkay Chemical Co	201-352-7053	319-315 Second St P.O. Box 42, Elizabeth, NJ 07206
EKO	Empire Coke Co	205-323-2400	1927 1st Ave., N., Birmingham, AL 35203.
ENO	Enenco, Inc	901-320-5800	755 Crossover Lane, Memphis, TN 38117.
HSH	Engelhard Corp	201-632-6000	3400 Band Street, Louisville, KY 40212.
SAR	Esschem, Inc	215-521-3800	P. O. Box 56, Esslinton, PA 19029.
ESS	Essential Industries, Inc	414-691-3000	28391 Essential Rd., Merton, WI 53056.
EHC	Ethiochem Corp	201-933-7880	150 Grand St., Carlstadt, NJ 07072.
ETC	Ethox Chemicals, Inc.	803-277-1620	P.O. Box 5094, Station B, Greenville, SC 29606.
TNA	Ethyl Corp	804-788-5000	330 S. 4th St., Richmond, VA 23217.
AVA	Eval Co. Of America	312-719-4610	1001 Warrenville Rd., Lisle, IL 60532.
ENJ	Exxon Chemical Americas	713-870-6000	P.O. Box 3272, Houston, TX 77253-3272.
FMC	FMC Corp	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMN	Agricultural Chemical Group	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMB	Peroxygen Chemicals Div	716-876-8300	Sawyer Ave. & River Rd., Town of Tonawanda, NY 14150.
FAB	Fabricolor Manufacturing Corp	201-742-3900	P.O. Box 2398, Paterson, NJ 07509.
FMT	Fairmount Chemical Co., Inc	201-344-5790	117 Blanchard St., Newark, NJ 07105.
FRI	Farmland Industries, Inc	816-459-6000	P.O. Box 308, Lawrence KS 66044.
	Farmland Industries, Inc	816-238-8111	1417 Lower Lake Rd., St. Joseph, Mo 64502.
FEL	Felton World Wide, Inc	718-497-4664	599 Johnson Ave., Brooklyn, NY 11237.
SDS	Fermenta Plant Protection	216-357-4100	5966 Heisley Rd., Mentor, OH 44061-8000.
FER	Ferro Corp		
	Bedford Chemical Div	216-641-8580	7050 Krick Rd., Bedford, OH 44146.
	Grant Chemical Div	504-654-6801	P. O. Box 263, Baton Rouge, LA 70770.
	Keil Chemical Div	219-931-2630	3000 Sheffield Ave., Hammond, IN 46320.
FBI	Fiber Industries, Inc	704-357-2000	5146 Parkway Plaza Blvd., Charlotte, NC. 28217.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div	214-750-2400	8350 N. Central, Dallas, TX 75206.
FTX	Finetex, Inc	201-797-4686	418 Falmouth Ave., Elmwood Park, NJ 07407.
	Firestone Tire & Rubber Co.:		
FRF	Firestone Fibers & Textile Co	216-379-7000	P. O. Box 450, Hopewell, VA 23860.
FRS	Firestone Synthetic Rubber & Latex Co. Div.	216-379-7495	P.O. Box 26611, Akron, OH 44319-0006.
CI	Firmenich, Inc	609-452-1000	P.O. Box 5880, Prlncton, NJ 08543.

Table A-1—Continued

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Identifi- cation Code	Name of company	Telephone number	Office address
FST	First Chemical Corp	601-762-0870	P. O. Box 1427, Pascagoula, MS 39567.
FPC	Flambeau Paper Corp	715-762-3231	200 N. First Ave., Park Falls, WI 54552.
FLM	Fleming Laboratories, Inc	704-372-5613	2215 Thrift Rd., Charlotte, NC 28234.
CIK	Flint Ink Corp., Cal/Ink Div	415-525-1188	1404 - 4th St., Berkeley, CA 94710.
EFP	Fluorocarbon Co	216-274-3171	Main & Orchard Sts. Mantua, OH 44255.
FTE	Foote Mineral Co	215-889-9605	301 Lindenwood Drive Suite 301, Malvern Pa. 19355.
FOR	Formosa Plastics Corp—Louisiana	504-356-3341	P. O. Box 271, Baton Rouge, LA 70821.
	Formosa Plastics Corp—USA	201-966-6980	66 Hanover Rd., Florham Park, NJ 07932.
BDS	Fragrance Resource, Inc	201-264-6767	275 Clark Street Keyport, NJ 07735.
FLN	Franklin International	614-443-0241	2020 Bruck St., Columbus, OH 43207.
FRE	Freeman Chemical Corp	414-284-5541	217 Freeman Dr. Port Washington, WI 53074.
WLC	Freeport McMoran Resource Partners	504-582-4000	1615 Poydras St. New Orleans, LA 70112.
FB	Fritzsche Dodge & Olcott, Inc	212-929-4100	76 - 9th Ave., New York, NY 10011.
FLH	H.B. Fuller Co	612-645-3401	3530 North Lexington Ave., St. Paul, MN 55126.
COO	H.B. Fuller Co	617-658-3351	820 Woburn St. Wilmington, MA 01887.
GAF	GAF Chemical Corp	201-628-3000	P. O. Box 12, Linden, NJ 07036.
GLX	Galaxie Chemical Corp	201-279-0558	26 Piercy St., Paterson, NJ 07524.
GAN	Ganes Chemicals, Inc	201-507-4300	630 Broad St., Carlstadt, NJ 07072.
GAY	Gaylord Chemical Corp	206-254-0922	P.O. Box 1209, Slidell, LA 70459-1209.
GNT	Gencorp Polymers Products	216-869-4200	165 S. Cleveland Ave. Mogadore, OH 44260.
GNR	Genencor, Inc	415-742-7500	180 Kimball Way, S. San Francisco, CA 94080.
GE	General Electric Co.:		
	Electromaterials	614-622-5310	1350 S. Second St., Coshocton, OH 43812.
	Plastics Business Group	413-448-6394	1 Plastics Ave., Pittsfield, MA 01201.
GEP	Plastics Div	413-448-7110	1 Plastics Ave., Pittsfield, MA 01201.
SPD	Silicone Products Div	518-237-3330	Mechanicville Road, Waterford, NY 12188.
GNF	General Foods Manufacturing Corp., Maxwell House Coffee Co	201-420-3432	1125 Hudson St., Hoboken, NJ 07030.
GLC	General Latex and Chemical Corp	617-576-8000	P.O. Box 498, Ashland, OH 44805.
GRG	P.D. George Co	314-621-5700	5200 N. Second St., St. Louis, MO 63147.
GGC	Georgia Gulf Corp:		
	Houston Div	404-395-4549	400 Perimeter Ctr., Terr. Suite 595, Atlanta, GA 30346.
	Plaquemine Div	404-395-4500	400 Perimeter Center Terrace, Suite 595, Atlanta, GA 30348.
	PVC Compound Div	404-395-4500	P.O. Box 629 Plaquemine, LA 70765-0629.
	Georgia-Pacific Corp.:		
PSP	Bellingham Div	206-733-4410	P. O. Box 1236, Bellingham, WA 98227.
GP	Resins Inc	404-521-4000	133 Peachtree St. NE., Atlanta, GA 30303.
TNI	Gillette Chemical Co	617-421-7000	3500 W. 16th St., N. Chicago, IL 60064.
GIV	Givaudan Corp	201-365-8000	100 Delawanna Ave., Clifton, NJ 07014.
GLD	Glidden Company	216-344-8000	925 Euclid Ave., Cleveland OH 44115.
BFG	B. F. Goodrich Co	216-447-7802	6100 Oak Tree Blvd., Cleveland, OH 44131.
HGC	Goodson Polymers, Inc	801-272-9000	1250 South Union St., Troy, OH 45373.
GYR	Goodyear Tire & Rubber Co	216-796-2121	1144 E. Market St., Akron, OH 44316.
	W. R. Grace & Co.:		
HMP	Hampshire Chemicals Div	617-861-6600	55 Hayden Ave., Lexington, MA 02173.
EVN	Organic Chemicals Div., Evans Chemetics	617-861-6600	55 Hayden Ave., Lexington, MA 02173.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
CON	W. R. Grace & Co.—Continued: Organic Chemical Div. Nitroparafins	617-861-6600	55 Hayden Avenue., Lexington, MA 02173.
GRD	Organic Chemicals & Polymers Div	617-861-6600	55 Hayden Ave., Lexington, MA 02173.
GPC	Grain Processing Corp	319-264-4211	1600 Oregon Street, Muscatine, IA 52761-0349.
CPC	Grant Industries, Inc	201-791-6700	P. O. Box 360, Elmwood Park, NJ 07407.
GTL	Great Lakes Chemical Corp	317-497-6100	P.O. Box 2200, W. Lafayette, IN 47906.
GNW	Greenwood Chemical Co	703-456-6832	State Hwy. #690, Greenwood, VA 22943.
GDC	Gresco, Mfg. Inc	919-475-8101	216 E. Holly Hill Rd., Thomasville, NC 27360.
GPI	Grinstead Products, Inc	913-764-8100	200 Industrial Parkway Industrial Airport, KA 66031.
GGI	Grow Group Inc	301-939-1234	1354 Old Post Rd., Havre De Grace, Md. 21078.
GRV	Guardsman Chemicals, Inc	616-452-5181	1350 Steele Ave. S.W., Grand Rapids, MI 49507.
GSS	Gulf States Steel, Inc	205-543-6201	174 South 26th St., Gadsden AL 35904-1935.
GTH	Guth Corp	414-488-3202	P.O. Box 347, Slinger, WI 53086.
HAR	Haarmann & Relmer Corp	201-686-3132	70 Diamond Rd., Springfield, NJ 07081.
HAL	C. P. Hall Co	312-767-4600	7300 S. Central Ave., Chicago, IL 60638.
HOC	Halocarbon Products Corp	201-343-8703	82 Burlews Ct., Hackensack, NJ 07601.
HTM	Haltermann Ltd. Co.	713-452-5951	16717 Jacintoport Blvd., Houston, TX 77015.
FOC	Handschy Industries, Inc., Ink and Chemical Div.	312-597-7990	13601 S. Ashland Ave., Riverdale, IL 60627-1099.
HAN	Hanna Chemical Coatings Corp	614-294-3361	1313 Windsor Ave., Columbus, OH 43216.
TMH	Harcross Chemicals, Inc	913-321-3131	5200 Speaker Rd., Kansas City, KS 66110.
HRT	Hart Products Corp	201-433-6665	173 Sussex St., Jersey City, NJ 07302.
HCC	Hatco Chemical Co	201-738-1000	King George Post Rd., Fords, NJ 08863.
HKY	Hawkeye Chemical Co	319-243-5800	P. O. Box 899, Clinton, IA 52732.
HAP	Helmerich & Payne, Inc., Natural Gas Odorizing Div.	713-424-5568	3601 Decker Dr., Baytown, TX 77520.
SCP	Henkel Corp	612-828-8000	2200 Remissance Blvd., Gulph Mills, PA 19406.
HPC	Hercules, Inc	302-594-5000	Hercules Plaza, Wilmington, DE 19894.
HER	Heresite Protective Coating, Inc	414-684-6646	822 S. 14th St., Manitowoc, WI 54220.
HTN	Heterene Chemical Corp	201-278-2000	790 - 21st Ave., Paterson, NJ 07513.
HEU	Heubach Inc	201-596-6170	Heubach Ave., Newark, NJ 07114.
HEC	Hewchem	601-863-6600	P.O. Box 188, Gulfport, MS 39502.
HEW	Hewitt Soap Co., Inc	513-253-1151	333 Linden Ave., Dayton, OH 45403.
HXL	Hexcel Corp: Chemical Products Div	805-498-1399	35470 Conejo Rd., Newbury Park CA 91320.
	Chemical Products Div	616-772-2193	215 N. Centennial St., Zeeland, MI 49464.
HIP	High Point Chemical Corp	919-884-2214	243 Woodbine St., High Point, NC 27261.
SDG	Hill Petroleum Company	203-661-4770	P.O. Box 5038, Houston, TX 77262-5038
SDH	Hilton Davis Chemical Co	513-841-4000	2335 Langdon Farm Rd., Cincinnati, OH 45237.
BEZ	HI-Tek Polymer	502-499-4011	9808 Bluegrass Parkway, Louisville, KY 40299.
RPC	HI-Tek Polymers, Inc., Lyndal Div	404-259-4831	1338 Coronet Dr., Dalton, GA 30720.
HDG	Hodag Chemical Corp	312-675-3950	7247 N. Central Park Ave., Skokie, IL 60076.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address	
HCL	Hoechst Celanese Corp:			
	Bayport Works	201-231-2000	12212 Port Rd., Pasadena, TX 77507.	
	Chemical Group Div	214-689-4000	1250 W. Mockingbird Lane, Dallas, TX 75247.	
	Engineering Plastics Div	201-635-2600	26 Main St., Chatham, NJ 07928.	
	Fibers Div	704-554-2000	4000 Barclay Down Drive, Charlotte, NC 28232.	
	Fibers Industrial Div	803-579-5522	P.O. Box 5887, Spartanburg, SC 29304-5887.	
HOF	Fine Chemical Div	804-393-3100	801 Water St., Portsmouth, VA 23704.	
	SpecialtyChem Group Coventry Plant ..	201-231-2000	129 Quidnick St., Coventry, RI 02816.	
	Sou-Tex	704-827-7531	P.O. Box 866, Mt. Holly, NC 28120.	
		201-235-5000	340 Kingsland St., Nutley, NJ 07110.	
HCP	Hoffmann-LaRoche, Inc	201-344-0881	414 Wilson Ave., Newark, NJ 07105.	
EFH	Hong Chemical & Processing Corp	215-666-4000	P.O. Box 930, Valley Forge, PA 19482.	
NOD	E. F. Houghton & Co	201-981-5000	80 Centennial Ave., Piscataway, NJ 08855-0456.	
HML	Hummel Chemical Co., Inc	201-754-1800	10 Harmlich Rd., S. Plainfield, NJ 07080.	
	HMV	Humphrey Chemical Co	203-281-0012	45 Divine St., N. Haven, CT 06473-0325.
	HNT	Huntington Laboratories, Inc	219-356-8100	970 E. Tipton St., Huntington, IN 46750.
	HMN	Huntsman Chemical Corp	801-532-5200	2000 Eagle Gate Tower, Salt City, UT 84111.
ICI	ICI Amerleas, Inc:			
	Agricultural Products Div	302-479-8000	Delaware Corp. Center, Wilmington, DE 19897.	
	Films Group Div	302-575-3986	Concord Pike & Murphy Rd., Wilmington, DE 19897.	
	Polyurethanes Group	609-423-7400	Mantua Grove Rd., W. Deptford, NJ 08066.	
IMC	Resin Div	617-658-6600	730 Main St., Wilmington, DE 19897.	
	Specialty Product	302-575-3557	Concord Pike & Murphy Rd., Wilmington, DE 19897.	
IMC	IMC Pittman-Moore	812-232-0121	P.O. Box 207, Terre Haute, IN 47808.	
IMC	IMC Pittman-Moore Industrial Chemical ..	312-566-2600	421 E. Hawley St., Mundelein, IL 60060.	
RAY	Industrial Chemical Div			
IGC	ITT Rayonier, Inc	203-348-7000	P.O. Box 68967, Seattle WA 98188.	
IND	Indiana Gas & Chemical Corp	812-232-0231	1341 Hulman St., Terre Haute, IN 47808.	
IDC	Indof Color Co., Inc	201-242-1300	129 Newark Ave., Elizabeth, NJ 07201.	
INL	Industrial Color, Inc	815-722-7402	50 Industry Ave., Joliet, IL 60435.	
WM	Inland Steel Co	312-346-0300	3210 Watling, St., E. Chicago, IL 46312.	
SPC	Inolex Chemical Co	215-271-0800	Jackson & Swanson Sts., Philadelphia, PA 19148.	
IMI	Insilco Corp., Sinclair Paint Co. Div	213-268-2511	6100 South Garfield Ave., Los Angeles, CA	
IMC	Insulating Materials, Inc	518-395-3304	1 Campbell Rd., Schenectady, NY 12306.	
GBF	International Blo-Synthetics Inc	704-527-9000	90040.	
IFF	International Bio-Synthetics Inc	201-264-4500	P.O. Box 241068, Charlotte, NC 28224-1068.	
IPC	International Flavor & Fragrances Inc	201-264-4500	1515 Highway #36, Union Beach, NJ 07735.	
IOV	Interplastic Corp	612-331-6850	2015 NE Broadway, Minneapolis, MN 55413.	
CRZ	Iovite, Inc	312-481-8900	21625 Oak St., Matteson, IL 60443.	
JRC	James River II, Inc. Specialty	206-834-8134	4th & Adams Sts., Camas, WA 98607.	
JFR	Chemicals Div			
JRG	Jarchem Industries, Inc	201-587-4551	40 Ball St., Newark, NJ 07105.	
JTO	George A. Jeffreys & Co., Inc	703-389-8220	P. O. Box 909, Salem, VA 24153.	
MRX	Andrew Jergens Co	513-421-1400	2535 Spring Grove Ave., Cincinnati, OH 45214.	
JNS	Jetco Chemicals, Inc	214-872-3011	P. O. Box 1898, Corsicana, TX 75110.	
JNS	Johnson Matthey, Inc.:	215-971-3000	2002 Nolte Dr., W. Deptford, NJ 08066.	
JNS	S. C. Johnson & Son, Inc	414-631-2000	1525 Howe St., Racine, WI 53403.	

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
JOB	Jones-Blair Co	214-353-1600	2728 Empire Central, Dallas, TX 75045.
KLM	Kalama Chemical, Inc	206-682-7890	Suite 1110, Bank of California Center, Seattle, WA 98164.
KTP	Kama Corp., Kent Polymers, Inc	717-455-2021	666 Dietrich Ave., Hazelton, PA 18201.
KAN	Kanasco, Ltd	301-789-7800	6118 Robinwood Road, Baltimore, MD 21125.
KMP	Kelly-Moore Paint Co., Inc	415-592-8337	987 Commercial St., San Carlos, CA 94070.
KMI	Kemin Industries, Inc	515-266-2111	2100 Maury St., Des Moines, IA 50301.
KPI	Kenrich Petrochemicals, Inc	201-823-9000	140 E. 22nd St., Bayonne, NJ 07002-0032.
KYS	Keycor Century Corp	805-259-2360	P. O. Box 308, Saugus, CA 91350.
KCW	Keystone Color Works, Inc	717-854-9541	151 W. Gay Ave., York, PA 17403.
CHF	Kincaid Enterprises, Inc	304-755-3377	P. O. Box 549, Nitro, WV 25143.
KHI	Koch Refining Co	316-832-5500	P. O. Box 2302, Wichita, KS 67201.
LCP	LCP Chemicals: Maine Div. of Hanlin Group Inc	201-225-4840	P. O. Box 149, Orrington, ME 04474.
	West Virginia, Inc	304-843-1310	P. O. Box Box J, Moundsville, WV 26041.
LTV	LTV Steel Co., Inc	216-622-5000	LTV Steel Bldg., 25 W. Prospect Ave., Cleveland, OH 44115.
LKY	Lake States Div. of Rhineland Paper Co.	715-369-4217	515 W. Davenport St., Rhineland, WI 54501.
LRO	LaRoche Chemical, Inc	504-356-8406	P.O. Box 1031, Baton Rouge, LA 70821.
ARM	LaRoche Industries Inc	404-851-0407	1100 Johnson Ferry Rd., Atlanta GA 30342.
LII	Lawter International, Inc	312-498-4700	990 Skokie Blvd., Northbrook, IL 60062.
LEA	Leatex Chemical Co	215-739-6324	2722 N. Hancock St., Philadelphia, PA 19133.
LLI	Lee Laboratories, Inc	804-862-2534	2999 Frontage Rd., Petersburg, VA 23805.
LVR	C. Lever Co., Inc	215-639-8640	736 Dunks Ferry Rd., Bensalem, PA 19020.
LEV	Lever Brothers Co	212-688-6000	390 Park Ave., New York, NY 10022.
LIL	Ell Lilly & Co	317-261-2000	Lilly Corporate Center, Indianapolis, IN 46285.
	Ell Lilly Industries, Inc	809-757-4000	Call Box 1198 - Pueblo Station, Carolina, PR 00630-1198.
LIC	Lilly Industrial Coatings, Inc	317-634-8512	P. O. Box 946, Indianapolis, IN 46206.
LMC	Lomac, Inc	616-788-2341	5025 Evanston Ave., Muskegon, MI 49443.
BRD	Lonza, Inc	201-794-2400	17-17 Route 208, Fair Lawn, NJ 07410.
LC	Lord Corp., Chemical Products Group	814-868-3611	2000 W. Grandview Blvd., Erle, PA 16514-0038.
LCS	Louisiana Chemical Polymers	504-775-1801	12537 Scenic Hwy., Baton Rouge, LA 70807.
LYP	Lyondell Petrochemical Co	713-652-7200	1221 McKinney, Suite 1600, Houston, TX 77253-3646.
MCK	MacKenzie Chemical Works, Inc	504-886-2173	Rte 2 Box 667, Deer Park, NY 11729.
MCC	McCloskey Corp. McCloskey Varnish Co.: McCloskey Varnish Co., California	215-624-4400 213-726-7272	7600 State Rd., Philadelphia, PA 19136. 5501 E. Slanson Avenue, Los Angeles, CA 90040.
STG	McCloskey Varnish Co., Oregon	503-226-3751	4155 N.W. Yeon Ave., Portland, OR 97210.
	McCormick & Co., Inc., McCormick- Stange, Flavor Div.	301-667-7401	230 Schilling Circle S., Hunt Valley, MD 21031.
MGK	McLaughlin Gormley King Co	612-544-0341	8810 - 10th Ave., N., Minneapolis, MN 55427.
MNP	McWhorter, Inc	312-428-2657	400 E. Cottage Place, Carpentersville, IL 60110.
MAK	MAK Chemical Corp	317-288-4464	1200 Rochester Ave., Muncie, IN 47307-0423.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identifi- cation Code	Name of company	Telephone number	Office address
SOR	MW Manufacturers, Inc., Southern Resin Div	919-475-1348	P.O. Box 68, Thomasville, NC 27360.
TZC	Magneslum Elektron, Inc	201-782-5800	500 Point Breeze Road, Flemington, NJ 08822.
MGR	Magruder Color Co., Inc	201-242-1300	1029 Newark Ave., Elizabeth, NJ 07208.
MAL	Mallinckrodt, Inc	314-895-2000	675 McDonnell Blvd., St. Louis MO 63042.
KCH	Manchem, Inc	215-837-1808	275 Keystone Dr., Bethlehem, PA 18017.
MOC	Marathon Petroleum Co., Texas Refining Div	419-422-2121	539 S. Main St., Findlay, OH 45840.
MRV	Marlowe-Van Loan Corp	919-882-3351	1511 Joshua Circle, High Point, NC 27261.
MCA	Masonite Corp., Alpine Resin Div	312-750-0900	P.O. Box 1048, Laurel, MS 39441.
MAX	Max Marx Color Corp	201-373-7801	1200 Grove St., Irvington, NJ 07111.
MYO	Mayo Chemical Co	404-696-6711	5544 Oakdale Rd., Smyrna, GA 30081.
MLC	Melamine Chemicals, Inc	504-473-3121	P. O. Box 748, Donaldsonville, LA 70346.
MRK	Merck & Co., Inc	201-574-4000	P. O. Box 2000, Rahway, NJ 07065.
MER	Merichem Co	713-455-1311	1914 Haden Rd., Houston, TX 77015.
MLS	Miles Laboratories, Inc: Biotechnology Group	219-262-7445	1127 Myrtle St., Elkhart, IN 46515.
MIL	Milliken & Co., Milliken Chemical Div	803-472-9041	P. O. Box 817, Inman, SC 29349.
MMM	Minnesota Mining & Manufacturing Co	612-733-3647	3M Center 224-6S, St. Paul, MN 55144.
MIR	Miranol Chemical Co., Inc	201-329-3900	P. O. Box 436, 68 Culver Rd., Dayton, NJ 08810.
MSC	Mississippi Chemical Corp Mobay Chemical Corp.:	601-746-4131	P. O. Box 388, Yazoo City, MS 39194.
CHG	Agricultural Chemicals Div	816-242-2345	Hawthorne Rd., Kansas City, MO 64120.
VPC	Dye & Pigment Div	201-686-3700	Mobay Road, Pittsburgh, PA 15205.
MOB	Pittsburgh Div	412-777-2000	Mobay Road, Pittsburgh, PA 15205.
DKA	Mobay Synthetics Corp	713-477-8821	8701 Park Place Blvd., Houston, TX 77017.
SM	Mobil Oil Corp.:		
	Gas Liquids Dept	703-849-3000	P. O. Box 900, Dallas, TX 75221.
	Mobil Chemical Co. Polystyrene Business	201-321-6000	P. O. Box 240, Edison, NJ 08818.
	Chemical Products Div	201-321-6000	P. O. Box 250, Edison, NJ 08818.
	Petrochemicals Div	713-590-7700	World Towers One, 15600 Kennedy Blvd., Houston, TX 77032.
MOA	Mona Industries, Inc	201-345-8220	76 E. 24th St., Paterson, NJ 07544.
MON	Monsanto Co	314-694-1000	800 N. Lindbergh Blvd., St. Louis, MO 63167.
MNA	Monsanto Agricultural Co	314-694-1000	800 N. Lindbergh Blvd., St. Louis, MO 63167.
MCI	Mooney Chemicals, Inc	216-781-8383	2301 Scranton Rd., Cleveland, OH 44113.
MCP	Moretex Chemical Products, Inc	803-583-8441	314 W. Henry St., Spartanburg, SC 29304.
MRF	Morfex Chemical Co., Inc	919-292-1781	2110 High Point Road, Greensboro, NC 27403.
MRT	Morton Thiokol, Inc.:		
	Morton Chemical Div	312-807-2000	333 W. Wacker Dr. Chicago, IL 60606.
	Morton Thiokol, Inc		
PYI	Morton Chemical Div	312-807-2000	Mountain Creek Church Rd., Greenville, SC 29602.
CCW	Ventron Div	513-733-2100	2000 West St., Reading, OH 45215.
MHI	Ventron Div	508-774-3100	150 Andover St., Danvers, MA 01923.
MOT	Motomco, Ltd	608-244-2904	P. O. Box 8422, Madison, WI 53708.
RTC	Mount Vernon Mills, Inc	803-233-4151	One Shelter Place, Greenville, SC 29602.
PNX	The Murphy-Phoenix Co	216-831-0404	25800 Science Park Dr., P.O. Box 22930, Beechwood, OH 44122.
NTL	NL Chemicals Div	609-443-2000	P. O. Box 700, Hightstown, NJ 08520.
NTL	NL Industries, Inc	609-443-2000	P. O. Box 700 Hightstown, NJ 08520.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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Identification Code	Name of company	Telephone number	Office address
LEM	Napp Chemicals, Inc	201-773-3900	199 Main St., Lodl, NJ 07644.
NTC	National Caseln Co	312-846-7300	601 W. 80th St., Chlcago, IL 60620.
NCJ	National Caseln of New Jersey	312-846-7300	601 W. 80th St., Chlcago, IL 60620.
NMC	National Milling & Chemical Co., Inc	215-482-6600	4601 Flat Rock Rd., Philadelphia, PA 19127.
NSC	National Starch & Chemical Corp	201-685-5000	10 FINDERNE AVE., BRIDGEWATER, NJ 08807.
NTS	National Steel Corp., Great Lakes Plant	313-297-3000	1 Quality Dr., Ecorse, MI 48229.
NEP	Nepera, Inc	914-782-1200	Route #17, Harriman, NY 10926.
NEV	Neville Chemical Co	412-331-4200	2800 Neville Rd., Pittsburgh, PA 15225.
NBC	New Boston Coke Corp	614-456-4154	600 River Ave., New Boston, OH 45662.
NCC	Niacet Corp	716-285-1474	400 - 47th St., Niagara Falls, NY 14304.
NLO	Niklor Chemical Co., Inc	213-830-2253	2060 E. 220th St., Long Beach, CA 90810.
NCP	Niles Chemical Paint Co	616-683-3377	P. O. Box 307, Niles, MI 49120.
NOC	The Norac Co., Inc Mathe Div	818-334-2908 201-779-4981	405 S. Motor Ave., Azusa, CA 91702. 169 Kennedy Dr., Lodl, NJ 07644-0230.
FSN	NOR-AM Chemical Co	302-575-2000	3509 Silverside Road, Wllmington, DE 19803.
NPC	Northwest Petrochemical Corp.	206-293-3176	P. O. Box 99, Anacortes, WA 98221.
NW	Northwestern Chemical Co	312-231-6111	120 N. Aurora St., West Chicago, IL 60185.
NOR	Norwich Eaton Pharmaceutical, Inc	607-335-2111	17 Eaton Ave., Norwich, NY 13815.
NBI	Novo Biochemical Industries, Inc	919-494-2014	State Road 1003, Franklinton, NC 27525.
NSW	The Nutrasweet Co	312-940-9800	1751 Cook Road, Deerfield, IL 60015.
NUT	Nutrilus, Inc	216-526-5522	8221 Brecksville Rd., Brecksville, OH 44141.
OBC	The O'Brien Corp	415-871-6060	450 E. Grand Ave., S. San Francisco, CA 94080.
	Occidental Chemical Corp.:		
HKD	Durez Div	716-696-6000	Walck Rd., N. Tonawanda, NY 14120.
HKO	Olefins Div	318-437-8100	One Lakeshore Dr., Suite 1895 Lake Charles, LA 70629.
HKP	PVC Div	215-251-1000	P. O. Box 1772, Berwyn, PA 19312.
HK	ED & S Div.	214-404-3300	5005 LBJ Freeway, Dallas, TX 75244.
EPI	Ohlo Rubber Eagle Pitcher Ind Orthane Div.	817-387-0585	P.O. Box 1398, Denton, TX 76202.
OMC	Olin Corp	203-356-2000	120 Long Rldge Rd., Stamford, CT 06904.
WAY	Olin Hunt Specialty Products, Inc.	201-977-6000	One Wellington Rd., Lincoln, RI 02865.
OC	Omega Chemicals, Inc	803-582-5346	P.O. Box 1723, Spartanburg, SC 29304
ORG	Organics/LaGrange, Inc	312-764-6700	7125 N. Clark St., Chlcago, IL 60626.
OCC	Orient Chemical Corp	201-465-0714	121 Tyler St., Port Newark, NJ 07114.
BSW	Original Bradford Soap Works, Inc	401-821-2141	200 Providence St., W. Warwick, RI 02893.
CJO	C. J. Osborn Chemicals, Inc	609-662-0128	820 Sherman Ave., Pennsauken, NJ 08110.
OCF	Owens-Corning Fiberglas Corp	419-248-8000	Fiberglas Tower, Toledo, OH 43659.
PBI	PBI-Gordon Corp	816-421-4070	1217 W. 12th St., Kansas City, MO 64101-9984.
PDG	P.D. Glycol	409-838-4521	P.O. Box 3785, Beaumont, TX 77704.
PSG	PMC Specialities Group, Inc	216-356-0700	20525 Center Ridge Rd, Rocky River, OH 44116.
PMP	PMP Fermentation Products, Inc	414-352-3001	7670 N. Port Washington Rd., Milwaukee, WI 53217.
PPG	PPG Industries, Inc	412-434-3131	One PPG Place, Pittsburgh, PA 15272.
PPS	P/P Splitter Venture	713-972-1307	6161 Savoy Dr. Suite 222, Houston, TX 77036.
PAC	Pacific Anchor Chemical Corp	213-725-1800	5701 S. Eastern Ave. Suite 530, Los Angeles, CA 90040.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
PRA	Para-Chem. Southern Inc	803-967-7691	P.O. Box 127, Simpsonville, SC 29681.
PAH	Parish Chemical Co	801-226-2018	145 N. Geneva Rd., Orem, UT 84057.
PD	Parke-Davis Div., of Warner Lambert, Inc	616-392-2375	188 Howard Ave., Holland, MI 49424.
PSC	Passaic Color & Chemical Co	201-279-0400	28-36 Paterson St., Paterson, NJ 07501.
PAT	Pat-Chem, Inc	803-233-3941	11 Worley Rd., Greenville SC 29602.
CHP	C. H. Patrick & Co., Inc	803-244-4831	P. O. Box 2526, Greenville, SC 29602.
PEL	Pelron Corp	312-442-9100	7847 W. 47th St., Lyons, IL 60534.
PEN	Penick Corp	201-621-2804	158 Mount Olive Ave., Newark NJ 07714
PAS	Pennwalt Corp	215-587-7000	Three Parkway, Philadelphia, PA 19102.
WTL	Lucidol Div	716-877-1740	1740 Military Rd., Buffalo, NY 14240.
PAR	Penreco, Pennzoil Products Co., Div	713-337-1534	4401 Park Ave., Dickinson, TX 77539.
BPT	Permethane Coating, Inc	617-531-1880	13 Corwin St., Peabody, MA 01960.
PST	Perstorp Compounds, Inc	413-584-2472	238 Nonotuck St., Florence, MA 01060.
PST	Perstorp Polyols, Inc	419-729-5448	600 Matzinger Rd., Toledo, OH 43612.
PFN	Pfanstiehl Laboratories, Inc	312-623-0370	1219 Glen Rock Ave., Waukegan, IL 60085.
PCW	Pfister Chemical, Inc	201-945-5400	Linden Ave., Ridgefield, NJ 07657.
PFZ	Pfizer, Inc	212-573-2323	235 E. 42nd St., New York, NY 10017.
	Pfizer Pharmaceuticals, Inc	809-846-4300	P. O. Box 628, Barceloneta, PR 00617.
PHR	Pharmachem Corp	215-867-4654	719 Stefko Blvd., P.O. Box 1035 Bethlehem, PA 18016.
PLB	Pharmacla P-L Biochemicals, Inc	414-225-2600	2202 N. Bartlett Ave., Milwaukee, WI 53202.
PDI	Phelps Dodge Industries, Inc.	219-456-4444	4300 New Haven Ave., Fort Wayne, IN 46803.
	Phelps Dodge Magnet Wire Co. Div.		
PPX	Phillips Paraxylene, Inc	809-864-1515	P. O. Box 1166, Guayama, PR 00655.
PLC	Phillips 66 Co	918-861-6600	Phillips Bldg., Bartlesville, OK 74006.
PPR	Phillips Puerto Rico Core, Inc	809-864-1515	P. O. Box 1166, Guayama, PR 00655.
PHC	Phthalchem, Inc	513-681-0099	266 W. Mitchell Ave., Cincinnati, OH 45232.
PCI	Piedmont Chemical Industries, Inc	919-885-5131	331 Burton Ave., High Point, NC 27261.
PIC	Pierce Chemical Co	815-968-0747	3747 N. Meridian Rd., Rockford, IL 61103.
PIL	Pilot Chemical Co	213-723-0036	11756 Burke St., Santa Fe Springs, CA 90670.
PKL	Plaskolite, Inc	614-294-3281	P. O. Box 1497, Columbus, OH 43216.
PSL	Plaslok Corp	716-681-7755	3155 Broadway, Buffalo, NY 14227.
PLS	Plastics Engineering Co	414-458-2121	3518 Lakeshore Rd., Sheboygan, WI 53081.
PMC	Plastics Manufacturing Co	214-330-8671	2700 S. Westmoreland, Dallas, TX 75233.
PTC	Polycast Technology Corp	203-327-6010	70 Carlisle Pl., Stamford, CT 06902.
PLR	Polysar, Inc Plastics Div	671-537-9901	29 Fuller St., Leominster, MA 01453.
PRT	Pratt & Lambert, Inc	716-873-6000	P.O. Box 22, Buffalo, NY 14240.
JLP	J. L. Prescott Co	201-777-4200	27 8th St., Passaic, NJ 07055.
PCH	Prochem, Inc	215-436-4812	116 Concord MTG. Road, Glen Mills, PA 19342.
PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.	513-627-5194	P. O. Box 599, Cincinnati, OH 45201.
PRC	Products Research & Chemical Corp	818-240-2060	5430 San Fernando Rd., Glendale, CA 91209.
CP	Quaker Chemical Corp	215-828-4250	Elm & Lee Sts., Conshohocken, PA 19428-0809.
EMR	Quantum Chemical Corp.; Quantum Chemical Corp. Emery Div	212-919-5000	11501 Northlake Dr., Cincinnati, OH 19134.
TCH	Emery Div	803-963-4031	P.O. Box 628, Mauldin, SC 29662.
USI	USI Div	513-530-6580	11500 Northlake Dr., Cincinnati, OH 45249.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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Identification Code	Name of company	Telephone number	Office address
QUN	K. J. Quinn & Co., Inc.	617-321-3200	135 Folly Mill Rd., Seabrook, NH 03874.
RSA	R.S.A. Corp	914-693-1818	690 Saw Mill River Rd., Ardsley, NY 10502.
RCN	Racon, Inc	316-524-3245	6040 S. Ridge Rd., Wichita, KS 67201.
BLC	Ranbar Technology, Inc., Ball Chemical Co	412-486-1111	1114 William Flinn Highway, Glenshaw, PA 15116.
RAB	Raytech Corp	203-371-0101	1204 Darlington Ave., Crawfordsville, IN 47933.
RBI	Reeves Brothers, Inc	803-576-1210	P. O. Box 1898, Spartanburg, SC 29304.
REG	Regis Chemical Co	312-967-6000	8210 Austin Ave., Morton Grove, IL 60053.
RCI	Relchhold Chemicals, Inc	914-682-5700	525 N. Broadway, White Plains, NY 10603.
RIL	Reilly Tar & Chemical Corp	317-638-7531	151 N. Delaware St., 1510 Market Square Center, Indianapolis, IN 46204.
RIL	Reilly-Whiteman Inc	215-423-5300	2600 E. Tioga St., Philadelphia, PA. 19134.
REL	Reliance Universal, Inc., Louisville Resins Div	502-459-9110	P.O. Box 37510, Louisville, KY 40232.
REM	Remington Arms Co., Inc	302-774-1000	615 Asylum St., Bridgeport, CT 06601-2190.
ELP	Rexene Products Co	214-450-9000	5005 LBJ Freeway Occidental Tower, Dallas TX 75244.
RDA	Rhone-Poulenc, Inc	201-821-1000	CN 5266 Princeton, NJ 08543-5266.
RCD	Richardson Polymer Corp	203-245-0441	17 Woodland Rd., Madison, CT 06443.
AMS	Ridgway Color Co	513-771-1900	75 Front St., Cincinnati 45215
RIK	Riker Laboratories, Inc. Sub. of 3M Co	818-341-1300	19901 Nordhoff St., Northridge, CA 91324.
RIV	Riverdale Chemical Co	312-754-3330	220 E. 17th St., Chicago Helghts, IL 60411.
ROB	Robeco Chemicals, Inc.	212-986-6410	99 Park Ave., New York, NY 10016.
ORT	Roehr Chemicals, Inc, Div. of Aceto	718-784-8473	52-20 37th St., Long Island City, NY 11101.
RH	Rohm & Haas Co	215-592-3000	Independence Mall West., Philadelphia, PA 19105.
ROM	Roma Color, Inc	617-676-3481	749 Quequechan St., Fall River, MA 02723.
RUC	Rubicon, Inc	504-673-6141	P. O. Box 517, Geismar, LA 70734.
RUO	Ruco Polymer Corp	516-931-8104	New South Rd., Hicksville, NY 11802.
NES	Ruetgers-Nease Chemical Co	814-238-2424	201 Struble Rd., State College, PA 16801.
SBP	SBS Products Inc	517-799-4941	302 Waller St., Saginaw, MI 48605.
SCM	SCM Corp.:		
	Glidco Organics	904-768-5800	P.O. Box 389, Jacksonville, FL 32201
	PCR, Inc	904-376-8246	P.O. Box 1466, Gainesville, FL 32609.
SOS	SSC Industries, Inc	404-762-9651	1550 E. Taylor Ave., East Point, GA 30344.
NPR	Safeway Stores, Inc	415-944-4329	2800 Ygnacio Valley Rd., Walnut Creek, CA 94598.
STX	St. Croix Petrochemical Corp	809-778-6450	P. O. Box 6801, Sunny Isle, St. Croix, U.S. VI 00823-6801.
SLM	Salem Oil & Grease Co	508-745-0585	60 Grove St., Salem, MA 01970.
SAL	Salsbury Laboratories, Inc	515-257-2422	2000 Rockford Rd., Charles City, IA 50616.
SBG	Samuel Bingham Co	312-298-6777	479 Business Center Dr., Suite 109, Franklin Park, IL 60131.
	Sandoz Corp.:		
SCM	Sandoz Chemical Corp	704-331-7016	4000 Monroe Rd., Charlotte, NC 28205.
ZOC	Sandoz Corp. Protection	312-699-1616	1300 E. Touhy Ave., Des Plaines, IL 60018.

Table A-1—Continued

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SCN	Schenectady Chemicals, Inc	518-370-4200	P. O. Box 1046, Schenectady, NY 12306.
SBC	Scher Chemicals, Inc	201-471-1300	Industrial West, Clifton, NJ 07012.
SCH	Scherling Corp	201-298-4000	1011 Morris Ave., Union, NJ 07083.
SCO	Scholler, Inc	215-739-0900	P. O. Box 26968, Philadelphia, PA 19134.
SPR	Scientific Protein Laboratories	608-849-5944	700 E. Main St., Waunakee, WI 53597.
SPA	Scott Paper Co	215-521-5000	P. O. Box 925, Everett, WA 98206.
TXS	Scott Polymers Inc	817-831-3541	3607 N. Sylvania Ave., Fort Worth, TX 76111.
SRL	G. D. Searle & Co	312-982-7000	5200 Old Orchard Rd., Skokie, IL 60077.
BRI	Sedgefield Specialties	919-379-2000	3330 W. Friendly Ave., Greensboro, NC. 27406.
SQA	Sequa Chemicals, Inc	803-385-5181	P.O. Box 70, Chester, SC 29706.
SKP	Shakespeare Monofilament Div	803-754-7011	6111 Shakespeare Rd., Columbia, SC 29240.
SHO	Shell Oil Co	713-241-1242	P. O. Box 3105, Houston, TX 77002.
SHC	Shell Chemical Co	713-241-1242	P. O. Box 3105, Houston, TX 77002.
SGO	Shenango, Inc	412-771-4400	200 Neville Rd., Pittsburgh, PA 15225-1690.
SHP	Shepherd Chemical Co	513-731-1110	4900 Beech St., Cincinnati, OH 45212.
SHX	Sherex Chemical Co., Inc	614-764-6500	5777 Frantz Rd., Dublin, OH 43017.
SW	The Sherwin-Williams Co.:		
SW	Sherwin-Williams Co	216-566-2000	11541 S. Champlain, Chicago, IL 60628.
BAL	Sherwin-Williams Co Consumer Div	216-566-2000 301-625-8284	2802 W. Miller Rd., Garland TX 75041. 2325 Hollins Ferry Rd., Baltimore, MD 21230.
SHT	Shlntech, Inc	713-965-0713	24 Greenway Plaza, Suite 811, Houston, TX 77046.
SMP	J. R. Simplot Co	208-336-2110	P.O. Box 912 Pocatello, ID 83204.
UPF	Sloss Industries	205-254-7801	P.O. Box 5327 Birmingham, AL 35207.
GFS	G. Frederick Smith Chemical Co	614-881-5501	P. O. Box 23214, Columbus, OH 43223.
SK	SmithKline Beckman Corp	215-751-4000	One Franklin Plaza, Philadelphia, PA 19101.
SMO	Smooth-On, Inc	201-647-5800	1000 Valley Rd., Gillette, NJ 07933.
SIO	Sohio Oil Co	419-226-2300	1150 S. Metcalf St., Lima, OH 45804.
SLT	Soltex Polymer Corp	713-522-1781	P. O. Box 1000, Deer Park, TX 77536.
SLC	Soluol Chemical Co., Inc	401-821-8100	Green Hill & Market Sts., W. Warwick, RI 02893.
SAC	Southeastern Adhesives Co	704-754-3493	815 D Virginia St., SW., Lenoir, NC 28645.
SOM	Southland Corp.:		
SWR	Great Meadows Div Southwestern Refining Co., Inc	214-828-7011 512-884-8863	Alphano Rd., Great Meadows, NJ 07838. P. O. Box 9217, Corpus Christi, TX 78469.
SPL	Spaulding Composites Co.,	716-692-2000	310 Wheeler St., Tonawanda, NY 14150.
ASL	SpecialtyChem Products Corp	715-735-9033	2 Stanton St., Marinette, WI 54143.
SOI	Specialty Organics, Inc	818-962-2008	5623 N. 4th St., Irwindale, CA 91706.
IPP	Spectrachem Corp	201-595-8181	200 Sheridan Ave., Paterson, NJ 07512.
TRD	Squibb Manufacturing, Inc	809-852-1255	P. O. Box 609, Humacao, PR 00661.
SCC	Standard Chlorine of Delaware, Inc	201-997-1700	1035 Belleville Turnpike, Kearny, NJ 07032.
STP	Stepan Co	312-446-7500	RR #1, Elwood, IL 60421 and 100 W. Henter Ave., Maywood, NJ 07607.
SC	Sterling Chemicals, Inc	409-942-3360	201 Bay St. South, Texas City, TX 77592-1311.
SD	Sterling Drug, Inc	212-907-2000	2144 E. State St., Trenton, NJ 08619.
SDW	Sterling Organics Div	212-907-2000	90 Park Ave., New York, NY 10016.
SD	Sterling Pharmaceuticals, Inc	212-907-2000	P. O. Box 11247, Barcelonita, PR 00617.
PPL	Sterling Engineered Products	207-784-9111	1 Florite Road, Auburn, ME 04210.
CIN	Stockhausen, Inc	919-378-9393	2408 Doyle St., Greensboro, NC 27406.
IRI	Stuart-Ironside, Inc	312-655-4595	7575 Plaza Court Willowbrook, IL 60521

Table A-1—Continued

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Identification Code	Name of company	Telephone number	Office address
SNA	Sun Chemical Corp., Pigments Div	212-986-5500	411 Sun Ave., Cincinnati, OH 45232.
SUN	Sun Company, Inc	215-977-6358	1801 Market St., Philadelphia, PA 19103.
RAS	Surface Coatings, Inc	617-933-4200	100 Eames St., Wilmington, MA 01887.
JSC & TCC	Sybron Chemical, Inc	609-893-1100	P.O. Box 66, Birmingham Rd., Birmingham, NJ 08011.
INP	Synalr Corp	615-698-8801	2003 Amnicola Hwy., Chattanooga, TN 37406.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	803-585-3661	P. O. Box 5627, Spartanburg, SC 29304.
SRY	Synray Corp	201-245-2600	209 N. Michigan Ave., Kenilworth, NJ 07033.
HFT	Syntex Agribusiness, Inc.,	417-866-7291	P. O. Box 1246, Springfield, MO 65801.
SYP	Synthetic Products Co., Div of Plastic Specialties & Technology	216-531-6010	1000 Wayside Rd., Cleveland, OH 44110.
SYT	Synthron, Inc	704-437-8611	P. O. Box 1111, Morganton, NC 28655.
TEK	Teknor Apex Co	401-725-8000	505 Central Ave., Pawtucket, RI 02861.
TLI	Teledyne Industries, Inc., Teledyne	408-637-3731	3601 Union Rd., Hollister, CA 95024-0006.
TOC	McCormick Selph		
TEN	Tenneco Oil Co Processing & Marketing	713-757-3373	P. O. Box 2511, Houston, TX 77001.
TVA	Tennessee Chemical Co	615-496-3331	1 Ocoee St., Copperhill, TN 37317.
	Tennessee Valley Authority, NFDC, TVA, OACD, Div. of Developmental Production	205-386-3522	Muscle Shoals, AL 35660.
TU	Tenn-USS Chemicals Co	713-884-4400	4403 LaPorte Hwy, Pasadena, TX 77501.
TER	Terra International, Inc	712-277-1340	Terra Centre, 600 - 4th St., Sloux City, IA 51101.
TER	Terra Nitrogen, Inc	712-277-1340	Terra Centre, 600 - 4th St., Sloux City, IA 51101.
TX	Texaco, Inc., Texaco Chemical Co	713-432-3734	4800 Fournace Place, Bellaire, TX 77401.
TSA	Texas Alkyls, Inc	713-479-8411	P. O. Box 600, Deer Park, TX 77536.
TCR	Texas City Refining, Inc	409-945-4451	P. O. Box 1271, Texas City, TX 77592.
TPC	Texas Petrochemicals Corp	713-477-9211	8600 Park Place Blvd., Houston, TX 77017.
TWD	Tonawanda Coke Corp	716-876-6222	P.O. Box A-500 Tonawanda, NY 14151
TRI	Triad Chemical	504-473-9231	P. O. Box 310, Donaldsonville, LA 70346.
TRC	Trimont Chemical	401-333-4100	1224 Mendon Rd., Cumberland, RI 02864
TRO	Troy Chemical Co	201-589-2500	One Avenue L, Newark, NJ 07105.
TUL	Tull Chemical Co., Inc	205-831-1154	P. O. Box 3246, Oxford, AL 36203.
TLC	Twin Lake Chemical, Inc	716-433-3824	520 Mill St., Lockport, NY 14094.
UPM	UOP, Inc	312-391-2000	25 E. Algonguin Road, Des Plaines, IL 60017-5017.
UHL	Paul Uhlisch & Co., Inc	914-478-2000	1 Railroad Ave., Hastings-on-Hudson, NY 10706.
UNG	Ungerer & Co	201-628-0600	4 Bridgewater Lane, Lincoln Park, NJ 07035.
DRL	Unichema Chemical, Inc	201-327-6100	4650 S. Racine Ave., Chicago, IL 60609.
WTH	Union Camp Corp	201-628-9000	875 Harger Street Dover, OH 44622.
NCI	Terpene & Aromatics Div	201-628-2000	P. O. Box 37617, Jacksonville, FL 32236.
UCC	Union Carbide Corp	203-794-3113	P.O. Box 8361, S. Charleston, WVA 25303.
UOC	Union Oil Co. of California	213-977-7746	1201 W. Fifth St., Los Angeles, CA 90017.
UTP	Union Texas Products Corp	713-968-2366	1330 Post Oak Blvd. Houston TX 77252-2120.
USR	Uniroyal Chemical Co., Div	203-573-3886	World Headquarters, Middlebury, CT 06749
UNN	United Aniline Co	617-762-4057	Endicott St., Norwood, MA 02062.
UNO	United Erie, Inc	814-456-7561	438 Huron St., Erie, PA 16502.

Table A-1—Continued

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USB	U.S. Borax & Chemical Corp., U.S.	213-251-5600	3075 Wilshire Blvd., Los Angeles, CA 90010.
USX	U.S. Steel, Div. Of USX:		
	Clairton Plant	412-433-5425	600 Grant St., Pittsburgh, PA 15230.
	Gary Works	219-888-4794	600 Grant St., Pittsburgh, PA 15230.
UTC	Unitex Chemical Corp.	919-378-0965	520 Broome Rd. Greensboro, N.C 27405.
UPJ	The Upjohn Co	616-323-4000	7000 Portage Rd., Kalamazoo, MI 49001
CWN	Fine Chemicals	203-281-2722	410 Sackett Point Rd., North Haven, CT 06473.
VSV	Valentine Sugars, Inc	504-532-2541	Rt 2, Box 625, Lockport, LA 70374.
VLR	Valero Refining Co	512-246-2000	530 McCullough, San Antonio, TX 78215.
VCM	Vanchem, Inc	716-434-2624	1 N. Transit Rd., Lockport, NY 14094.
VDM	Van De Mark Chemical Co., Inc	716-433-6764	1 N. Transit Rd., Lockport, NY 14094.
VNC	Vanderbilt Chemical Corp	203-744-3900	31 Taylor Ave., Bethel, CT 06801
		203-853-1400	and Rt. #2, Box 54, Murray, KY 42071.
VND	Van Dyk, Div. of Mallinckrodt, Inc	201-450-3206	Main & William Sts., Belleville, NJ 07109.
VEL	Velsicol Chemical Corp	312-698-9700	5600 N. River Rd., Rosemont, IL 60018.
VIK	Viking Chemical Co	612-333-0394	838 Baker Bldg., Minneapolis, MN 55402.
VIN	Vineland Chemical Co., Inc	609-691-3535	W. Wheat Rd., Vineland, NJ 08360.
VCC	Vinings Industries, Inc	404-436-1542	3950 Cumberland Pkwy., Atlanta, GA 30339.
VKR	Virkler Co	704-527-2350	1022 Pressley Rd., Charlotte, NC 28210.
VST	Vista Chemical Co	713-531-3200	15990 N. Barker's Landing Rd., Houston, TX 77224.
VTM	Vitamins, Inc	312-861-0700	200 E. Randolph Dr., Chicago, IL 60601.
FRO	Vulcan Materials Co., Chemicals Div	205-877-3000	P. O. Box 7689, Birmingham, AL 35233.
YVN	Vygen Corporation	216-998-1120	Middle Road, Ashtabula, OH 44004.
SWS	Wacker Silicones Corp	517-263-5711	3301 Sutton Rd., Adrian, MI 49221.
WJ	Warner-Jenkinson	314-889-7600	2526 Baldwin St., St. Louis, MO 63106.
WES	Wesley Industries, Inc	205-626-2040	P.O. Box 490, Montrose, AL 36559.
WCA	West Coast Adhesives Co	503-286-3515	11104 NW Front Ave., Portland, OR 97231.
GCC	Western Branch Holding Co	212-819-5500	P.O. Box 27147 Memphis TN 38127.
EW	Westinghouse Electric Corp.,	412-864-7960	Route 993, Manor, PA 15665.
	Insulating Materials Div		
WPG	WestPoint Pepperell, Inc	404-645-4753	1900 Cunningham Dr., Opelika, AL 36801.
WVA	Westvaco Corp	212-688-5000	P. O. Box 70848, Charleston Heights, SC 29415.
WRD	Weyerhaeuser Co	715-384-2141	118 S. Palmetto Ave., Marshfield, WI 54449.
WPS	Wheeling-Pittsburgh Steel Corp	304-234-2439	1134 Market Square Wheeling, W VA 26003.
WCC	White Chemical Corp	201-621-4100	660 Frelinghuysen Ave., Newark, NJ 07114.
WTK	Whittaker Corp., Heico Chemicals Div	717-476-0353	Rt. 611, Delaware Water Gap, PA 18327.
WHW	Whittmore-Wright Co., Inc	617-242-1180	62 Alford St., Boston, MA 02129.
CHN	Wil-Gro Fertilizer, Inc	918-825-3383	P.O. Box 429, Pryor, OK 74362.
WLM	Wilmington Chemical Corp	302-658-3515	Pyles Lane, Wilmington, DE 19899.
WTC	Witco Corp	201-573-2800	155 Tice Blvd., Woodcliff Lake, NJ 07675.
WCL	Wright Corp	919-251-0234	102 Orange, Wilmington, NC 28403.
WYK	Wyckoff Chemical Co., Inc	616-637-8474	1421 Kalamazoo St., S. Haven, MI 49090.
WYC	Wycon Chemical Co	307-637-2700	P. O. Box 1287, Cheyenne, WY 82003.
WYT	Wyeth Laboratories, Inc., Wyeth	215-341-3867	P.O. Box 13745, Philadelphia, PA 19101-3745.
	Laboratories Div. of American Home Products Corp		

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

APPENDIX B
CYCLIC INTERMEDIATES;
GLOSSARY OF SYNONYMOUS NAMES

Table B-1

Cyclic Intermediates: Glossary of synonymous names

Common name	Standard (chemical abstracts) name
A acid	3,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Acetyl-p-phenylenediamine	4'-Aminoacetanilide.
1,2,4-acid	4-Amino-3-hydroxy-1-naphthalenesulfonic acid (1-Amino-2-naphthol-4-sulfonic acid).
Acid yellow 9	6-Amino-3,4'-azobibenzenesulfonic acid.
p-Aminobenzenesulfonic acid	Sulfanilic acid and salt.
m-Aminobenzoyl J acid	4-Hydroxy-7-(m-aminobenzamido)- 2-naphthalenesulfonic acid.
Aminoepsilon acid	8-Amino-1,6-naphthalenedisulfonic acid.
Amino G acid	7-Amino-1,3-naphthalenedisulfonic acid.
Amino J acid	6-Amino-1,3-naphthalenedisulfonic acid.
Amino R salt	3-Amino-2,7-naphthalenedisulfonic acid.
Aniline oil	Aniline.
Anthraflavic acid	2,6-Dihydroxyanthraquinone.
Anthrarufin	1,5-Dihydroxyanthraquinone.
Armstrong & Wynne's acid	4-Hydroxy-2-naphthalenesulfonic acid.
B acid	5-Amino-4-hydroxy-1,7-naphthalenedisulfonic acid.
2B acid	6-Amino-4-chloro-m-toluenesulfonic acid.
4B acid	6-Amino-m-toluenesulfonic acid.
Benzal chloride	α, α -Dichlorotoluene.
Benzanthrone	7H-Benz[de]anthracen-7-one.
Benzotrchloride	α, α, α -Trichlorotoluene.
Bisphenol A	4,4'-Isopropylidenediphenol.
B.O.N.	3-Hydroxy-2-naphthol acid.
Broenner's acid	6-Amino-2-naphthalenesulfonic acid.
Bromamine acid	1-Amino-4-bromo-2-anthraquinonesulfonic acid.
Bromobenzanthrone	3-Bromo-7H-benz[de]anthracen-7-one.
C acid	3-Amino-1,5-naphthalenedisulfonic acid.
C.A. acid	3-Amino-6-chloro-4-sulfobenzolc acid.
C-Amine (Lake Red C acid)	2-Amino-5-chloro-p-toluenesulfonic acid.
Cassella acid	5-Hydroxy-1-naphthalenesulfonic acid.
Chicago Acid (SS acid)	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Chlorobenzanthrone	Chloro-7H-benz[de]anthracen-7-one.
Chromotropic acid	4,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Chrysazin	1,8-Dihydroxyanthraquinone.
1,6-Cleve's acid	5-Amino-2-naphthalenesulfonic acid.
1,7-Cleve's acid	8-Amino-2-naphthalenesulfonic acid.
Crocein acid	7-Hydroxy-1-naphthalenesulfonic acid.
2-Cyanopyridine	Picolinonitrile.
3-Cyanopyridine	Nicotinonitrile.
Cyanuric chloride	2,4,6-Trichloro-s-triazine.
D acid	6-Amino-1-naphthalenesulfonic acid.
DADI	Dianilsidine diisocyanate.
DDB	p-Dibutoxybenzene.
Decacyclene	Diacenaphtho[1,2-]:1',2'-]fluoranthene.
Dehydrothlo-p-toluidine	2-(p-Aminophenyl)-6-methylbenzothiazole.
Developer Z	3-Methyl-1-phenyl-2-pyrazolin-5-one.
o-Dianilsidine	3,3'-Dimethoxybenzidine.
1,1'-Dianthrime	1,1'-Iminodianthraquinone.
Dibenzanthrone	Violanthrone.
Dichlone	2,3-Dichloro-1,4-naphthoquinone.
4,4'-Dihydroxydiphenylsulfone	4,4'-Sulfonyldiphenol.
Dimethyl POPO	1,4-Bis[2-(4-methyl-5-phenyloxazolyl)]benzene.
4,5-Dinitrochrysazin	1,8-Dihydroxy-4,5-dinitroanthraquinone.
Dioxy S acid	4,5-Dihydroxy-1-naphthalenesulfonic acid.
Diphenyl epsilon aci	6,8-Dianilino-1-naphthalenesulfonic acid.
Durene	1,2,4,5-Tetramethylbenzene.
Epsilon acid (Andresen's acid)	8-Hydroxy-1,6-naphthalenedisulfonic acid.
F acid	7-Hydroxy-2-naphthalenesulfonic acid.
Fast Red G base	2-Nitro-p-toluidine [NH ₂ =1].
Fast Scarlet R base	5-Nitro-o-anilsidine [NH ₂ =1].
Fischer's aldehyde	1,3,3-Trimethyl- ω^2, α -Indolylacetalddehyde.
Fischer's base	1,3,3-Trimethyl-2-methylenelndoline.
Freund's acid	4-Amino-2,7-naphthalenedisulfonic acid.

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

Common name	Standard (chemical abstracts) name
G salt	7-Hydroxy-1,3-naphthalenesulfonic acid, sodium salt.
Gamma acid	6-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
Gold salt	9,10-Dihydro-9,10-dioxo-1-anthracenesulfonic acid and salt.
H acid	4-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid, (8-Amino-1-naphthol-3,6-disulfonic acid).
Hellmellitene	1,2,3-Trimethylbenzene.
Indoxyl	3(2H)-Indolone.
Isodurene	1,2,3,5-Tetramethylbenzene.
J acid	7-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
J acid urea	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid]
K acid	4-Amino-5-hydroxy-1,7-naphthalenedisulfonic acid.
Koch's acid	8-Amino-1,3,6-naphthalenetrilsulfonic acid.
L acid	5-Hydroxy-1-naphthalenesulfonic acid.
Lake Red C amine	2-Amino-5-chloro-p-toluenesulfonic acid.
Laurent's acid	5-Amino-1-naphthalenesulfonic acid.
M acid	8-Amino-4-hydroxy-2-naphthalenesulfonic acid.
MEP	5-Ethyl-2-picoline (2-Methyl-5-ethylpyridine).
Mesitylene	1,3,5-Trimethylbenzene.
Methane base	4,4'-Methylenebis[N,N-dimethylaniline].
Michler's hydrol	4,4'-Bis[dimethylamino]benzhydrol.
Michler's ketone	4,4'-Bis[dimethylamino]benzophenone.
MOCA	3,3'Dichloro-4,4'-diaminodiphenylmethane.
MVP	5-Vinyl-2-picoline.
Naphthionic acid	4-Amino-1-naphthalenesulfonic acid.
o-Naphthionic acid	1-Amino-2-naphthalenesulfonic acid.
β -Naphthol	2-Naphthol, tech
Naphthol AS	3-Hydroxy-2-naphthanilide.
α -Naphthylamine	1-Naphthylamine.
Neville & Winther's acid	4-Hydroxy-1-naphthalenesulfonic acid.
m-Nitrobenzoyl J acid	4-Hydroxy-7-(m-nitrobenzamido)-2-naphthalenesulfonic acid.
Oxy Koch's acid	1-Naphthol-3,6,8-trisulfonic acid.
Pentaanthrimide	1,4,5,8-Tetrakis(1-anthraquinonylamino)anthraquinone.
Perl acid	8-Amino-1-naphthalenesulfonic acid.
Phenylbiphenyl	Terphenyl.
N-Phenyldiethanolamine	2,2'-[(Phenyl)imino]diethanol.
Phenyl gamma acid	6-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl J acid	7-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl perl acid	8-Anilino-1-naphthalenesulfonic acid.
Ploric acid	2,4,6-Trinitrophenol.
POPO	1,4-Bis[2-(5-phenyloxazolyl)]benzene.
Pseudocumene	1,2,4-Trimethylbenzene.
Pyrazoleanthrone	Anthra[1,9-cd]pyrazol-6(2H)-one.
Pyrazoleanthrone yellow	[3,3'-Blanthral[1,9-cd]pyrazole]-6,6'-(2H,2'H) dione.
Pyrazolone T	5-Oxo-1-(p-sulfophenyl)-2-pyrazoline-3-carboxylic acid.
Quinizarin	1,4-Dihydroxyanthraquinone.
2-Quinizarinsulfonic acid	9,10-Dihydro-1,4-dihydroxy-9,10-dioxo-2-anthracenesulfonic acid.
Quinoline yellow base	Quinophtalene.
R salt	3-Hydroxy-2,7-naphthalenedisulfonic acid, disodium salt.
RG acid (Violet acid)	4-Hydroxy-2,7-naphthalenedisulfonic acid.
Rhoduline acid (J Acid Imide)	7,7'-Iminobis[4-hydroxy-2-naphthalenesulfonic acid].
RR acid	3-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid.
S acid	4-Amino-5-hydroxy-1-naphthalenesulfonic acid.
Schaffer's acid	6-Hydroxy-2-naphthalenesulfonic acid.
Silver salt	9,10-Dihydro-9,10-dioxo-2-anthracenesulfonic acid and salt.
Solvent Yellow 1	p-Phenylazoaniline and hydrochloride.
Solvent Yellow 3	4-(o-Tolylazo)-o-tolidine.
SS acid (Chicago acid)	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Sulfanilic acid	p-Aminobenzenesulfonic acid.
o-Sulfobenzaldehyde	o-Formylbenzenesulfonic acid.

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

<i>Common name</i>	<i>Standard (chemical abstracts) name</i>
Tetrafin	1,2,3,4-Tetrahydronaphthalene.
Thiolindoxyl	3(2H)-Thlanaphthenone.
Thiosalicylic acid	o-Mercaptobenzoic acid.
Tobias acid	2-Amino-1-naphthalenesulfonic acid.
TODI	Bitoluene diisocyanate.
o-Tolidine	3,3'-Dimethylbenzidine.
α-Toluic acid	Phenylacetic acid.
α-Tolunitrile	Phenylacetonitrile.
4-m-Tolylenediamine	Toluene-2,4-diamine.
Trimellitic anhydride	1,2,4-Benzenetricarboxylic acid, 1,2-anhydride.
Trimethyl base	1,3,3-Trimethyl-2-methyleneindoline.
Trinitrophenol	Picric acid.
Urea J acid (J acid urea)	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid].
Veratraldehyde	3,4-Dimethoxybenzaldehyde.
Veratrole	o-Dimethoxybenzene.
Vinytoluene	ar-Methylstyrene.
Violet acid (RG acid)	4-Hydroxy-2,7-naphthalenedisulfonic acid.

APPENDIX C
SYNTHETIC ORGANIC CHEMICALS,
U.S. PRODUCTION AND SALES, 1988

Synthetic Organic Chemicals, U.S. Production And Sales, 1988, Harmonized System Basis

The following table contains 1988 U.S. production and sales data for synthetic organic chemicals in the 6-digit Harmonized System (HS) format. The Commission decided to compile such data in this format in response to the decision by the U.S. Bureau of the Census to publish Standard Industrial Classification (SIC) data which will be convertible to the HS beginning with the 1987 *Census of Manufactures*. The U.S. Bureau of the Census has historically referred to the *Synthetic Organic Chemicals, United States Production and Sales (SOC)* report in the chemicals section of the *Census of Manufactures*, which permits them to omit collecting synthetic organic chemicals production and shipments data from its respondents. Because of this situation, the SOC data will now also be compiled on an HS basis to provide comparability with the new SIC format.

The table provides production and sales data on a 6-digit HS basis only where publication would not violate the statutory provisions relating to unlawful disclosure of information accepted in confidence by the Commission. It includes only the 6-digit item numbers with publishable data from a number of HS chapters in which these chemicals are classified, but does not provide totals by chapter or overall total figures.

Table C-1
 Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HSI number	Description	Production	Sales	
		Quantity	Quantity	Value
		Pounds	Pounds	Dollars
151800	Chemically modified fats and oils and their fractions (except those of heading 1516)	138,654,439	134,465,792	72,824,127
220720	Ethyl alcohol and other splrits, denatured, of any strength	561,777,818	437,697,370	133,672,997
290121	Ethylene	37,203,907,797	14,553,625,014	3,690,038,268
290122	Propene (Propylene)	21,223,882,459	13,356,175,552	2,196,937,319
290124	Buta-1,3-diene and Isoprene	3,536,528,693	3,158,886,783	676,894,985
290211	Cyclohexane	2,296,732,194	2,129,326,194	404,722,520
290250	Styrene	8,986,054,509	3,784,920,168	1,622,714,971
290260	Ethylbenzene	21,720,625,678	253,017,233	73,117,745
290270	Cumene	4,454,525,312	2,792,735,171	531,368,624
290311	Chloromethane (Methyl chloride) and chloroethane (Ethyl chloride)	748,923,217	312,163,128	54,620,970
290312	Dichloromethane (Methylene chloride)	504,118,999	515,717,680	91,236,373
290319	Other saturated chlorinated derivs of acyclic hydrocarbons nspf	1,514,606,774	1,486,712,986	368,129,130
290321	Vinyl chloride (Chloroethylene)	9,057,557,198	3,951,461,680	910,800,056
290329	Other unsaturated chlorinated derivs of acyclic hydrocarbons nspf .....	.....	129,592,000	63,881,663
290340	Halogenated derivs of acyclic hydrocarbons containing two or more different halogens	1,281,458,839	1,095,201,919	824,904,092
290410	Hydrocarbon derivs containing only sulfo groups, their salts and ethyl esters	1,108,503,696	389,690,188	189,463,412
290511	Methanol (Methyl alcohol)	8,142,388,050	3,690,341,898	267,879,899
290512	Propan-1-ol (Propyl alcohol) and propan-2-ol (Isopropyl alcohol)	1,604,551,018	1,235,336,697	244,268,472
290513	Butan-1-ol (n-Butyl alcohol)	1,854,125,841	576,523,078	146,453,235
290514	Other butanols nspf	1,403,171,921	184,023,942	42,306,356
290531	Ethylene glycol (Ethanediol)	5,517,250,226	4,406,674,907	1,442,932,615
290532	Propylene glycol (Propane-1,2-diol)	840,460,300	742,898,740	211,714,780
290539	Other acyclic diols, nspf	2,678,665,769	1,886,563,284	1,051,749,684
290542	Pentaerythritol	122,190,521	109,759,170	63,726,376
290549	Other acyclic polyhydric alcohols, nspf	1,068,457,077	1,047,477,545	82,401,308
290550	Halogenated, sulfonated, nitrated or nitrosated derivs of acyclic alcohols .....	.....	7,174,577	11,374,858
290711	Phenol (Hydroxybenzene) and its salts	3,561,310,625	1,575,111,167	599,678,442
290723	4,4'-Isopropylidenediphenol (Bisphenol A, Diphenylpropane) and its salts	1,340,167,118	422,221,000	230,301,000
290919	Other acyclic ethers, and their halo, sulfo, nitro or nitroso derivs	5,042,974,084	4,599,970,116	1,190,299,740
290941	2,2'-Oxydiethanol (Diethylene glycol, Digol)	563,032,621	464,241,634	166,318,175
290942	Monomethyl ethers of ethylene glycol or of diethylene glycol	89,284,563	81,435,212	34,812,880
290943	Monobutyl ethers of ethylene glycol or of diethylene glycol	391,528,767	350,531,036	139,840,785
290949	Other ether-alcohols and their halo, sulfo, nitro or nitroso derivs nspf	595,080,739	504,691,565	303,663,046
290960	Alcohol-, ether- and ketone peroxides and their halo, sulfo, nitro or nitroso derivs	86,840,728	48,838,030	56,660,744
291010	Oxirane (Ethylene oxide)	5,952,699,341	647,723,371	247,067,071
291211	Methanal (Formaldehyde)	6,280,451,587	1,691,683,070	144,045,994
291213	Butanal (Butyraldehyde, normal Isomer)	1,775,674,320	59,852,650	11,724,279
291230	Aldehyde-alcohols	4,204,829	2,260,084	13,056,388
201411	Acetone	2,302,846,617	1,526,583,166	241,679,664
291412	Butanone (Methyl ethyl ketone)	482,027,800	424,337,380	166,627,546
291413	4-Methylpentan-2-one (Methyl isobutyl ketone) ..	205,312,587	158,713,847	59,546,940
291422	Cyclohexanone and methylcyclohexanones	1,057,281,430	157,001,669	75,462,556
291423	Ionones and methylionones	1,404,245	947,593	8,878,920
291430	Aromatic ketones without other oxygen function ..	4,993,047	.....	.....
291521	Acetic acid	3,159,457,529	783,753,019	131,912,527
291522	Sodium acetate	49,178,184	.....	.....
291531	Ethyl acetate	254,348,403	191,302,922	59,323,731

Table C-1—Continued
 Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HSI number	Description	Production	Sales	
		Quantity	Quantity	Value
		Pounds	Pounds	Dollars
291532	Vinyl acetate	2,561,433,647	1,184,161,902	439,093,727
291533	n-Butyl acetate	192,845,313	159,826,736	59,242,439
291534	Isobutyl acetate	83,418,847	55,435,717	17,849,794
291539	Other esters of acetic acid nspf	230,256,928	198,530,309	129,157,818
291570	Palmitic acid, stearic acid, their salts and esters	242,043,587	220,024,874	159,306,365
291590	Other saturated acyc monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids; halo, sulfo, nitro, nitroso derivs nspf	882,424,122	347,132,133	235,499,751
291615	Oleic, linoleic or linolenic acids, their salts and esters	121,102,512	.....	.....
291619	Other unsaturated acyc monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso deriv	81,733,450	104,829,291	48,699,825
291620	Cyclanic, cyclic, or cycloterpenic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and their derivs	89,681,838	80,640,888	121,568,856
291631	Benzoic acid, its salts and esters	151,955,205	90,939,518	44,669,979
291639	Other aromatic monocarboxylic acids, their anhydrides halides, peroxides, peroxyacids and their derivs nspf	42,777,574	36,642,143	148,687,502
291719	Other acyc, polycarboxylic acids, their anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro or nitroso derivs	646,140,652	495,873,922	288,026,174
291732	Dioctyl orthophthalates	344,267,839	352,576,046	141,617,490
291735	Phthalic anhydride	998,514,730	575,017,690	167,669,299
291739	Other aromatic polycarboxylic acids, their anhydrides halides, peroxides, peroxyacids nspf and their derivs	4,589,427,585	1,433,876,628	554,696,986
291819	Other carbox. acids w/add alcohol function only, anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso derivs	23,667,124	29,831,418	27,957,208
291822	O-Acetylsalicylic acid (Aspirin), its salts and esters	23,693,107	.....	.....
291829	Other carboxylic acids w/add phenol funct only, anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso derivs	4,415,032	4,140,368	13,265,898
291830	Other carboxylic acids with add aldehyde or ketone function only, anhydrides, halides, peroxides, peroxyacids nspf; halo, etc. derivs	964,575,563	.....	.....
291890	Other carboxylic acids w/add oxygen function, anhydrides, halides, peroxides, peroxyacids nspf; halosulfo, nitro, nitroso derivs	117,613,553	90,048,567	179,994,596
291900	Phosphoric esters and their salts, incl. lactophosphates; their halo, sulfo, nitro, nitroso derivs	162,681,638	137,582,273	150,482,772
292010	Thiophosphoric esters (phosphorothioates), their salts; their halo, sulfo, nitro, nitroso derivs	108,430,036	78,815,367	155,142,372
292090	Other esters of inorg. acids (excl. esters of hydrogen halides) nspf, their salts; halo, sulfo, nitro, nitroso derivs	226,889,100	145,370,549	141,424,118
292119	Other acyclic monoamines and their derivs nspf; salts thereof	270,599,316	241,903,075	164,950,145
292129	Other acyclic polyamines and their derivs nspf; salts thereof	170,218,922	133,978,622	138,525,594
292130	Cyclanic, cyclic, cycloterpenic mono- or polyamines and their derivs; salts thereof	37,847,022	34,589,160	51,170,722
292141	Aniline and its salts	1,029,188,988	677,900,181	182,154,277
292211	Monoethanolamine and its salt	208,113,809	138,032,210	54,142,321
292212	Diethanolamine and its salts	184,588,355	153,107,300	59,453,398
292213	Triethanolamine and its salts	212,572,379	185,065,236	79,348,418
292219	Other amino-alcohols nspf, their ethers and esters, containing only one kind of oxygen function; salts thereo	120,895,104	100,196,524	118,411,147
292229	Other amino-naphthols and amino-phenols nspf, their ethers, esters, containing only one kind of oxygen function; salts thereof	11,801,099	.....	.....

Table C-1—Continued
Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HSI number	Description	Production		Sales	
		Quantity	Quantity	Quantity	Value
		Pounds	Pounds	Pounds	Dollars
292230	Amino-aldehydes, amino-ketones and amino-quinones, containing only one kind of oxygen function; salts thereof	169,775	.....	.....	.....
292249	Other amino-acids nsf and their esters, containing only one kind of oxygen function; salts thereof	100,258,929	71,276,002	106,126,366	
292250	Amino-alcohol-phenols, amino-acid-phenols and other amino-compounds with oxygen function ..	62,884,927	22,837,303	62,270,504	
292390	Other quaternary ammonium salts and hydroxides nsf	62,056,091	47,599,838	59,336,616	
292421	Ureines and their derivs; salts thereof	36,009,978	28,450,397	98,118,634	
292519	Other imides nsf and their derivs; salts thereof	10,990,011	8,248,198	25,523,443	
292520	Imines and their derivs; salts thereof	202,457,143	147,451,138	113,118,077	
292690	Other nitrile-function compounds nsf	5,082,767,837	1,860,319,319	872,778,247	
292700	Diazo-, azo-, or azoxy-compounds .....	.....	16,774,840	62,838,749	
292800	Organic derivs of hydrazine or of hydroxylamine ..	1,304,498	.....	.....
292910	Isocyanates	1,764,651,758	1,471,400,708	1,306,770,212	
292990	Other compounds nsf with other nitrogen functions	157,896,878	51,169,468	38,641,971	
293020	Thiocarbamates and dithiocarbamates	102,951,611	85,786,604	187,239,586	
293090	Other organo-sulfur compounds nsf	832,189,269	365,301,614	403,898,318	
293100	Other organo-inorganic compounds	591,499,766	178,382,395	1,053,198,175	
293211	Tetrahydrofuran	93,804,295	.....	.....
293229	Other lactones nsf with oxygen hetero-atom(s) only	112,503,862	24,675,210	78,650,783	
293339	Other heterocyclic cmpds with nitrogen hetero-atom(s) only nsf, with unfused pyridine ring (hydrogenated or not) in structure	115,595,121	86,138,883	573,390,015	
293359	Heterocyclic cmpds w/nitrogen hetero-atom(s) only, pyrimidine (hydrogenated or not) or piperazine ring in struct; nucleic acids, salts ...	29,937,475	17,096,245	100,869,251	
293369	Other heterocyclic cmpds w/nitrogen hetero-atom(s) only nsf, with unfused triazine ring (hydrogenated or not) in the structure	404,063,138	190,688,043	524,208,636	
293371	6-Hexanelactam (epsilon-Caprolactam)	1,261,264,500	367,583,340	234,494,953	
293390	Other heterocyclic compounds with nitrogen hetero atom(s) only nsf	561,253,991	618,025,346	269,867,446	
293420	Heterocyclic compounds containing a benzothiazole ring-system (hydrogenated or not), not further fused	107,953,125	62,866,761	149,896,229	
293490	Other heterocyclic compounds nsf	113,401,867	69,976,347	293,754,819	
320411	Disperse dyes and preparations based thereon ...	30,064,000	21,874,000	99,689,000	
320412	Acid dyes, premetallized or not, mordant dyes and preparations based thereon	17,779,000	15,372,000	75,338,000	
320413	Basic dyes and preparations based thereon	13,846,000	12,591,000	72,575,000	
320414	Direct dyes and preparations based thereon	41,616,000	40,053,000	98,134,000	
320419	Other synth. organic coloring matter nsf and preparations based thereon, incl mixtures of items of subheadings 3204.11 thru 3204.19 ...	49,501,018	42,111,274	152,112,750	
320420	Fluorescent brightening agents	77,381,000	69,813,000	102,062,000	
380610	Rosin	167,195,752	135,165,799	49,516,785	
380630	Ester gums	157,895,911	151,253,469	107,533,524	
381230	Antioxidizing preps and compound stabilizers for rubber or plastics	50,499,813	37,183,412	59,171,524	
381590	Reaction initiators, reaction accelerators, and catalytic preps, nsf	76,766,375	15,056,807	36,710,873	
390110	Polyethylene having a specific gravity of less than 0.94	9,779,232,283	9,013,356,207	4,461,043,828	
390120	Polyethylene having a specific gravity of 0.94 or more	8,915,094,805	8,681,505,152	4,084,365,735	
390210	Polypropylene	7,256,768,000	5,896,665,000	2,819,374,000	
390311	Polystyrene, expandable	551,150,393	554,639,629	370,750,263	
390319	Polystyrene, other than expandable	5,245,970,156	4,206,629,410	2,511,599,002	

Table C-1—Continued

Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HS/ number	Description	Production		Sales
		Quantity	Quantity	Value
		Pounds	Pounds	Dollars
390330	Acrylonitrile-butadiene-styrene (ABS) copolymers	1,929,284,427	1,860,178,304	1,713,024,939
390390	Other polymers of styrene nspf, in primary forms	1,218,465,735	1,051,787,934	1,328,218,368
390410	Polyvinyl chloride, not mixed with any other substances	8,588,205,000	7,798,405,000	3,224,604,000
390461	Polytetrafluoroethylene (PTFE)	18,095,300	24,604,289	141,645,097
390511	Polymers of vinyl acetate in aqueous dispersion ..	675,099,114	650,203,029	355,506,001
390590	Polymers of vinyl esters nspf, in primary forms; other vinyl polymers nspf, in primary forms	788,170,000	672,227,841	466,754,223
390730	Epoxide resins	943,506,512	690,129,633	799,388,805
390750	Alkyd resins	760,215,721	505,122,657	297,306,357
390791	Other polyesters nspf, unsaturated, in primary forms	1,526,896,732	1,451,234,521	873,099,482
390799	Other polyesters nspf, saturated, in primary forms	734,084,628	588,313,268	724,854,920
390810	Polyamide-6, -11, -12, -6,6, -6,9, -6,10 or -6,12 (nylon type)	3,031,086,000	.....	.....
390910	Urea resins; thiourea resins	2,501,953,000	2,193,507,427	249,766,561
390920	Melamine resins	252,628,000	214,052,000	192,428,000
390940	Phenolic resins	1,681,318,000	1,163,568,000	773,490,000
390950	Polyurethanes	273,029,216	204,071,591	324,167,764

APPENDIX D
ALPHABETICAL CHEMICAL INDEX

Alphabetical Chemical Index

The alphabetical index of chemicals contained in this appendix table is an outgrowth of the processing of data by the U.S. International Trade Commission for its annual report, *Synthetic Organic Chemicals, United States Production and Sales*. This index will aid those who have an interest in the report, either as users of the published data or as suppliers of individual company data to the Commission, principally by showing the section number and line item number of specific chemicals. This information can be used to assist in locating a chemical in the report and to provide respondents to the Commission's questionnaire with information on where to list their production and sales data. The index shows only those chemicals for which production or sales were reported to the Commission for this edition of the report.

The index, initially designed for Commission use in computer processing of data for the annual report, has certain characteristics that should be noted to increase its usefulness. For example, superior headings for individual entries are not shown in the index. Thus, understanding the contents of the first item in the index, "accelerators, activators, and vulcanizing agents, acyclic, *other*," necessitates that the index user turn to the individual section (in the report) and item number (in the questionnaire) to find those acyclic accelerators, activators, and vulcanizing agents already specified. Similarly, the index entry "specific gravity 0.940 and below" does not by itself identify the chemical product. The index user will need to turn to the indicated section number and item number to determine the chemical referred to—in this case, polyethylene.

The chemical names used in this report and in the questionnaires sent to U.S. producers to obtain the data aggregated in the report are listed alphabetically in the first column of each listing in the index. The second column refers to the section in the report and questionnaire containing the chemical, and the third column shows the appropriate item number in that section in the questionnaire.

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Acid Orange 152	04 65 152	Acid Yellow 198	04 37,000
Acid Orange 156	04 65 156	Acid Yellow 200	04 37,200
Acid Orange 161	04 65 161	Acid Yellow 219	04 37,219
(Acid Red 26)	05 214 000	Acid Yellow 226	04 24,096
Acid Red 1	04 67 000	Acid Yellow 239	04 37,239
Acid Red 4	04 68 000	Acid Yellow dyes, all other	04 38,000
Acid Red 14	04 69 000	Acromethazone	06 648,100
Acid Red 18	04 71 000	Acrolein (Acrylaldehyde)	05 783,000
Acid Red 57	04 79 000	Acrylamide-2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	14 395,000
Acid Red 73	04 81 000	Acrylamide-acylic acid copolymer, potassium salt	14 397,500
Acid Red 85	04 83 000	Acrylamide-acylic acid copolymer, sodium salt	14 399,000
Acid Red 87	04 84 000	Acrylamide N-dimethylaminomethylacrylamide copolymer	14 399,000
Acid Red 88	04 85 000	Acrylamide monomer	15 228,000
Acid Red 97	04 87 000	Acrylamide-trimethylaminoethyl acrylate chloride polymer	14 399,500
Acid Red 114	04 92 000	Acrylamide-trimethylaminoethyl methacrylate chloride	14 400,000
Acid Red 137	04 94 000	Acrylate-alkyd copolymer resins	08 1,900
Acid Red 139	04 97 000	Acrylic acid	15 491,000
Acid Red 151	04 99 000	Acrylic monomers, mixed	15 884,000
Acid Red 174	04 100 174	Acrylonitrile-butadiene-styrene (ABS) terpolymer resins	08 42,000
Acid Red 182	04 103 000	Acrylonitrile, monomer	15 433,000
Acid Red 186	04 105 000	Acyclic amphoteric surface-active agents, all other	12 19,000
Acid Red 226	04 110 226	Acyclic herbicides	13 212,000
Acid Red 266	04 111 296	Acyclic insecticides, all other	13 231,000
Acid Red 296	04 112 000	Acyclic peroxides, all other	15 1296,550
Acid Red 299	04 114 000	Acyclic plasticizers, all other	11 130,000
Acid Red 337	04 115 364	Acyclovir	06 186,800
Acid Red 364	04 115 384	Acyclic elastomers, all other	10 22,000
Acid Red 384	04 115 388	Adamantane	03 1551,500
Acid Red 388	04 115 396	Adipic acid	15 492,000
Acid Red 396	04 115 396	Adipic acid, ammonium salt	15 613,000
Acid Red 410	04 115 410	Adipic acid, crosslinked polyacrylamide	14 405,000
Acid Red dyes, all other	04 116 000	Adipic acid-diethylene triamine condensate	15 269,810
Acids, acid anhydrides, and acyl halides, all other	15 586,000	Adipic acid-diethylenetriamine-epichlorohydrin polymer	14 153,000
Acid Violet 3	04 118 000	Adipic acid esters, all others	11 66,000
Acid Violet 7	04 119 000	Adipic acid, sodium salt	11 131,100
Acid Violet 12	04 120 000	Adipic acid type complex linear polyesters and polymeric plasticizers	15 613,300
Acid Violet 17	04 121 000	Adiponitrile	15 434,000
Acid Violet 49	04 126 000	β -Alanine-N-[2-(hydroxyethyl)-N-21-[oxococoyl]amino]ethyl, sodium salt	12 447,800
(Acid Yellow 23)	05 204 023	Albumin	06 574,800
Acid Yellow 3	04 6 000	Albuterol sulfate	06 323,000
Acid Yellow 17	04 8 000	C ₁₂ -C ₁₈ Alcohol esters of lactic acid	15 884,600
Acid Yellow 23	04 11 000	C ₁₂ -C ₁₈ Alcohol, ethoxylated, propoxylated and phosphated	12 76,150
Acid Yellow 34	04 12 000	Alcohol mixtures, other	15 883,400
Acid Yellow 36	04 17 000	Alcohol mixtures, C ₁₁ or lower only	15 883,100
Acid Yellow 49	04 19 000	Alcohol mixtures, C ₁₂ through C ₁₈ only	15 883,200
Acid Yellow 59	04 21 000	Alcohol mixtures, C ₁₉ and higher	15 1425,000
Acid Yellow 65	04 22 000	Alcohols, monohydric, and their esters, C ₆ and higher	15 91,000
Acid Yellow 75	04 24 087	Alcohols and phenols, alkoxylated and phosphated or polyphosphated, all other	12 870,000
Acid Yellow 87	04 25 000	Alcohols unmixed C ₁₁ or lower, all other	03 21,400
Acid Yellow 99	04 29 000		
Acid Yellow 127	04 31 000		
Acid Yellow 129	04 32 000		
Acid Yellow 135	04 33 000		
Acid Yellow 151	04 34 000		
Acid Yellow 159	04 35 000		
Acid Yellow 174	04 35 000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Aldehyde and acetone-amine reaction products, cyclic, other	09	Ally cyclohexyl propionate	93,560
Aldehyde-amine reaction products, cyclic, other	08	4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	07
Aldehydes, acyclic, all other	13	Allyl disulfide	07
Aliphatic hydrocarbon sulfides	14	Allyl heptanoate	07
Alkanolamine condensates, all other	14	Allyl hexanoate	07
Alkene thiophosphate	12	Allyl methacrylate	15
Alkyl succinimide	14	4-Allyl-2-methoxyphenol (Eugenol)	07
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	13	4-Allyl-2-methoxyphenol acetate (Eugenol acetate)	15
Alkoxy triaryl titanate	08	1-(Allyloxy)-2,3-epoxypropane (Allyl glycidyl ether)	15
Alkyl phenol	02	3-Allyloxy-2-hydroxypropane sulfonic acid, sodium salt	15
Alkyd copolymers all other	08	Allyl resins	12
Alkylalcohol ethoxylated and carbonated, sodium salt	12	Alpha sulfonate, sodium salt	02
2-(C ₁₂₋₁₈ Alkyl)-1-(C ₁₄₋₁₈ amidoethyl)(4,5-dimydro-3-methyl)imidazolium, methyl sulfate	12	Alpha olefins, C ₈ -C ₁₀	02
N-alkylamine bismethylenephosphonic acid	14	Alpha olefins, C ₁₁ and higher	02
Alkyl C ₈ -C ₁₀ amine hydrochloride	15	Aluminum acetate	15
N-alkylaminobismethylene phosphonic acid salts	14	Aluminum acetylacetonate complex	15
Alkyl aromatics all other	09	Aluminum chlorohydroxyphthalocyanine blue	03
Alkylaryl-p-phenylenediamines	02	Aluminum diisopropoxide acetoacetic ester chelate	15
Alkylaryl phosphites mixed	09	Aluminum distearate	15
Alkylbenzene straight-chain (Except dodecyl and tridecyl)	03	Aluminum 2-ethylhexanoate	15
t- α -Alkylcarboxylic acid salts (Isocarboxylic acid salts), all other	15	Aluminum ethyl-3-oxobutanoate-01, β -dihydroxy T-4	15
Alkyl dimethyl amine oxide	12	Aluminum isooctoxide, diisopropoxide	15
Alkyl glycidyl ethers, C ₁₂ -C ₁₄	15	Aluminum isopropoxide (Aluminum isopropylate)	15
Alkyl glycidyl ethers, C ₉ -C ₁₀	15	Aluminum monoacrylate	15
Alkyl imidazoline	14	Aluminum octanoate	15
N-alkyl-1-naphthylmethyl Ammonium Chloride	12	Aluminum phenolsulfonate	06
3-(C ₁₂₋₁₈ alkyloxy)-1-propanamine	12	Aluminum tri-sec-butoxide	15
N-(C ₁₂₋₁₈ alkyl)oxypropyl trimethylene diamine	12	Aluminum trisearate	15
Alkylphenol formaldehyde condensate, alkoxylated	12	Amantadine hydrochloride	06
Alkylphenol-formaldehyde condensates, alkoxylated, all other	15	Amides, all other	15
Alkylphenols	14	Amidoamines	15
Alkylpyridines, mixed	03	Amido amine salts as curing agents	15
Alkyl succinic anhydride	03	Amidolide hydrochloride	06
Alkyl succinimide	14	Amine oxides and oxygen-containing amines (Except those with amide linkages), cyclic, all other	12
Alkyl terephthalate	14	Amine salts (not containing oxygen), all other	15
All other acyclic flavor and perfume materials	07	Amine salts of fatty, rosin, and tall oil acids, all other	12
All other benzoid or naphthalenoid chemicals	07	4-Aminoacetanilide (Acetyl-p-phenylenediamine)	03
All other dyes	04	3-Amino-p-acetanilide	03
All other octanoic acid esters	11	Amino acids and salts, cyclic, all other	14
All other octanoic acid esters	07	3-Amino-p-ansanilide	03
Allo-ocimene	06	1-Aminoanthraquinone and salt	03
All other products from petroleum and natural gas, cyclic	02	p-Aminobenzamide	03
All other succinic anhydride derivatives	15	1-Amino-4-benzamidoanthraquinone	03
All other terpenoid, heterocyclic, or allylic flavor and perfume chemicals	07	3-Aminobenzamide	03
Allyl alcohol	15	o-Aminobenzamide	03
Allylamines	15	p-Aminobenzoic acid, tech.	03
p-Allylanisole	07	2-Amino-6-benzothiazolesulfonic acid	03
Allyl n-butyl trithiocarbonate	14	1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	03
		7-Aminocephalosporanic acid	03
			64,500

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
2-Amino-5-chloro-4-ethylbenzene	03 76.000	p-[[[p-(Aminophenyl)azo]benzenesulfonic acid	03 188.000
2-Amino-5-chloropyridine	03 81.500	7-[[[4-(Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	03 189.000
6-Amino-5-chloro-m-toluenesulfonic acid [SO ₃ H=1] (2B Acid)	03 83.000	1-(3-Aminopropyl)morpholine	15 6.000
6-Amino-2,4-dichloro-3-methylphenol	03 85.400	Aminosalicylic acid	06 142.000
4-Amino-N,N-di[β-(hydroxyethyl)aniline sulfate	03 91.503	2-Aminothiazole nitrate	03 202.000
Amino dimethyl butyricnitrile	15 434.400	4-Amino-m-toluenesulfonic acid [SO ₃ H=1]	03 203.000
4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	13 40.600	6-Amino-3,5-trichloropicolinic acid (Picloram)	13 41.000
2-Aminoethanol hydrochloride	15 309.900	Ammonium acetate	06 525.000
2-Aminoethanol (Monoethanol amine) sulfate	15 310.000	Ammonium benzoate	15 588.000
Aminoethoxyethanol	15 311.000	Ammonium citrate	15 9.100
(2-Aminoethylamino) ethanol (Aminoethyl ethanolamine)	15 312.000	Ammonium formate	15 621.000
octadecanoic acid	15 312.500	Ammonium heparin	06 647.400
N-Aminoethylaminopyridyl trimethoxysilane	15 3178.450	Ammonium isovalerate	07 127.300
(2-Aminoethyl) ethyl hydrocrogenated (allow alkyl) [2-hydroxyethyl) ammonium ethyl sulfate	12 448.000	Ammonium lactate	15 672.900
2-Aminoethyl mercaptoacetate (Monoethanolamine thioglycolate)	15 313.000	Ammonium mercaptoacetate	15 691.000
1-(2-Aminoethyl)-2-naphthyl-2-imidazole	12 404.450	Ammonium oxalate	15 722.000
1-(2-Aminoethyl)-2-nor(tall oil alkyl)-2-imidazole	12 406.000	Ammonium oxydiethylenebis (alkyl* dimethyl chloride)	13 245.022
1-(2-Aminoethyl)piperazine	15 5.000	Ammonium phenolsulfonate	06 553.000
1-(2-Aminoethyl)piperazine, technical	15 5.000	Ammonium polyacrylate	14 426.000
2-Amino-2-ethyl-1,3-propanediol	15 314.000	Ammonium stearate	15 749.000
N-2-(4-Amino-N-ethyl-m-toluidino) ethyl methane-sulfonamide	14 318.000	Amobarbital	06 443.000
Aminoquinidine hydrochloride	15 315.020	Amoxapine	06 444.000
Aminopurific acid	06 574.900	Amoxicillin (trihydrate)	06 9.600
2-Amino-2-(hydroxymethyl)-1,3-propanediol Tris (hydroxyethyl) aminomethane	15 316.000	Amoxicillin (anhydrous)	06 9.500
4-Amino-5-methoxy-1,3,4-thiadiazole	14 320.000	Amphotericin B	06 1.000
2-Amino-5-methoxy-2-methylbenzenesulfonic acid	03 116.803	Ampicillin (anhydrous)	06 10.000
m-[(4-Amino-3-methoxyphenyl)azo] benzenesulfonic acid	03 118.000	Ampicillin (trihydrate)	06 11.000
3-[[[4-Amino-3-methoxy-5-(ethyl)azo]-1,5-naphthalenedisulfonic acid	03 123.000	Ampicillin, sodium	06 166.000
2-Amino-2-methyl-1,3-propanediol	15 317.000	Amprilium	06 166.000
2-Amino-2-methyl-1,3-propanediol	15 319.000	Amryl acetate (n-Pentyl acetate)	15 888.000
2-Amino-2-methylpropyl 8-bromothioephylillate	03 130.100	Amryl alcohol primary	15 844.100
2-Amino-4-methylpyridine	03 133.550	Amrylases, all ether	14 98.000
2-Amino-5-methylpyridine	03 135.600	Amryl cinnamyl aldehyde dimethyl acetal	07 5.660
2-Amino-4-methylpyrimidine (2-Amino-4-methyl-1,3-diazine)	03 135.000	Amryl cinnamyl acetate	07 93.900
3-Amino-2,7-naphthalenedisulfonic acid	03 143.000	Amryl cyclohexyl acetate	07 1016.500
(4-Amino-2-nitroanilino) ethanol	03 159.890	Amryl hydrogen phosphate	15 1283.100
2-[[[4-Amino-4-nitrophenyl] amino]-2-hydroxymethyl-1,3-propanediol	03 175.000	Amryl ortho- and para- dimethylamino benzoates	15 8.002
2-Amino-5-nitrothiazole	03 176.200	p-Amylphenol	15 8.000
2-Amino-4-nitrotoluene hydrochloride	03 178.400	Amylphenol-formaldehyde, alkoxylated	12 721.500
3-Amino-2-oxazolidione	03 181.000	Amylphenols, mixed isomers	03 212.500
Benzenesulfonic acid	03 182.000	p-tert-Amylphenol sulfide (Tackifier)	07 124.000
p-Aminophenol	03 186.000	Amyris acetate	07 93.650
		Anabolic agents and androgens, all other	06 644.001
		Androstenedione	06 848.000
		Amylhydride-acid mixture	15 492.500
		Amylhydrosorbitol dioleate	12 589.000
		Amylhydrosorbitol esters, all other	15 603.000
		Amylhydrosorbitol monoester of tall oil acids	12 590.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Anhydrosorbitol monolaurate	591,000	Azolic Coupling Component 7	301,000
Anhydrosorbitol mono-oleate	592,000	Azolic Coupling Component 12	305,000
Anhydrosorbitol monopalmitate	593,000	Azolic Coupling Component 14	307,000
Anhydrosorbitol monostearate	594,000	Azolic Coupling Component 17	310,000
Anhydrosorbitol sesquileate	596,000	Azolic Coupling Component 18	311,000
Anhydrosorbitol sesquistearate	596,500	Azolic Coupling Component 20	313,000
Anhydrosorbitol triester of tall oil acids	599,000	Azolic Coupling Component 21	314,000
Anhydrosorbitol trioleate	600,000	Azolic Coupling Component 29	316,000
Anhydrosorbitol tristearate	602,000	Azolic Coupling Component 34	317,000
Aniline (Aniline oil)	612,000	Azolic Coupling Component 43	319,000
Aniline, ethoxylated	615,200	Azolic Diazo Component 5, base	257,000
2-Anilinoethanol	542,200	Azolic Diazo Component 13, base	262,000
Anilinoethanesulfonic acid and salt	315,000	Azolic Diazo Component 32, base	265,000
p-Anilinophenol	619,000	Azolic Diazo Component 1, salt	271,000
Animal grease, sodium salt	66,000	Azolic Diazo Component 3, salt	273,000
Anionic surface-active agents, all other	52,100	Azolic Diazo Component 5, salt	275,000
o-Anisalddehyde (o-Methoxybenzaldehyde)	320,000	Azolic Diazo Component 8, salt	278,000
o-Anisidine	5,950	Azolic Diazo Component 9, salt	278,000
Anisalddehyde bisulfite	6,000	Azolic Diazo Component 10, salt	279,000
o-Anisidomethanesulfonic acid	9,000	Azolic Diazo Component 11, salt	280,000
Anisole, tech.	228,000	Azolic Diazo Component 12, salt	281,000
Anisoyl chloride	230,000	Azolic Diazo Component 13, salt	282,000
Anisoyl acetate	230,050	Azolic Diazo Component 14, salt	283,000
Anthranilic acid (o-Aminobenzoic acid)	7,000	Azolic Diazo Component 20, salt	284,000
N,N'-(1,5-Anthraquinonylene)dianthranilic acid	232,000	Azolic Diazo Component 32, salt	285,000
Anthracene	237,000	Azolic Diazo Component 34, salt	286,000
Antibiotics, for medicinal use, all other	62,000	Azolic Diazo Component 35, salt	287,000
Antifungal agents, all other	143,000	Azolic Diazo Component 41, salt	290,000
Antineoplastic agents, all other	189,000	Azolic Diazo Component 42, salt	291,000
Antiviral agents, all other	38,600	Azolic Diazo Component 44, salt	292,000
Apramycin	417,900	Azolic Diazo Component 48, salt	293,000
Arachidylbenzylalkyl amine	36,010	Azolic Diazo Component 49, salt	294,000
Aromatics, C ₉	151,000	Azolic Diazo Component 51, salt	297,000
Arsanilic acid	324,000	Azolic diazo components, base, all other	270,000
Anylyl alkyl polyether alcohol	807,000	Azolic diazo components, salt, all other	284,000
Ascorbic acid	2,000	Azolic Orange 3	224,000
Aspartic acid	2,000	Azolic Red 1	227,000
Aspirin	365,000	Azolic Red 2	228,000
Atracurium besylate	745,200	Azolic Red 6	229,000
Aurantol	7,100	Azolic red compositions, all other	234,000
Aurothiogluucose	398,000	Azolic Violet 1	235,000
Azathioprine	277,000	Azolic violet compositions, all other	220,000
Azelaic acid esters, all others	70,000	Azolic Yellow 1	38,700
Azidothymidine	168,300	Bacillus thuringiensis	13,166,010
1,1'-Azobis[2-methyl pentane nitrile]	434,600	Bacitracin (animal feed grade)	63,000
1,1'-Azobisformamide	229,000	Bacterial amylose	93,000
2,2'-Azobis (2-methyl butane nitrile)	434,700	Barium acetate	589,000
2,2'-Azobis [2-methylpropionitrile] (Azobisisobutyronitrile)	435,000	Barium benzoate	9,260
Azolic Black 4	251,000	Barium cadmium laurate	677,000
Azolic black compositions, all other	253,000	Barium 2-ethylhexanoate	15,630,000
Azolic Blue 3	238,000	Barium laureate	15,676,900
Azolic blue compositions, all other	241,000	Barium naphthenate	14,296,000
Azolic Brown 9	246,000	Barium stearate	15,750,000
Azolic brown compositions, all other	249,000	Basic black dyes, all other	359,999
Azolic Coupling Component 2	267,000	Basic black dyes, all other, modified	420,000
Azolic Coupling Component 3	268,000	(Basic Blue 7)	123,007
Azolic Coupling Component 4	268,000		
Azolic Coupling Component 4	269,000		

Table D-1—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Chemical name</i>	<i>Sect. Item No.</i>
Basic Blue 1	04 343.000	Basic Yellow 25	04 365.000
Basic Blue 3	04 400.000	Basic Yellow 28	04 367.000
Basic Blue 7	04 407.000	Basic Yellow 29	04 368.000
Basic Blue 21	04 401.000	Basic Yellow 37	04 324.000
Basic Blue 41	04 404.000	Basic Yellow 53	04 370.053
Basic Blue 54	04 407.000	Basic Yellow 58	04 370.058
Basic Blue 60	04 408.000	Basic Yellow 65	04 370.065
Basic Blue 77	04 412.000	Basic Yellow 79	04 370.079
Basic Blue 94 and 94:1	04 414.094	Basic Yellow 83	04 370.083
Basic Blue 140	04 414.140	Basic Yellow 94	04 370.094
Basic Blue 152	04 350.152	Basic Yellow 96	04 370.096
Basic blue dyes, all other	04 351.000	Basic Yellow 98	04 370.098
Basic blue dyes, all other, modified	04 415.000	Basic yellow 102	04 370.102
(Basic Blue 14, PMA)	05 227.014	Basic yellow dyes, all other	04 325.000
(Basic Blue 1, PTA)	05 227.001	Basic yellow dyes, all other, modified	04 371.000
Basic Brown 1	04 355.000	(Basic Yellow 2), fugitive	05 15.000
Basic Brown 4	04 357.000	Beclomethasone	06 648.500
Basic brown dyes, all other	04 358.000	Benamide	05 15.000
Basic Green 4	04 354.000	Benzaldehyde glyceryl acetal	05 229.200
Basic green dyes, all other	04 354.100	Benzaldehyde, tech.	07 7.500
(Basic Green 1, PMA)	05 230.101	Benzalkonium heparin	06 624.500
Basic Orange 1	04 326.000	Benzamide	03 259.000
Basic Orange 2	04 327.000	Benzene-, cumene-, toluene-, and xylenesulfonates, all other	12 151.000
Basic Orange 21	04 376.000	Benzene 1,3-dihydroxy-2,4 nitroso	15 9.010
Basic orange dyes, all other	04 329.000	Benzene high purity (98-100%)	02 5.500
(Basic Red 1)	05 215.001	Benzene, all other	02 6.500
Basic Red 12	04 333.000	Benzene phosphonic acid	15 9.250
Basic Red 14	04 383.000	Benzene phosphonic dichloride	15 9.255
Basic Red 15	04 384.000	Benzene phosphonic acid	03 264.000
Basic Red 17	04 386.000	Benzene sulfonic acid	12 137.710
Basic Red 22	04 389.000	Benzene sulfonic acid, 2-formyl-, sodium salt	03 264.200
Basic Red 29	04 390.000	Benzene sulfonfyl chloride	03 266.000
Basic Red 46	04 391.046	Benzene, toluene, xylene, mixtures	02 33.000
Basic Red 49	04 392.000	1,2,4-Benzene tricarboxylic acid, 1,2-dianhydride	03 268.100
Basic Red 54	04 392.054	(Trimellitic anhydride)	03 269.000
Basic Red 73	04 392.073	Benzhydrol (Diphenylmethanol)	03 273.100
Basic Red 104	04 392.104	Benzimidazole	06 704.000
Basic Red 111	04 392.111	Benzocaine	06 704.000
Basic red dyes, all other	04 334.000	1,3-Benzodioxole	03 273.500
(Basic Red 81, PMA)	05 221.050	Benzonic acid	06 134.000
(Basic Violet 1)	05 221.001	Benzonic acid, 2-butoxyethanol ester	15 9.015
(Basic Violet 4)	05 221.004	Benzonic acid 2-[4-(dimethylamino)-benzoyl]-	03 274.850
(Basic Violet 10)	05 221.010	Benzonic acid, C ₁₂ -C ₁₈ ester	15 9.030
Basic Violet 1	04 335.000	Benzonic acid, isodecyl ester	15 9.050
Basic Violet 3	04 337.000	Benzonic acid, methyl ester	03 274.903
Basic Violet 4	04 338.000	Benzonic acid, tech.	06 425.000
Basic Violet 10	04 339.000	Benzonitate	03 278.000
Basic Violet 16	04 396.000	Benzonitrile	07 8.000
Basic Violet 35	04 398.035	Benzophenone	03 281.000
Basic violet dyes, all other	04 342.000	2-Benzothiazolethiol, sodium salt	03 281.000
Basic Yellow 2	04 360.000	1H-Benzotriazole	03 281.000
Basic Yellow 11	04 361.000	Benzotriazole, polychlorinated	15 15.300
Basic Yellow 13	04 362.000	Benzotriazole, substituted	15 15.500
Basic Yellow 15	04 364.000	2-Benzoxazolethiol	03 283.200
Basic Yellow 24	04 364.000	Benzoyl chloride	03 286.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Benzoyl peroxide	15 16,000	Beta carotene (provitamin A)	06 769,000
Benzthiazide	08 718,000	Betae hydrochloride	06 614,000
Benztrifone mesylate	06 308,000	Betamethasone	06 649,500
Benzyl acetate	07 9,000	Betamethasone dipropionate	06 649,500
Benzyl alcohol	15 17,000	Betamethasone sodium phosphate	06 650,000
Benzyl (alkylpyridinium) chloride	12 508,190	Betamethasone valerate	06 651,000
Benzylamine	03 289,000	Beta methyl lonone coe ^{vr}	07 104,100
2-(Benzylamino)ethanol	03 290,000	Bethanechol chloride	06 314,500
Benzyl (polyoxyethylene, octadecylamine) ammonium chloride with benzyl (polyoxyethylene, tallowamine) ammonium chloride	12 453,230	Biological stains	14 24,000
Benzyl benzoate	07 11,000	Biotin	06 794,000
Benzyl butyrate	07 12,000	Biphényl	03 307,000
Benzyl chloroformate	15 17,115	N,N-Bis(2,2-acetamido)glycine	14 3,000
Benzyl-2-chloro-4-(trifluoromethyl)-5-thiazolecarboxylate	13 175,012	N,N-Bis(2-aminopropyl)-N,N-dimethyl-N-ethylammonium ethyl sulfate dimer acid	12 467,500
Benzyl citramate	07 13,000	1,4-Bis(3-aminopropyl)piperazine	03 308,500
Benzyl (cocamidopropyl)dimethyl ammonium chloride	12 508,800	2,6-Bis(1 β -azido benzylidene)-4-methylcyclohexanone	03 311,400
Benzyl (cocoon oil alkyl) bis(2-hydroxyethyl) ammonium chloride	12 449,000	Bis(2-bis(2-hydroxyethylamino)ethyl)disopropyl titan	15 058,600
Benzyl (cocoon oil alkyl) dimethyl ammonium chloride	12 509,000	Bis(1,4-bromoaetoxy)-2-butene	13 176,000
Benzyl (cocoon oil alkyl) dimethyl ammonium chloride	12 509,000	2-Bis(bromomethyl)-1,3-propanediol	15 1071,000
Benzyl (dihydrogenated tallow alkyl) dimethyl ammonium chloride	12 509,900	Bis(2-butoxyethyl)ether (Diethylene glycol di-n-butyl ether)	15 1142,000
Benzyl dimethyl (mixed alkyl) ammonium chloride	12 510,000	1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolium chloride, disodium salt	12 20,000
Benzyl dimethyl (tallow alkyl) ammonium chloride	12 511,000	Bis(2-chloroethyl)peroxide	15 17,900
Benzyl dimethyl (tallow alkyl) ammonium chloride	12 512,800	Bis(2-chloroethyl)ether (Dichlorodiethyl ether)	15 1300,000
6-Benzylvedenine (bsp)	13 231,251	Bis(2-chloroethyl)-2-chloroethylphosphonate	15 1017,000
5-(Benzylsilylamino)- <i>o</i> -toluenesulfonic acid	03 293,000	Bis (coconut oil alkyl) amine	12 431,000
Benzyl formate	07 15,000	Bis (coconut oil alkyl) dimethyl ammonium chloride	12 480,000
Benzyl hexadecyl dimethyl ammonium chloride	12 515,000	Bis-carryphenyl-oxoethylene titanate	12 775,800
Benzyl (hydrogenated tallow alkyl) dimethyl ammonium chloride	12 516,000	1,2-Bis(3,9-di-tert-butyl-4-hydroxyhydrocinna ^m oyl)hydrazine	15 17,980
2-Benzyl-2-hydroxy-5,9-dimethyl-6,7-benzomorphanhydrobromide	03 294,950	Bis(dibutylthiocarbamoyl) disulfide	09 144,950
1-Benzyl-1-(2-hydroxyethyl)-2-nor (tail oil alkyl)-2-imidazoline	12 453,000	Bis(2,4-dichlorobenzoyl) peroxide	15 18,000
Benzyl isobutyrate	07 15,400	Bis(dimethylaminoethyl) ether	15 322,900
Benzyl isovalerate	07 15,800	Bis(α,α -dimethylbenzyl)peroxide	15 19,000
Benzyl-methyl-bis (hydrogenated tallow) ammonium chloride	07 15,700	bis(1,3-Dimethylbutyl)phosphorodithioate oily amine salt	14 282,000
Benzyl (mixed alkyl) pyridinium chloride	12 516,500	N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	09 55,351
1-(Benzoyloxy)-2-methoxy-4-propenylbenzene (Benzyl Isoeugenyl ether)	12 516,670	S-(1,2-Bis(ethoxycarbonyl)ethyl)(<i>O</i> , <i>O</i> -dimethyl phosphorodithioate (Malathion))	13 215,000
Benzyl phenylacetate	07 16,000	Bis(2-ethoxyethyl) ether (Diethylene glycol diethyl ether)	15 143,000
1-Benzyl-4-phenylisopentanoic acid	03 298,000	Bis(2-ethylhexyl)hydrogen phosphite	15 1019,600
Benzyl picolinium chloride	12 517,100	Bis(2-ethylhexyl)terephthalate	11 16,350
Benzyl propionate	07 18,000	N,N'-Bis(1-ethyl-3-methylpentyl)-p-phenylenediamine	09 56,000
1-Benzylpyridinium chloride	12 518,000	Bis(ethyl-3-oxobutanato)bis(2-propanolato) titanium	15 1058,800
1-Benzyl quinolinium chloride	12 518,200	Bis(N,N1-ethyl(stearic/arachidic/benelic)amide) cyanoethyl ethylammonium ethosulfate	12 470,400
Benzyl salicylate	07 19,000	2,2-Bis(ferrocenyl)propane	15 19,200
Benzyl (tallow alkyl) bis(2-hydroxyethyl) ammonium chloride	12 453,500	Bis-hexamethylenetriamine amine	15 260,000
Benzyltrichloroacetimidate	03 298,500	Bis(hydrogenated tallow alkyl) amine	12 432,000
Benzyltrimethylammonium chloride	03 298,400	Bis(hydrogenated tallow alkyl) dimethyl ammonium chloride	12 481,000
Benzyltrimethylammonium chloride	12 519,000	Bis(hydrogenated tallow alkyl) dimethyl ammonium sulfate	12 482,000
Benzyltrimethylammonium hydroxide	03 300,000	N,N'-Bis(2-hydroxyethyl) aniline	03 325,500
		Bis(2-hydroxyethyl, ethoxylated) methyloctadecylammonium chloride	12 455,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Bis-2-hydroxyethyl-hydrogenated tallow-ethyl sulfate	12 455,500	03 343,503
Bis-(2-hydroxyethyl)isocyclopropylamine oxide	12 321,700	03 343,700
N,N-Bis(2-hydroxyethyl)octadecylamine	12 322,000	03 344,000
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate	12 455,600	15 1202,000
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	12 324,000	03 344,900
Bis(2-hydroxyethyl)tallowmonium ethanoate	12 0,500	15 1202,900
2,2-Bis(hydroxy-methyl)propionic acid	15 494,500	15 496,500
2,2-Bis(4-hydroxypropyl)-4-methylpentane	10 20,550	13 40,017
Bis(hydroxypropyl)azelaate	11 66,600	15 1205,000
4,6-Bis(isopropylamino)-2-methoxy-s-triazine (Prometon)	13 118,010	15 22,400
2,4-Bis(isopropylamino)-6-(methylthio)-s-triazine (Prometyn)	13 41,500	15 1206,000
Bis(2-(2-methoxyethoxy)ethyl)ether (Tetraethylene glycol dimethyl ether)	15 1145,000	15 1207,000
Bis(2-methoxyethyl)ether (Diethylene glycol dimethyl ether)	15 1146,000	15 1209,000
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	09 60,000	06 447,000
N,N-Bis(4-methylphenyl)sulfonylamine, potassium salt	03 327,500	06 448,000
Bis(morpholinolthiocarbonyl) disulfide	09 38,500	02 49,000
Bismuth 2-ethylhexanoate	15 630,500	02 48,000
Bismuth neodecanoate	15 701,900	06 449,000
Bis(2-(octadecylamido)ethyl)-N-(2-cyanoethyl)-N-ethyl ammonium ethyl sulfate	15 229,500	06 700,000
Bis(pentachloro-2,4-dicycloptadien-1-yl)	13 128,000	15 1072,000
Bis(perfluoroalkyl)bis(alpha-monochlorohydrin) pyromellitate	15 21,080	15 1073,000
Bisphenol A, ethoxylated and propoxylated	12 742,095	15 1317,400
Bisphenol A, ethoxylated	12 742,090	15 619,200
Bisphenol, hindered	09 88,100	07 127,470
Bis(tallow alkyl)dimethylammonium chloride	12 482,500	12 726,900
1,2-Bis(tribromophenoxy)ethane	03 330,218	12 726,910
Bis(tributyltin) oxide	13 195,015	15 1284,000
Bis(triphenylsilyl)chromate	15 21,400	02 45,000
Bis(ethylene diisocyanate (TDI))	03 1017,000	02 46,000
Blend of fatty and phosphate esters	12 111,800	02 47,000
Blowing agents, cyclic, all other	09 110,000	
Boric acid-amine adducts	15 1367,700	
Bornyl phenylamine	14 271,000	
Boron fluoride phenol complex	15 22,000	
Boron trichloride-amine complex (DY 9577)	15 1369,200	
Bromochlorone	06 251,000	
Brominated (Including bromochlorinated) hydrocarbons, all other	15 1216,000	
Bromoacetic acid	13 245,017	12 342,220
Bromobenzene	15 495,000	15 1074,000
o-Bromobenzic acid	03 335,000	13 165,014
m-Bromobenzic acid	03 336,000	15 1317,460
3-[3-(4'-Bromo-1'-biphenyl)-4'-yl]-1,2,3,4-tetrahydro-1-naphthalenyl-4-hydroxy-2H-1-benzopyran-2-one	13 169,500	15 1148,000
1-Bromobutane (n-Butyl bromide)	11 497,000	15 1149,000
5-Bromo-3-sec-butyl-6-methyluracil (Bromacil)	13 42,000	
Bromobutyric acid	15 495,000	
Bromochlorodifluoromethane	15 1252,800	
Bromochloromethane	15 1199,000	
2-Bromo-1,2-trifluoroethane	15 1253,100	
2-Bromo-2-chloro-1,1,1-trifluoroethane (Halothane)	15 1253,000	
4-Bromo-3,5-dihydroxybenzamide	03 343,503	
4-Bromo-3,5-dihydroxybenzoic acid	03 343,700	
2-Bromo-4,6-dinitroaniline	03 344,000	
Bromoethane [Ethyl bromide]	03 344,900	
1-Bromo-4-ethoxy-2-methylbenzene	15 1202,900	
1-Bromohexadecane	15 496,500	
2-Bromo-4-hydroxyacetophenone	13 40,017	
1-Bromo-2-methyl-2-butene	15 1205,000	
β-Bromo-β-nitrostyrene	15 22,400	
1-Bromo-octadecane	15 1206,000	
1-Bromopentane (n-Amyl bromide)	15 1207,000	
1-Bromopropane (n-Propyl bromide)	15 1209,000	
2-Bromopropane (Isopropyl bromide)	15 1210,000	
2-Bromopyridine	03 359,000	
Bromotrifluoromethane	15 1254,000	
Bromophenylamine maleate	06 85,000	
Butabarbital	06 447,000	
Butabarbital, sodium	06 448,000	
Butadiene and butylene fractions	02 49,000	
1,3-Butadiene, grade for rubber (Elastomers)	02 48,000	
Butalbal	06 449,000	
Butamben	06 700,000	
1,2-(and 1,3)-Butanediol	15 1072,000	
1,4-Butanediol	15 1073,000	
1,2,4-Butanetricarboxylic acid, 2-phosphono, sodium salt	15 1317,400	
Butanoic acid, 1-cyclohexylethyl ester	15 619,200	
Butanol, ethoxylated	07 127,470	
2-Butanol, ethoxylated and propoxylated	12 726,900	
2-Butanone peroxide (MEK peroxide)	15 1284,000	
1-Butene	02 45,000	
2-Butene	02 46,000	
1-Butene and 2-butene, mixed	02 47,000	
2-Butenedioic acid-(E)-dlaminol-(2-aminoethyl)-2-(tall oil alkyl)-2-imidazolone condensate	12 342,220	
2-Butene-1,4-diol	15 1074,000	
2,3,4,5,6-Butenylene-tetrahydrofurfural	13 165,014	
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	15 1317,460	
2-Butoxyethanol (Ethylene glycol monobutyl ether)	15 1147,000	
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	15 1148,000	
2,2-(2-Butoxyethoxy)ethoxyethanol (Triethylene glycol monobutyl ether)	15 1149,000	
α-2-(2-Butoxyethoxy)ethoxy-4,5-methylenedioxy-2-propyltoluene (Piperonyl butoxide)	13 172,000	
2-(2-Butoxyethoxy)ethyl acetate	15 1098,000	
1-Butoxyethoxy-2-propanol	15 1150,000	
2-Butoxyethyl acetate	15 1099,000	
2-Butoxyethyl benzoate	15 22,990	
Butoxyethylene oxyacetate, sodium salt	12 35,950	
Butoxyethyl phosphate	12 92,200	
n-Butyl acetate	15 890,000	
n-Butyl acetylcholine	11 106,000	

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Butyl acid phosphate	15	Butyl lactate	15
Butyl acrylate	15	Butyl levulinate	15
Butyl acrylate ethyl acrylate copolymer resins	08	n-Butyllithium	15
n-Butyl alcohol (n-Propylcarbinol)	15	sec-Butyllithium	15
sec-Butyl alcohol (Methylethylcarbinol)	15	Butyl maleate	15
Butyl alcohol (Trimethylcarbinol)	15	n-Butyl mercaptan (1-Butanethiol)	02
Butyl alcohol, ethoxylated and phosphated	12	sec-Butyl mercaptan (2-Butanethiol)	02
Butyl alcohol, propoxylated	12	Butyl mercaptan (2-Methyl-2-propanethiol)	02
n-Butylamine, mono	15	Butyl mercaptopropionate	15
sec-Butylamine, mono	15	Butyl methacrylate	15
tert-Butylamine, mono	15	Butyl methacrylate-ethyl methacrylate copolymer resins	08
tert-Butylamine, mono	15	2 (and 3)-tert-Butyl-4-methoxyphenol (BHA)	15
Butyl p-aminobenzoate	03	tert-Butyl- α -methylcrocinmalealdehyde	07
2-(sec-Butylamino)-4-ethylamino-6-methoxy-s-triazine	13	2-[1-(1-Butyl-2-methylindol-3-yl)carboxylbenzoyl]acetic acid	03
tert-Butylaminoethyl methacrylate	03	Butyl methyl pyrophosphate ethyleneoxy titanium salt/n, n-dimethyl amine ethyl methacrylate salt	12
p-Butylaniline	03	Butyl methyl pyrophosphate isopropoxy titanium salt	12
tert-Butylbenzaldehyde	07	octyl phosphite adduct	12
n-Butylbenzene	11	Butylmorpholine	15
N-n-butyl benzensulfonamide	15	Butylmagnatanesulfonic acid, sodium salt	15
Butyl benzoate	15	Butyl octyl phthalates	11
N-tert-Butyl-2-benzothiazolesulfenamide	09	Butyl oleate	11
tert-Butylbenzylamine	12	Butyl oleate, sulfated, sodium salt	15
Butyl benzyl phthalate	11	n-Butyl palmitate	11
n-Butyl-4,4-bis-butylperoxyvalerate	15	tert-Butyl perchlorocrotonate	15
Butyl butyrate	07	tert-Butyl peroxybenzoate	15
Butyl butyl lactate	07	tert-Butyl peroxy-2-ethylhexanoate	15
sec-Butyl chloroformate	15	tert-Butyl peroxyisobutyrate	15
3-tert-Butyl-5-chloro-6-methyluracil	13	tert-Butyl peroxyisopropylcarbonate	15
2-tert-Butyl-p-cresol	03	tert-Butylperoxy maleic acid	15
6-tert-Butyl-o-cresol	03	tert-Butyl peroxyneodecanoate	15
2-tert-Butyl cyclohexanol	07	tert-Butyl peroxyvalerate	15
2-sec-Butylcyclohexanone	07	o-sec-Butylphenol	03
o-tert-Butylcyclohexyl acetate	07	o-tert-Butylphenol	03
p-tert-Butylcyclohexyl acetate (Verbenlax)	07	p-sec-Butylphenol	03
tert-Butyldiethanolamine	15	p-tert-Butylphenol	03
tert-Butyldiphenylchlorosilane	03	p-tert-Butylphenol-formaldehyde, alkoxylated	12
Butylene glycol adipate	11	Butylphenols, mixed	03
1,3-Butylene glycol diborate	15	2-(p-tert-Butylphenoxy)cyclohexyl-2-propynyl sulfite	13
1,3-Butylene glycol diborate/hexylene glycol boric anhydride	15	p-tert-Butylphenyl glycidyl ether	15
1,3-Butylene glycol, ethoxylated	12	tert-Butylphenyl glycidyl ether	15
Butylene oxide	15	N-(3-(p-tert-butylphenyl)-2-methylpropylidene)-aminotranitic acid, methyl ester	07
tert-Butyl ethanolaniline	15	Butyl phosphate	12
Butyl ethers of tetra- and higher ethylene glycols (high boiling)	15	Butyl propionate, potassium salt	12
n-Butylmethylaniline	15	Butyl primary butyl glycolate	11
Butyl 2-ethylhexyl phthalate	11	Butyl picolinium bromide	12
Butyl ethyl magnesium	15	Butyl picolinium bromide	12
N-Butyl-N-ethyl- α , α -trifluoro-2,6-dinitro-p-toluidine (Benefin)	13	Butyl ricinoleate	11
Butyl formel	15	n-Butyl stearate	11
tert-Butyl hydroperoxide	15	p-tert-Butyltoluene	03
tert-Butylhydroquinone	15		
4,4'-Butyldenebis(6-tert-butyl-m-cresol)	09		
Butyl (isobutylene-isoprene) type	15		
Butyl and isopropyl phthalimides	15		

Table D-1—Continued
Alphabetical chemical Index

<i>Chemical name</i>	Sect. Item No.	<i>Chemical name</i>	Sect. Item No.
Butyl 2-[4-[5-(trifluoromethyl)-2-pyridinyl]oxy]pheno-		Caproin	
Xypropanoate	43,050	Carbamate 82m	06
Bury undecylenate	17	Carbamate 82n	15
tert-Butyl urea	329,500	Carbamic acid	06
Buryl ether	1305,000	Carbamic acid, sodium salt	06
8-tert-Butyl-2,4-xyleneol	391,000	Carbamic acid, sodium salt	06
2-Butyne-1,4-diol	1075,000	Carbamic acid, sodium salt	06
Butyraldehyde	784,000	1-Carboethoxyethyl 5-[2-chloro-4-(trifluoromethyl)-	
Butyraldehyde-amine condensate	52,000	2-phenoxy]-2-nitrobenzoate	13
Butyraldehyde diethyl acetal	137,655	2-Carboethoxy-1-propenyl dimethyl phosphate	13
1-Butyraldehyde trimer	1151,700	Carbon Black oil	01
Butyric acid	499,000	Carbon disulfide	15
Butyric anhydride	500,000	Carbon tetrachloride	15
Butyrolactone	104,500	Carbonyl diisocyanate	03
n-Butyrolonitrile	436,000	Carbonyl diisocyanate, sodium salt	06
Butyryl chloride	531,000	1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-	
Calcium 2-ethylhexanoate	631,000	imidazolium hydroxide, sodium derivative, sodium salt	12
Cadmium laurate	627,300	1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-	
Cadmium naphthenate	797,000	imidazolium hydroxide, sodium derivative, sodium salt	12
Cadmium stearate	751,000	(1-Carboxyheptadecyl)trimethylammonium hydroxide,	
Caifene, natural	537,000	inner salt	12
Caifene, synthetic	636,000	5 (or 6) carboxy-4-hexyl-2-cyclohexene-1-octanoic acid,	
Calcitonin	691,500	potassium/sodium salts	12
Calcium acetate	15	5 (or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid,	
Calcium t- α -alkylcarboxylate	688,000	reaction products with castor oil	12
Calcium ascorbate	808,000	Carboxylic acid alkanolamine condensates, all other	12
Calcium citrate	622,000	Carboxylic acid amides, all other	12
Calcium 2-ethylhexanoate	632,000	Carboxylic acid-diamine and polyamine condensate,	
Calcium formate	648,000	all other	12
Calcium gluceptate	759,000	Carboxylic acid-diamine and polyamine condensates,	
Calcium linoleate	681,000	all other	12
Calcium manganese tetracetate	170,000	alkoxylated, all other	12
Calcium mercaptoacetate	693,000	Carboxylic acid esters, all other	12
Calcium naphthenate	298,000	Carboxylic acids, all other	12
Calcium neodecanoate	703,000	Carboxylic acids with amide, ester or ether linkage, other	12
Calcium oleate	718,000	N-Carboxy-N-methylanthranilic anhydride	03
Calcium polycarbophil	591,600	Carboxymethyl-[3-cocooamidopropyl] dimethyl ammonium	
Calcium propionate	737,000	chloride, sodium salt	12
Calcium stearate	752,000	(Carboxymethyl)3-(coconut oil amide) propyldimethyl-	
Calcium undecylenate	135,000	ammonium hydroxide, inner salt	12
Camphene	29,000	1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-	
Campholenic aldehyde	29,100	imidazolium hydroxide, sodium derivative, sodium salt	12
Camrenate, potassium	29,100	1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-	
Camrenate, potassium	736,700	imidazolium hydroxide, sodium derivative, sodium salt	12
Capramidopropyl betaine	111,500	1-Carboxymethyl-1-(2-hydroxyethyl)-2-imidazolium	
Caprymethylol	0,600	hydroxide sodium derivative, sodium salt	12
Capric acid (Ratio = 2/1)	39,150	1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-	
Capric acid (Ratio = 1/1)	530,000	imidazolium hydroxide, sodium derivative, sodium salt	12
Caprolactam (2-Oxohexamethylamine)	546,010	1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-	
Caprolactam magnesium bromide	29,500	imidazolium hydroxide, sodium derivative, sodium salt	12
Caprolactone	29,505	1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-	
3-Caproylamidoethylene-(2-hydroxyethyl)aminopro-	104,600	imidazolium hydroxide, sodium derivative, sodium salt	12
plonic acid	0,700	(Carboxymethyl)-3-(lauryl amido propyl) dimethyl	
Caprylamphopropionate	9,800	ammonium hydroxide inner salt	12
Caprylic amphopropionate	705,300	(1-Carboxyundecyl)trimethylammonium hydroxide,	
		inner salt	12
			12
			9,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Carnauba wax, ethoxylated	12 668,950	1-(3-Chloroallyl)-3,5,7-triazo-1-azoniaadamantane chloride	15 32,000
Carvacrol	07 23,500	2-Chloro-4-aminotoluene	03 412,500
l-Carvone	07 94,300	o-Chloroaniline	03 414,000
o-Carvophyllene	07 94,500	p-Chloroaniline	03 415,000
Castor oil acids (Ratio = 2/1)	12 531,000	p-Chlorobenzaldehyde	03 425,000
Castor oil acids, potassium salt	12 52,000	Chlorobenzene, mono	03 427,000
Castor oil, ethoxylated	12 669,000	p-Chlorobenzenesulfonic acid	03 430,000
Castor oil fatty acids, dehydrated	15 502,000	5-Chlorobenzotriazole	14 329,000
Castor oil, sulfated sodium salt	12 305,000	4-Chloro-2,6-bis(2,4-dihydroxybenzyl)phenol	09 124,200
Cationic surface-active agents, all other	12 529,000	2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	13 44,050
α-Cedrene epoxide (Andrane)	07 94,760	1-Chlorobutane (n-Butyl chloride)	15 1221,000
Cedrol	07 94,780	2-Chloro-1,4-dibutoxybenzene	03 440,780
Cedryl acetate	07 94,800	1-Chloro-1,4-dibutoxy-4-nitrobenzene	03 440,803
Cedryl formate	07 94,810	2-Chloro-2,5-dichloro-4-nitrobenzene	03 440,900
Cerlarol	06 39,300	2-Chloro-2,6-diethyl-N-(n-butoxyethyl)acetanilide (Butachlor)	03 441,000
Ceramandole	06 39,500	2-Chloro-2,6-diethyl-N-(methoxyethyl)acetanilide (Alachlor)	13 44,160
Cerazolin, sodium	06 40,000	1-Chloro-1,1-difluoroethane	15 44,180
Ceronicid	06 40,100	Chlorodifluoromethane (F-22)	15 1255,000
Cerofixin	06 40,200	4-Chloro-2,5-dimethoxyacetanilide	15 1256,000
Cerfadime	06 40,500	2-Chloro-1,4-dimethoxybenzene	03 446,000
Cerfuroxime	06 40,700	2-Chloro-4,6-dimethylaniline	03 451,200
Celulose acetate	14 384,000	2-Chloro-N,N-dimethyltetramine (Dimethylamino ethyl chloride) hydrochloride	15 334,000
Celulose acetate butyrate	08 21,000	1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	03 453,000
Celulose acetate hexahydrophthalate	15 29,900	3-Chlorodiphenylamine	03 457,000
Celulose acetate phthalate	15 30,000	2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)acetamide (Acetochlor)	13 44,190
Celulose acetate propionate	14 413,000	2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene (Oxyfluoren)	13 118,044
Celulose ethers and esters, all other	06 635,000	2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (Atrazine)	13 45,000
Celulose, oxidized	06 21,040	2-[4-Chloro-6-(ethylamino)-s-triazin-2-ylamino]-2-methylpropionitrile (Cyanazine)	13 45,100
Celulose plastics, all other	15 1430,250	p-[[2-Chloroethyl]methylamino]benzaldehyde	15 1224,000
Cephalalex	06 41,000	Chloroform	13 45,200
Cephalothin, sodium	06 43,000	2-Chloro-N-isopropylacetanilide (Propachlor)	15 1226,000
Cephadrine	06 43,600	2-Chloro-N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)aminocarbonylbenzenesulfonamide	13 118,054
Cerlum 2-ethylhexanoate	15 632,200	Chloromethyl ethyl ether	15 231,700
Cetylcosyl methacrylate	15 911,700	4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt	15 1307,000
Cetylpyridium chloride	06 256,000	4-Chloro-2-methylphenoxyacetic acid, iso-octyl ester dimethylamine salt	13 109,011
Chelating agents, nitriloacids and salts, all other	14 90,000	3-Chloro-2-methyl-1-propene (Methallyl chloride)	13 118,048
Chemical indicators	14 91,000	1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	03 495,000
Chemically defined linear alcohol, alkoxylated, all other	12 734,000	2-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	03 498,000
Chemical reagents and fine chemicals	14 92,000	2-Chloro-4-nitrobenzoic acid	03 506,000
Chlorinated fatty materials	14 92,000	2-Chloro-4-nitrobenzolic acid, potassium salt	03 508,030
Chlorinated (not otherwise halogenated) hydrocarbons, all other	15 1327,700		
Chlorinated insecticides, cyclic, all other	15 1252,000		
Chlorinated paraffins, 35-64% chlorine	13 147,000		
Chlorinated paraffins, less than 35% chlorine	15 1219,000		
Chlorinated paraffins, 65% or more chlorine	15 1218,000		
Chlorinated rubber, natural and synthetic	15 1220,000		
Chloroacetic acid, mono	10 9,050		
4-Chloroacetophenone	15 503,000		
Chloroalkyl diposphate ester, neutral	03 411,000		
Chloroalkyl phosphate ester	15 1021,700		
	15 1021,702		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
4-Chloro-3-nitrobenzotrifluoride	03 508 100	Chlorphenesin carbamate	06 477 000
2-Chloro-4-nitrotoluene	03 512 000	Chlorpheniramine maleate	06 89 000
5-Chloro-2-pentanone	03 811 000	Chlorpheniramine tartrate	06 90 000
2-Chlorophenothiazine	03 519 000	Chlorpromazine hydrochloride	06 484 000
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-one	13 40 009	Chlorpropamide	06 687 000
α -(2-Chlorophenyl)- α -(4-chlorophenyl)-5-pyrimidine-methanol	13 40 020	Chlortetracycline (medicinal grade)	06 31 000
o-Chlorophenyleclopentyl ketone	03 522 300	Chlortetracycline (animal feed grade)	06 84 000
N-(4-Chlorophenyl)-N-(3,4-dichlorophenyl)urea	03 523 100	Cholecalciferol (vitamin D ₃)	06 811 000
4-Chloro-o-phenylenediamine	03 523 000	Cholesterics and hydrocholesterics, all other	06 604 000
α -(2-Chlorophenyl)- α -(4-fluorophenyl)-5-pyrimidine-methanol	13 40 019	Cholesterol esterase	14 122 000
β -(4-Chlorophenyl)methyl- α -(1,1-dimethylethyl)-1,2,4-triazole-1-ethanol	13 168 994	Cholesterol oxidase	15 342 000
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolinone	13 118 067	Choline bicarbonate	06 605 000
Chlorophenyl trichlorosilane	15 33 950	Choline bitartrate	06 608 000
4-Chlorophthalic acid	03 528 000	Choline chloride (animal feed grade)	06 607 000
1-Chloropinacolone	15 812 320	Choline citrate	06 610 000
3-Chloro-1,2-propanediol (Glycerol α -chlorohydrin)	15 1076 000	Choline dihydrogen citrate	06 611 000
Chloro-2-propanone (Chloroacetone)	15 813 000	Choline magnesium salicylate	06 385 300
3-Chloropropene (Allyl chloride)	15 1229 000	Chromium acetate	15 592 000
1-(3-Chloropropyl)-4-methylpiperazine	03 530 000	Chromium 2-ethylhexanoate	15 632 500
α -Chloropropyltrichlorosilane	15 1379 000	Chromolum naphthenate	14 299 000
Chloropropyltrimethoxysilane	15 1380 000	Cimetidine	06 619 400
3-Chloropropyl-2,5-xylol ether	03 530 070	Cineole eucalyptol	07 23 700
2-Chloropyridine	03 532 000	Cinnamaldehyde	07 24 200
2-(4-(6-Chloro-2-quinolalyl)oxy)phenoxy]propionil acid ethyl ester (Quizalofop ethyl)	13 76 060	Cinnamic aldehyde dimethyl acetal	07 24 200
4-Chlororesorcinol	03 537 000	Cinnamontirils	15 34 780
5-Chlorosalicylic acid	03 537 400	Cinnamyl acetate	07 25 000
Chlorosulfonated polyethylene (CSM) type	10 9 100	Cinnamyl alcohol	07 26 000
2-(4-(Chlorosulfonylphenyl)ethyl)trichlorosilane	03 539 200	Cinnamyl butyrate	07 27 100
Chlorosulfurized sperm oil	14 197 000	Cinnamyl citramate	07 27 500
7-Chloro-1,2,3,4-tetrahydro-2-methyl-3-(2-methylphenyl)-4-oxo-6-quinolonesulfonamide	03 539 500	Cinnamyl nitrile	07 28 000
Chlorothiazanthone	15 34 600	Cinoxacin	06 278 002
Chlorothiazide	06 719 000	Cisplatin	06 279 200
α -Chlorotoluene	03 543 000	Citral dimethyl acetal	09 127 700
α -Chlorotoluene (Benzyl chloride)	03 545 000	Citric acid and acetylcitric acid esters, all other	11 171 000
3-Chloro-p-toluidine NH ₂ -1	03 547 000	Citric acid salts, all other	11 505 000
2-Chloro-6-(trichloromethyl)pyridine	13 168 991	Citric acid, sodium salts (50% in sodium phosphates (20%))	15 627 000
Chlorotrifluoroethylene (Trifluorovinyl chloride)	12 1258 000	Citronellyl acetate	12 53 500
Chlorotrifluoroethane (F 13)	15 1259 200	Citronellyl formate	07 128 000
2-Chloro-N-[[[4-(trifluoromethoxy) phenyl] amino] carbon-yl] benzamide	13 133 200	Citronellyl isobutyrate	07 131 000
3-(2-Chloro-4-trifluoromethylphenoxy)toluene	03 556 050	Citronellyl propionate	07 131 500
4-Chloro- α , α -trifluoro-3-nitrotoluene	03 557 000	Clindamycin	06 45 000
p-Chloro- α , α -trifluorotoluene	03 558 000	Clorzepam dipotassium	06 498 000
6-Chloro- α , α -trifluoro-m-toluidine	03 559 000	Clorsulon	06 116 500
Chlorotrimethylsilane	15 1381 000	Clobacillin, sodium	06 13 000
4-Chloro-3,5-xylene	03 565 000	Cobalt acetate	15 593 000
		Cobalt t- α -alkylcarboxylate	15 669 000
		Cobalt 2-ethylhexanoate	15 633 000
		Cobaltite acetylacetonate	15 1281 500

Table D-1—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Item No.</i>
Cobalt manganese acetate	15	593,010
Cobalt manganese tetracetate	15	172,010
Cobalt naphthenate	14	301,000
Cobalt neodecanate	15	705,000
Cobalt-potassium 2-ethylhexanoate	15	633,010
Cobalt stearate	15	753,000
Cobalt tallow	15	172,000
N-Cocoalkyl-1,3-propylenediamine acetate	13	245,011
Cocamidodimethylglycolate	12	9,250
3-(Cococarnido-N,N-dimethyl)propylamine oxide	12	385,285
N-(Cococarnidopropyl)-N-acetic acid ammonium salt	12	482,600
Cocamidopropyl betaine	12	9,255
Cocamidopropyl dimethyl amine	12	328,300
Cocamidopropyl dimethyl amine oxide	12	385,280
N-Cococarnido-propyl-N,N-dimethylamine oxide	12	385,280
3-[3-(Cococarnidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	12	9,580
3-Cococarnidopropyl-2-hydroxy-3-sulfopropyl(dimethyl)ammonium hydroxide, inner salt	12	9,600
Cococarnidocarbonylchloride	12	9,700
Cococarnidocarbonylpropionate	12	9,260
Cococarnidocarbonylpropionate	12	9,265
Cococarnidopropionate	12	9,280
Cocodimethyl ethyl ammonium ethyl sulfate	12	482,750
Cococut oil acids	12	589,000
Cococut oil acids (Ratio = 1/1)	12	594,000
Cococut oil acids (Ratio = 2/1)	12	592,000
Cococut oil acids (Ratio = 1/1)	12	596,000
Cococut oil acids (Ratio = 2/1)	12	596,000
Cococut oil acids	12	594,000
Cococut oil acids, diethanolamine salt	12	29,100
Cococut oil acids-dimethylaminopropylamine condensate (amine/acid ratio = 1/1)	12	586,480
Cococut oil acids-ethanolamine condensate, ethoxylated	12	576,000
Cococut oil acids, ethanolamine salt	12	29,200
Cococut oil acids-ethanolamine salt, sulfated, potassium salt	12	248,000
Cococut oil acids and oleic acid, potassium salt	12	55,700
Cococut oil acids, potassium salt	12	54,000
Cococut oil acids, sodium salt	12	55,000
Cococut oil acids, 2-sulfoethyl ester, sodium salt	12	198,000
N-(Cococut oil acyl)-N-methyltaurine, sodium salt	12	183,000
N-(Cococut oil acyl)sarcosine, sodium salt	12	40,000
Cococut oil alcohol, ethoxylated	12	735,000
N-(Cococut oil alkyl)-β-alanine, partial sodium salt	12	10,100
N-(Cococut oil alkyl)-β-alanine, sodium salt	12	10,000
3-(Cococut oil alkyl)amidoethylene-(2-hydroxyethyl)aminoethanol acid	12	10,130
(Cococut oil alkyl)amine, ethoxylated	12	418,000
(Cococut oil alkyl)amine, ethoxylated acetate	12	326,000
Cococut oil alkylamine, ethoxylated and phosphated	12	327,000
Cococut oil alkylamine, propoxylated	12	327,550
N-(Cococut oil alkyl)amidoethyl acid, sodium salt	12	483,000
(Cococut oil alkyl)bis(2-hydroxyethyl, ethoxylated)-methylammonium chloride	12	456,000
<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Item No.</i>
(Coconut oil alkyl)-bis-(hydroxyethyl)methyl ethoxylated mono-(2-carboxyethyl)ether methyl sulfate, potassium salt	12	456,025
N-(Coconut oil alkyl)trimethylenediamine	12	407,000
Coconut oil amide	15	232,000
Coconut oil, ethoxylated	12	669,200
Coconut oil fatty acid polyoxyethylene	12	456,100
Coconut oil sulfated sodium salt	12	306,000
Cocoyl amido-propyl and tallow acids (Ratio = 2/1)	12	533,000
Cocoyl amido-propyl dimethylamine oxide	12	327,600
Cocoyl chloride	15	505,500
Codaine	06	429,000
Cod oil sulfated, sodium salt	12	298,000
Coelstipol hydrochloride	06	614,500
Complex glycerol esters, all other	12	651,000
Complex, linear polyesters and polymeric plasticizers, all other	12	651,000
Copolyurethane urea	11	132,000
Copper acetate	15	386,000
Copper 1-α-alkylcarboxylate	15	594,000
Copper 2-ethylhexanoate	15	689,050
Copper gluconate	15	634,000
Copper naphthenate	06	702,000
Copper oleate	14	302,000
Copper, [2,2',2'',2''',-]29H, 31H- phthalacyaninene/pentakis (methylene)pentakis [1H- isoindole-1,3(2H)-donato]]	15	718,000
Corn oil acids, potassium salt	03	588,603
Corticotrophin	06	86,000
Cortisone acetate	06	692,000
Courmarin	07	653,000
Courmarone-indene resins	08	29,000
Creosote oil (Dead oil) creosote content in solution (100 Percent basis)	01	21,000
Creosote oil (Dead oil) creosote in coal tar solution (100 Percent solution basis)	01	20,000
Creosote oil (Dead oil) distillate as such (100 Percent creosote basis)	01	19,000
m-Cresol	03	589,000
p-Cresol	03	572,000
o-Cresol, from petroleum	03	571,000
[m,p]-Cresol, from petroleum	03	574,000
Cresolsulfonic acid, formaldehyde condensate	15	34,830
m-Cresyl acetate	06	258,500
Cresyl glycidyl ether	15	35,500
Cresyl glycidyl ether	15	34,900
Cresylic acid (Less than 75 percent distilling over 215 C)	02	12,000
Cresylic acid, refined;	03	580,000
Crotonaldehyde	15	786,000
Crotonic acid (2-Butenoic acid)	15	506,000
Crude acetate mixture (Linalyl, neryl, geranyl acetates, main components)	07	162,100
Crude coal tar	01	0,500
Crude coal tar solvent	01	22,030
Crude light oil	01	1,000
Crude tar acid oils having a tar acid content of all other	01	17,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Crude tar acid oils having a tar acid content of 5 percent to less than 24 percent	01	Cyclohexene oxide	03
Cumene (isopropyl benzene)	15	β-(1-Cyclohexenyl)ethylamine	03
Cumene hydroperoxide	15	Cycloheximide	06
Cumenesulfonic acid	03	Cyclohexylamine	03
Cumenesulfonic acid, ammonium salt	12	3-Cyclohexyl-2-benzothiazolesulfenamide	09
Cumenesulfonic acid, sodium salt	144, 100	N-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	13
Cumyl acetate	07	1,4-Cyclohexylenedimethanol	15
Cumyl alcohol	07	Cyclohexyl isocetyl phthalate	11
Cumyl formate	07	Cyclohexyl methacrylate	15
α-Cumyl peroxynonadecanoate	15	Cyclohexylmethyldimethoxysilane	03
Cumyl phenolate isopropoxy titanium salt	12	N-Cyclohexyl-N-palmitoylaurine, sodium salt	12
2-Cyanoacetamide	15	N-Cyclohexyl-N-phenyl-p-phenylenediamine	09
Cyanoacetic acid (Malonic nitrile)	15	N-Cyclohexyl salicylate	07
4-(Cyanacetamyl)morpholine	03	N-(Cyclohexylthio)phthalimide	09
Cyanocobalamin (animal feed grade)	06	Cyclooctadiene	03
Cyanocobalamin (U.S.P. crystalline)	06	Cyclopentane	07
Cyanocobalamin (U.S.P. crystalline)	15	Cyclopentane	02
1-(2-Cyanoethyl)ethyl urea	03	(2-Cyclopenten-1-yl)-2-propanone	07
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate	13	2-Cyclopenten-1-yl)-2-propanone	03
N-Cyano-s-methyl-N-(2,4-methyl-5-imidazolyl)-methylthioethylisothiourea	03	3-(2-ethyl-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-3-(2-methyl-1,1-biphenyl-3-yl) methyl ester	03
Cyano-3-phenoxybenzyl-clis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	13	α-Cyclopropyl-α-(p-methoxyphenyl)-5-pyrimidine methanol (Ancymidol)	13
Cyano(3-phenoxyphenyl)methyl-4-chloro-α-(1-methylethyl)benzeneacetate	13	2-Cyclopropylmethylamino-5-chlorobenzophenone	03
Cyanoic acid	15	2-(N-Cyclopropylmethyl-N-phthalimidoacetyl)-amino-5-chlorobenzophenone	03
Cyclacillin	06	Cycloserine	06
Cyclic amphoteric surface-active agents, all other	12	Cyclosols	02
Cyclic chemicals all other	12	p-Cymene	03
Cyclic elastomers, all other	10	Cypermethrin	13
Cyclic fungicides, all other	13	Cyproheptadine hydrochloride	06
Cyclic herbicides, all other	13	Cytarabine	06
Cyclic insecticides, all other	13	Danzol	06
Cyclic insecticides, all other	13	Decabromodiphenyl ether (DBDF)	15
Cyclic insecticides, all other	13	Decahydronaphthalene (Decalin)	15
Cyclic plasticizers, all other	11	trans-Decahydro-β-naphthyl acetate	17
Cyclic silizane	15	Decanal (Capraldehyde)	07
Cyclized polyisoprene (Cyclo rubber)	10	1-Decanone	12
Cyclobenzaprime hydrochloride	06	n-Decane	15
Cyclohexane	03	1-Decanol	15
1,4-Cyclohexane dicarbonyl chloride	15	Decanoyl chloride	15
1,4-Cyclohexanedicarboxylic acid	03	Decanoyl peroxide	15
1,2-Cyclohexanedicarboxylic acid anhydride	15	Decyl acetate	07
Cyclohexane dimethanol diethyl ether	03	Decyl alcohol, ethoxyethylated and phosphorylated	12
Cyclohexanesulfamic acid (Cyclamic acid)	15	Decyl alcohol, ethoxyethylated and phosphorylated, potassium salt	12
Cyclohexanesulfamic acid, sodium salt	07	Decyl alcohol, ethoxyethylated and propoxylated	12
(Sodium cyclamate)	07	n-Decyl mercaptan	09
Cyclohexanethiol	15	Decyl and octyl alcohols, ethoxyethylated	12
Cyclohexanol	03	Decyl and octyl phosphate	12
Cyclohexanone	03	Decyl oleate	11
Cyclohexanone oxime	03	Decyloxy poly(ethyleneoxy)ethyl chloride	12
Cyclohexene	03		
4-Cyclohexene-1,2-dicarboxylic anhydride	03		
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl, C ₂₁ H ₃₆ O ₄	15		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Diethylbenzene	03	Di(2-ethylhexyl) phthalate	11
Diethylcarbamazine citrate	06	Di(2-ethylhexyl) sebacate	11
Diethylcarbamoyl chloride	15	Diethyl hydrogen phosphate	15
Diethyl carbonate (Ethyl carbonate)	05	Diethylhydroxylamine	15
N,N-Diethylcyclohexylamine	03	Diethyl isophthalate	11
O,O-Diethyl O-(2-diethylamino-6-methyl-4-pyrimidinyl) phosphorothioate	13	Diethyl maleate	15
3,5-Diethyl-1,2-dihydro-1-phenyl-2-propylpyridine	03	O,O-Diethyl O-(4-(methylsulfinyl)phenyl)phosphorothioate	13
N,N'-Diethyl-N,N'-diphenylurea	03	Diethyl oxalate (Ethyl oxalate)	15
Diethylthiocarbamic acid, cadmium salt and bis (diethylthiocarbamoyl) disulfide, mixture	09	N,N-Diethyl-p-phenylenediamine	03
Diethylthiocarbamic acid, selenium salt	09	O,O-Diethyl-p-phenyl phosphorothioate	15
Diethylthiocarbamic acid, sodium salt	09	Diethyl phosphonethionic dichloride	15
Diethylthiocarbamic acid, tellurium salt	09	Diethyl phosphorochlorodithionate	15
Diethylthiocarbamic acid, zinc salt	09	Diethylphthalate	11
N,N-Diethyldodecanamide	15	Dihydropropion hydrochloride	06
Diethylene glycol	15	Diethyl sebacate	07
Diethylene glycol adipate	15	Diethyl succinate	07
Diethylene glycol borate	15	Diethyl sulfide (Ethyl sulfide)	02
Diethylene glycol chloroformate	15	1,5-Diethyl-2-thio-4,6-pyrimidinedione	15
Diethylene glycol dibenzoate	15	1,3-Diethyl-2-thiourea	15
Diethylene glycol dimethacrylate	11	N,N-Diethyltoluamide (DEET)	13
Diethylene glycol distearate	12	3,5-Diethyltoluene-2,4-diamine	03
Diethylene glycol divinyl ether	15	N,N-Diethyl-m-toluidine	03
Diethylene glycol monoester of coconut oil acids	12	N,N-Diethyl-p-toluidine	03
Diethylene glycol monoester of tall oil acids	12	O,O-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate	13
Diethylene glycol monoester of tallow acids	12	3,9-Diethyl-6-tridecyl sulfate, sodium salt	12
Diethylene glycol monolaurate	12	Diethylzinc	15
Diethylene glycol mono-1-propyl ether	15	Diforosan diacetate	06
Diethylene glycol monostearate	12	Difunisal	06
Diethylene glycol phthalate	12	1,1-Difluoroethane	15
Diethylene glycol sesquilester of tall oil acids	12	Difunctional epoxy acrylate	15
Diethylene glycol sesquilaurate	12	Diglycol dimerate	15
Diethylene glycol terephthalate	12	Di-(n-heptyl-n-nonyl) phthalate	11
Diethylenetriamine	15	Di-(n-heptyl-n-nonyl) undecyl phthalate	11
Diethylenetriamine, alkoxylated	12	Di-n-hexyl adipate	11
(Diethylenetriamine)pentamethylenephosphonic acid, sodium salt	14	Dihexyl fumarate	07
(Diethylenetriamine)pentamethylenephosphonic acid, dihydrogen ferric salt	14	Di-n-hexyl magnesium	15
(Diethylenetriamine)pentamethylenephosphonic acid, monosodium salt	14	Dihydrocarvone	07
(Diethylenetriamine)pentamethylenephosphonic acid, pentasodium salt	14	Dihydrocarumarin	07
O,O-Diethyl S-2-[(ethylthio)ethyl] phosphorodithioate (Disulfoton)	13	6,11-Dihydrodibenz(b,e)oxepin-11-one	15
O,O-Diethyl S-[(ethylthio)methyl] phosphorodithioate (Phorate)	13	2,3-Dihydro-2-dimethyl-7-benzofuranol	07
Diethylglycol amine (DEGA)	15	2,3-Dihydro-2-dimethyl-7-benzofuranol [(dibutylamino) carbamate]	03
Di(2-ethylhexyl) adipate	11	2,3-Dihydro-2-dimethyl-7-benzofuranyl methyl-tetraoxide	13
Di(2-ethylhexyl) azelate	11	2,3-Dihydro-5-(6-dimethyl-1,4-dithiain-1,1,4,4-tetraoxide)	13
Di(2-ethylhexyl) chloronate	15	2-(2-(2,3-Dihydro-1,3-dioxo-1H-inden-2-yl)-[(quinolinyl)]-6-methylbenzothiazole-7-sulfonic acid	13
Di(2-ethylhexyl) isophthalate	11	Dihydroxylalcol	07
Di(2-ethyl-1-hexyl) maleate	11	1,3-Dihydro-4 (or 5)-methyl-2H-benzimidazole-2-thione	09
Di(2-ethylhexyl) peroxycarbonate	15	2,3-Dihydro-2-(6-methyl-7-sulfo-2-benzothiazolyl)-2-quinolinyl-1,3-dioxo -1H-indene-5-carboxylic acid	07
Di(2-ethylhexyl) phosphoric acid	15	Dihydro myrcenol	03
Di(2-ethylhexyl)phosphorodithiolic acid	15	Dihydrotricyclopentadienyl acetate (Cyclacet)	07
	14	Dihydrotricyclopentadienyl propionate (Cyclaprop) (Verayl propionate extra)	07
	14		95,470

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Dihydro pentaerythritol Indanone	07	134, 200
Dihydro streptomycin	06	6, 000
Dihydro terpineol	07	95, 490
Dihydro terpinyl acetate	07	166, 367
2,3-Dihydrotrifluoromethyl-1,1-dioxide (Sulfolene)	15	58, 000
1,2-Dihydro-2,2,4-trimethylquinoline	08	69, 000
Dihydroxyaluminum aminoacetate	08	630, 000
2,4-Dihydroxybenzaldehyde	03	768, 200
3,4-Dihydroxybenzoic acid, methyl ester	03	768, 300
2,4-Dihydroxybenzophenone	15	58, 500
2,4-Dihydroxybenzophenone	03	769, 100
Di(hydroxy)bis(ammium)acetato)titanium	15	1059, 500
2,2-Dihydroxy-4,4-dimethoxybenzophenone	15	59, 000
2,3-Dihydroxy-2,2-dimethyl-7-benzofuran	13	166, 052
Dihydroxydimethyl benzophenone	15	59, 100
3,5-Dihydroxy-3,5-dimethyl-1,2-peroxydiclopentane	15	60, 000
N,N-Di(fydroxyethyl)-n-carboxymethyl tallow ammonium quat, inner salt	12	10, 320
N,N-Di(B-hydroxyethyl)-m-chloroaniline	03	771, 300
N,N-Dihydroxyethylglycine, sodium salt	14	39, 000
6,7-Dihydroxy-2-naphthalenesulfonic acid	03	774, 000
Diiodomethane (Methylene iodide)	15	1277, 000
Diiodomethyl-p-tolyl sulphone	15	63, 000
Diisobutyl adipate	11	61, 000
Diisobutyl alcohol	15	850, 700
Diisobutylaluminum chloride	15	1358, 000
Diisobutylaluminum hydride	15	1359, 000
Diisobutylamine	15	263, 000
Diisobutyl dimethoxychloro silane	15	1385, 200
Di-isobutylene (DI-isobutene)	02	747, 000
Di-isobutylene maleate	03	777, 200
Diisocetyl adipate	11	62, 000
Diisocetyl phthalate	11	30, 000
Diisonexyl phthalate	11	30, 050
Diisononaryl peroxide	15	1293, 570
Diisononyl adipate	11	62, 500
Diisononyl phthalate	11	30, 100
Diiso-octyl adipate	11	63, 000
Diiso-octyl phthalate	11	35, 000
Diisopropanolamine	15	408, 000
m-Diisopropenylbenzene	03	777, 500
Diisopropyl adipate	11	63, 200
Diisopropylamine	15	282, 000
2-Disopropylaminoethanol (N,N-Diisopropylethanolamine)	15	363, 000
2-Disopropylaminoethyl methacrylate	15	363, 000
Diisopropylaniline	03	778, 000
Diisopropylbenzene	03	778, 100
Diisopropylbenzene hydroperoxide	15	64, 000
Diisopropyl dimerate	15	968, 980
Diisopropyl hydrogen phosphite	14	272, 000
Diisopropyl ketone (2,4-Dimethyl-3-pentanone)	15	817, 000
Diisopropyl naphthalenesulfonic acid, sodium salt	12	166, 000
N,N'-Diisopropyl-p-phenylenediamine	14	181, 000
S-(O,O-Diisopropyl phosphorodithioate) ester of N-(α -mercaptoethyl)benzenesulfonamide (Bensulide)	13	58, 000
Diisopropyl sebacate	11	114, 100
Diisostearyl dimerate	15	968, 985
Diketene	15	64, 000
Dilauryl-3,3'-thiodipropionate	06	375, 650
Dilvalol hydrochloride	06	378, 400
Diltazen hydrochloride	06	80, 000
Dimethylurate	06	80, 000
Dimer acid (C ₂₈ Aliphatic dibasic acid)	15	509, 000
Dimeracidalakyl amine	12	419, 300
N-(Dimeracidalakyl)trimethylenediamine	12	407, 700
Dimer acid esters and polyesters	14	273, 000
Dimethindene maleate	16	94, 000
2,5-Dimethoxyaniline, ethoxylated	12	342, 250
2,5-Dimethoxybenzaldehyde	03	783, 000
m-Dimethoxybenzene	03	784, 000
p-Dimethoxybenzene	03	784, 500
p-Dimethoxybenzene (Dimethyl ether of hydroquinone)	15	67, 000
Dimethoxyethane (Ethylene glycol dimethyl ether)	15	1155, 000
1,1-Dimethoxy octane	15	1155, 000
3-(Dimethoxyphosphinyloxy)-N,N-dimethyl-cis-crotonamide	07	129, 690
1,2-Dimethoxy-4-propenylbenzene (4-Propenylveratrole)	13	222, 000
N,N-Dimethylacetamide	07	30, 000
N,N-Dimethylacetamide	15	236, 000
O,S-Dimethylacetylphosphoramidothioate (Acephate)	15	236, 500
Dimethyl adipate	13	222, 500
N,N-Dimethyl-N-alkylamine phosphate	11	63, 225
Dimethylamine	12	393, 200
Dimethylamine epichlorohydrin copolymer	15	288, 000
Dimethylamine epichlorohydrin ethylenediamine copolymer	15	288, 000
p-Dimethylaminobenzenediazonium chloride (p-Diazo-N,N-dimethylaniline zinc chloride)	14	417, 000
m-(Dimethylanilino)benzoic acid	14	346, 000
2-4-(Dimethylanilino)benzoylbenzochloride	03	796, 000
2-Dimethylaminoethanethiol hydrochloride	03	736, 500
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	15	365, 000
Dimethylaminoethyl acrylate, dimethyl sulfate, quaternary salt	15	366, 000
Dimethylaminoethylacrylate, methyl chloride, quaternary salt	15	367, 800
Dimethylaminoethylmethacrylate	15	367, 900
Dimethylaminoethylmethacrylate, dimethyl sulfate, quaternary salt	15	368, 000
Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	15	368, 200
Dimethylaminoethanol	15	369, 000
2-Dimethylamino-2-methyl-1-propanol hydrochloride	15	369, 500
m-Dimethylaminophenol	03	802, 000
1-(Dimethylamino)-2-propanol	15	369, 700
Dimethylaminoethylamine	15	274, 000
Dimethylaminoethylamine, propoxylated	15	369, 900

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Dimethyl phthalate	11	N,N'-Dioctadecyl-N,N'-dipropyl thuram disulfide	09
Dimethyl piperazine	15	Di-n-octyl adipate	11
1,1-Dimethylpiperidium chloride	13	Di-n-octylaluminum iodide	15
N,N-Dimethyl-1,3-propanediamine polymer with epichlorohydrin, sulfate	14	Dioctyl dimerate	15
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	15	N,N-Dioctyl-N,N-dimethyl ammonium chloride	12
Dimethyl sebacate	11	Di-tert-octyl hydroquinone	15
Dimethyl (soya alkyl) ammonium ethyl sulfate	11	Dioctyl maleate	15
N,N-Dimethyl (soybean oil alkyl) amine	12	Di-n-octyl phthalate	11
Dimethyl succinate	07	Dioctyl phthalates, all other	11
Dimethyl sulfide	02	Dioctyl tin dilaurate	15
Dimethyl sulfone	15	Dioleic acid (Ratio = 1/2)	12
N,N-Dimethyl (tallow alkyl) amine	12	Dioleoyl hydrogen phosphite	15
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	13	Dioxane (1,4-Diethylene oxide)	15
N,N-Dimethyltetradecylamine	12	1,3-Dioxolane	15
N,N-Dimethyltetradecylamine oxide	12	Di-para-benzoquinone dioxime	03
N-[5-(1-Dimethyl)-1,3,4-thiazol-2-yl]-N,N-dimethylurea (Tebuthiuron)	13	Di-para-xylene	15
Dimethyltin dichloride	13	Di-N,N'-pentamethylenethuram tetrasulfide	09
Dimethyltin diiodide	15	Dipentylamine	15
Dimethyltin-10TG	15	2,4-Di-tert-pentylphenol	03
N,N-Dimethyl-o-tolidine	15	Diphenyldramine citrate	06
N,N-Dimethyl-p-tolidine	03	Diphenyldramine hydrochloride	06
N-[2,4-dimethyl-5-[[trifluoromethyl]sulfonyl]amino]phenyl]-acetamide, diethanolamine salt	03	1,2-Diphenoxyethane	15
1,1-Dimethyl-3-(α , α , α -trifluoro-m-tolyl)urea (Flumetron)	13	Diphenoxylate	06
Dimorpholine diethyl ether	13	2-Diphenylacetyl-1,3-Indandione and sodium salt	13
Dimristyl-3,3'-thiodipropionate	15	Diphenylamine	03
N,N-Di-2-naphthyl-p-phenylenediamine	09	Diphenylamine-acetone aldehyde	03
Dinitolride	06	Diphenylamine-acetone condensate	09
m-Dinitrobenzene	03	Diphenyl-t-butylhexyl phosphite	15
2,4-Dinitrobenzenesulfonic acid, sodium salt	03	Diphenyldimethoxysilane	03
3,5-Dinitrobenzoic acid	03	Diphenyl-4,4'-diphenylmethylenedicarbamate	09
3,5-Dinitrobenzoyl chloride	03	Diphenylsulfide	03
Dinitrobutylphenol (DNBP)	13	1-Diphenylhydrazine	03
3,5-Dinitrochlorobenzenesulfonic acid, potassium salt	03	Diphenylsulfideyl phosphite	15
2,6-Dinitro-N,N-dipropyl curdlone	13	Diphenylsulfocetyl phosphite	13
3,5-Dinitro-N,N-dipropylsulfanilamide	13	Diphenylmercuric dodecenyly succinate	09
2,4-Dinitrophenol, tect	03	N,N'-Diphenyl-p-phenylenediamine (MDI)	03
2,4-Dinitrophenyl dimethyldithiocarbamate	03	Diphenylphthalate	03
p-Dinitrosalicylic acid, methyl ester	03	Diphenylsulfone sulfonic acid, potassium salt	12
2,4-Dinitrosalicylic acid, methyl ester	03	1,3-Di-4-riperidylpropane	03
2,4-Dinitrocolouline	03	Dipropandiol dibenzoate (Dipropylene glycol dibenzoate)	11
2,4-Dinitrocolouline	03	Di-n-propylaluminum chloride	15
2,4-Dinitro-6-toluic acid	03	Dipropylene glycol	15
3,5-Dinitro-6-toluic acid	03	Dipropylene glycol monomethyl ether	15
Dinonylhydroxybenzenesulfonic acid	03	Dipropylene glycol salicylate	15
Dinonylphenol, ethoxylated	03	Di-n-propylisocyanuronate	13
Dinonylphenol, ethoxylated and phosphated	12	Di-n-propylperoxydicarbonate	15
Dinonylphthalate	11	Di-N-propylphosphorodithioic acid	14
Dinoprostone	06	Dipyrrolidonylurea	02
		Direct Black 20	04
		Direct Black 80	04
		Direct Black 163	04
		Direct Black 165	04
		Direct Black 170	04
		1359.400	15
		300.000	15
		1156.000	15
		1156.500	15
		148.000	13
		148.500	13
		296.300	15
		234.000	14
		378.435	02
		613.000	04
		693.000	04
		693.163	04
		693.165	04
		693.170	04

Table D-1—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Sect. Item No.</i>
Direct black dyes, all other	04	625 000
Direct Blue 15	04	539 000
Direct Blue 22	04	540 000
Direct Blue 25	04	542 000
Direct Blue 75	04	547 000
Direct Blue 76	04	548 000
Direct Blue 80	04	550 000
Direct Blue 86	04	552 000
Direct Blue 98	04	555 000
Direct Blue 100	04	556 000
Direct Blue 108	04	557 108
Direct Blue 160	04	564 000
Direct Blue 189	04	565 000
Direct Blue 191	04	566 000
Direct Blue 199	04	567 000
Direct Blue 218	04	568 000
Direct Blue 269	04	570 259
Direct Blue 279	04	570 279
Direct Blue 281	04	570 281
Direct Blue 283	04	570 283
Direct Blue 286	04	570 286
Direct Blue 288	04	571 000
Direct Brown 41	04	606 231
Direct Brown 231	04	606 232
Direct Brown 232	04	607 000
Direct Brown 238	04	607 238
Direct brown dyes, all other	04	607 000
Direct Green 97	04	586 092
Direct green dyes, all other	04	587 000
Direct Orange 6	04	457 000
Direct Orange 8	04	458 000
Direct Orange 15	04	461 000
Direct Orange 26	04	462 000
Direct Orange 34	04	464 000
Direct Orange 39	04	466 000
Direct Orange 72	04	470 000
Direct Orange 80	04	475 000
Direct Orange 102	04	479 000
Direct Orange 116	04	479 116
Direct Orange dyes, all other	04	480 000
Direct Red 2	04	482 000
Direct Red 4	04	483 000
Direct Red 9	04	483 009
Direct Red 16	04	488 000
Direct Red 23	04	490 000
Direct Red 24	04	491 000
Direct Red 26	04	492 000
Direct Red 72	04	499 000
Direct Red 73	04	500 000
Direct Red 80	04	504 000
Direct Red 81	04	505 000
Direct Red 83	04	506 000
Direct Red 236	04	521 236
Direct Red 238	04	521 238
Direct Red 239	04	521 239
Direct Red 284	04	521 284
Direct black dyes, all other	04	522 000
Direct Violet 9	04	525 000
Direct Violet 66	04	531 000
Direct Violet 99	04	532 099
Direct Yellow 4	04	421 000
Direct Yellow 5	04	422 000
Direct Yellow 6	04	423 000
Direct Yellow 11	04	427 000
Direct Yellow 28	04	433 000
Direct Yellow 34	04	435 000
Direct Yellow 44	04	438 000
Direct Yellow 51	04	439 051
Direct Yellow 105	04	445 000
Direct Yellow 106	04	446 000
Direct Yellow 107	04	447 000
Direct Yellow 118	04	450 000
Direct Yellow 119	04	451 000
Direct Yellow 127	04	453 000
Direct Yellow 131	04	454 132
Direct Yellow 132	04	454 133
Direct Yellow 133	04	454 137
Direct Yellow 137	04	454 137
Direct Yellow 147	04	454 147
Direct Yellow 148	04	454 148
Direct Yellow 154	04	454 154
Direct yellow dyes, all other	04	455 000
N, N'-Disalicylidene-1,2-propanediamine	14	161 000
Disodium cyanodithiolmidocarbonate	13	179 000
Disopyramide phosphate	06	378 500
Disperse Black 9	04	751 000
Disperse Black 33	04	752 000
Disperse black dyes, all other	04	753 000
Disperse Blue 3	04	716 000
Disperse Blue 27	04	719 000
Disperse Blue 56	04	722 000
Disperse Blue 60	04	725 000
Disperse Blue 62	04	726 000
Disperse Blue 64	04	727 000
Disperse Blue 73	04	729 000
Disperse Blue 79	04	731 000
Disperse Blue 95	04	734 000
Disperse Blue 102	04	735 000
Disperse Blue 116	04	739 000
Disperse Blue 122	04	739 122
Disperse Blue 146	04	742 146
Disperse Blue 183	04	745 183
Disperse Blue 200	04	748 200
Disperse Blue 284	04	743 284
Disperse Blue 284	04	743 284
Disperse Blue 291	04	743 291
Disperse Blue 333	04	743 333
Disperse Blue 337	04	743 337
Disperse Blue 358	04	743 358
Disperse blue 359	04	743 359
Disperse blue 360	04	743 360
Disperse blue dyes, all other	04	744 000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Disperse Brown 1	04 746.000	Disperse Red 341	04 703.341
Disperse Brown 18	04 747.018	Disperse Red 345	04 703.345
Disperse Brown 22	04 747.022	Disperse red 358	04 703.358
Disperse brown 26	04 747.026	Disperse red dyes, all other	04 704.000
Disperse brown 27	04 747.027	Disperse Violet 1	04 705.000
Disperse Green 9	04 745.009	Disperse Violet 17	04 707.017
Disperse Orange 3	04 653.000	Disperse Violet 28	04 710.000
Disperse Orange 17	04 656.000	Disperse Violet 33	04 710.033
Disperse Orange 25 and 25:1	04 658.000	Disperse Violet 36	04 710.036
Disperse Orange 29	04 659.000	Disperse Violet 48	04 713.048
Disperse Orange 30	04 660.000	Disperse Violet 60	04 713.060
Disperse Orange 33	04 660.033	Disperse Violet 91	04 713.091
Disperse Orange 37	04 661.000	Disperse Yellow 3	04 628.000
Disperse Orange 41	04 662.000	Disperse Yellow 23	04 631.000
Disperse Orange 44 and 44:1	04 663.000	Disperse Yellow 34	04 635.000
Disperse Orange 73	04 667.073	Disperse Yellow 42	04 636.000
Disperse Orange 89	04 668.089	Disperse Yellow 54	04 638.000
Disperse Orange 94	04 668.094	Disperse Yellow 64	04 639.064
Disperse Orange 136	04 668.136	Disperse Yellow 77	04 642.000
Disperse Orange 138	04 668.138	Disperse Yellow 86	04 644.000
Disperse Orange 145	04 668.145	Disperse Yellow 88	04 646.000
Disperse orange dyes, all other	04 669.000	Disperse Yellow 108	04 650.108
Disperse Red 1	04 670.000	Disperse Yellow 114	04 650.114
Disperse Red 5	04 672.000	Disperse Yellow 126	04 651.126
Disperse Red 13	04 676.000	Disperse Yellow 198	04 651.198
Disperse Red 17	04 678.000	Disperse Yellow 219	04 651.219
Disperse Red 30	04 680.000	Disperse Yellow 238	04 651.238
Disperse Red 50	04 683.000	Disperse Yellow 239	04 651.239
Disperse Red 55	04 684.000	Disperse yellow dyes, all other	04 652.000
Disperse Red 60	04 686.000	Distearyl dimethyl ammonium methosulfate	12 456.550
Disperse Red 65	04 687.000	Distearyl-3,3'-thiodipropionate	15 949.000
Disperse Red 73	04 688.000	Distmaxane, hexakis (2-methyl-2-phenylpropyl)	13 166.011
Disperse Red 74	04 688.074	Disulfuram	06 832.000
Disperse Red 91	04 692.091	N,N'-(Di-tall oil acid)amidoethylamine	12 385.500
Disperse Red 135	04 695.135	Ditalowamidoammonium sulfate	12 487.500
Disperse red 145	04 699.145	Di-tertiary nonylpolyulfide	14 257.000
Disperse Red 153	04 699.153	2,2',...-Dithiobis(benzamide)	09 115.000
Disperse Red 159	04 700.000	2,2'-Dithiobis(benzothiazole)	09 29.000
Disperse Red 167 and 167:1	04 700.167	Dithiobis (stearyl propionate)	15 950.000
Disperse Red 177	04 701.000	2,5-Dithioburea	15 376.000
Disperse Red 179	04 702.000	Dithiocarbamic acid derivatives, acyclic, other	09 144.000
Disperse Red 195	04 703.195	Dithioglycolic acid	15 513.080
Disperse Red 263	04 703.263	4,4'-Dithiodimorpholine	09 43.000
Disperse Red 274	04 703.274	Dithiodipropionic acid	15 865.100
Disperse Red 278	04 703.278	2,5-Di-p-toluidinoterephthalic acid	15 865.100
Disperse Red 305	04 703.305	Di-tridecyl adipate	11 63.400
Disperse Red 307	04 703.307	Di-tridecyl maleate	11 951.000
Disperse Red 309	04 703.309	Di-tridecyl phthalate	11 39.000
Disperse Red 311	04 703.311	Di(tridecyl)-3,3'-thiodipropionate	15 952.000
Disperse Red 313	04 703.313	Dlundecyl phthalate	11 39.300
Disperse Red 316	04 703.316	1,5-diurdonaphthalene	03 865.800
Disperse Red 325	04 703.325	Divinylbenzene	03 865.800
Disperse Red 333	04 703.333	Divinyl tetramethylsiloxane	15 1385.500
Disperse Red 338	04 703.338	1,1-Di-3,4-xylyleneane	03 1553.200
Disperse Red 339	04 703.339	Dobutamine	06 326.200
Disperse Red 340	04 703.340	1-Docosanol (behenyl alcohol 22 carbons)	15 852.300

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	No.	Chemical name	Sect. Item No.	No.
Docosanyl docosenoate	15	989,050	Dodecylphenyl- α -naphthylamine, dioctyl diphenylamine co-polymer	14	278,000
N-(Docosyl and eicosyl)trimethylenediamine	12	408,300	Dodecyl pyrrolidinium chloride	15	74,460
Docusate, calcium	06	591,700	1-Dodecylpyridinium chloride	12	526,000
Docusate, potassium	06	591,720	Dodecyl succinic anhydride	14	204,000
Docusate, sodium	06	591,740	Dodecylsuccinic anhydride	15	185,620
n-Dodecane	15	1338,000	Dodecyl succinic lactate	15	952,800
Dodecanedioic acid	15	514,000	Dodecyl sulfate, ammonium salt	12	221,000
Dodecane nitrile	07	143,930	Dodecyl sulfate, diethanolamine salt	12	222,000
Dodecene	02	78,000	Dodecyl sulfate, N,N-diethylcyclohexylamine salt	12	223,000
Dodecyl-acetic succinimide	14	247,000	Dodecyl sulfate, isopropanolamine salt	12	224,000
Dodecyl succinic acid, benzotriazole salt	14	276,000	Dodecyl sulfate, magnesium salt	12	225,000
Dodecylsuccinic anhydride	15	165,600	Dodecyl sulfate, potassium salt	12	226,000
Dodecyl alcohol (Lauryl alcohol)	15	872,000	Dodecyl sulfate, sodium salt	12	227,000
Dodecyl alcohol, ethoxylated	12	729,000	Dodecyl sulfacetate, triethanolamine salt	12	228,000
Dodecyl alcohol, ethoxylated and phosphated	12	77,000	Dodecyl sulfacetate, sodium salt	12	199,100
Dodecyl alcohol, ethoxylated and phosphorylated	12	78,000	Dodecyl sulfonate, sodium salt	12	273,000
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	12	270,000	Dodecyltrimethylammonium chloride	12	489,000
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	12	271,000	Doxapram hydrochloride	06	550,001
Dodecylamine	12	420,000	Doxepin hydrochloride	06	527,000
Dodecylbenzene, other	03	870,000	Doxylamine succinate	06	96,000
Dodecylbenzene, straight-chain	03	869,000	Drug and Cosmetic Green 5	04	793,000
Dodecylbenzene sulfonates, all other	12	128,000	Drug and Cosmetic Green 6	04	794,000
Dodecylbenzenesulfonic acid	12	114,000	Drug and Cosmetic Green 8	04	796,000
Dodecylbenzenesulfonic acid, calcium salt	12	122,000	Drug and Cosmetic Orange 4	04	797,000
Dodecylbenzenesulfonic acid, ammonium salt	12	117,000	Drug and Cosmetic Orange 5	04	798,000
Dodecylbenzenesulfonic acid, sodium salt	12	118,000	Drug and Cosmetic Orange 17	04	799,000
Dodecylbenzenesulfonic acid, diethanolamine salt	12	119,000	Drug and Cosmetic Red 6	04	800,000
Dodecylbenzenesulfonic acid, ethylenediamine salt	12	120,000	Drug and Cosmetic Red 7	04	801,000
Dodecylbenzenesulfonic acid, isopropanolamine salt	12	121,000	Drug and Cosmetic Red 9	04	802,000
Dodecylbenzenesulfonic acid, sodium salt	12	120,000	Drug and Cosmetic Red 17	04	808,000
Dodecylbenzenesulfonic acid, monoethanolamine salt	12	122,500	Drug and Cosmetic Red 19	04	809,000
ethoxylated, salt	12	122,700	Drug and Cosmetic Red 21	04	811,000
Dodecylbenzenesulfonic acid, potassium salt	12	123,000	Drug and Cosmetic Red 30	04	813,000
Dodecylbenzenesulfonic acid, sodium salt	12	125,000	Drug and Cosmetic Red 57	04	815,000
Dodecylbenzenesulfonic acid, triethanolamine salt	12	127,000	Drug and Cosmetic Red 93	04	816,000
Dodecyl(diphenyl)oxidedisulfonic acid	12	205,990	Drug and Cosmetic Red 96	04	817,000
Dodecyl(diphenyl)oxidedisulfonic acid, disodium salt	12	206,000	Drug and Cosmetic Violet 2	04	819,000
Dodecyl disodium banaline, N-(2-carboxyethyl), sodium salt	12	10,420	Drug and Cosmetic Violet 7	04	822,000
n-Dodecylguanidine acetate (Dodine)	13	188,000	Drug and Cosmetic Yellow 7	04	823,000
Dodecylguanidine hydrochloride	13	195,011	Drug and Cosmetic Yellow 10	04	825,000
N-Dodecyl-3-mimodipropionic acid	12	10,500	Etopropanium chloride	06	573,700
N-Dodecyl-3-mimodipropionic acid, disodium salt	12	11,000	Eicosane	02	79,000
N-Dodecyl-3-mimodipropionic acid, monosodium salt	12	11,020	Enalapril maleate	06	360,100
tert-Dodecyl mercaptan, ethoxylated	12	769,000	Enflurane	06	436,500
n-Dodecyl mercaptans	06	171,000	Epichlorohydrin	15	1310,000
Dodecylmerbenzene	03	872,000	Epichlorohydrin bisphenol A, ethoxylated	12	744,500
4-(Dodecylloxy)-2-hydroxybenzophenone	15	75,000	Epichlorohydrin elastomers (CO, ECO) type	10	1,000
Dodecyl(oxypoly)ethyleneoxyacetate acid, sodium salt	12	40,000	Epoxydes, ethers, acetals, all other	15	1325,000
Dodecylpentadecyl methacrylate	12	932,700	Epoxydes esters, all other	11	80,000
n-Dodecylphenol	03	673,000	Epoxydized linseed oils	11	75,800
Dodecylphenol, ethoxylated	12	744,000	Epoxydized pentaerythritol tetraphthalate	11	75,800
Dodecylphenol, ethoxylated and phosphated	12	79,000	Epoxydized soya oils	11	76,000
Dodecylphenol, sulfured, calcium salt	14	228,000	Epoxy, resins advanced	08	6,000
Dodecylphenyl- α -naphthylamine	14	277,000			

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Epoxy resins unmodified	08	5,000
Ergocalciferol (Vitamin D ₂)	06	813,000
Eucamide	15	236,000
[Eucyl alkyl]amine	12	420,500
Eucyl stearamide	15	239,250
Erythromycin	06	46,000
Erythromycin estolate	06	46,500
Erythromycin stearate	06	46,700
Erythromycin succinate	06	46,800
Erythromycin thioacetate	06	46,900
Esters of sulfated oleic acid, all other	12	263,000
Estradiol cypionate	06	674,500
Estrogens, all other	06	679,000
Estrogens, conjugated	06	675,000
Estrogens, esterified	06	676,000
Ethanacrylic acid	06	739,000
Ethanaminium, 2-hydroxy-N,N-bis(2-hydroxyethyl)- -N-methyl-, salt with silicic acid	12	456,700
Ethanamine condensates, amine/acid ratio = 2/1, all other	12	563,000
Ethanoldiglycol, disodium salt	14	43,000
5-Ethanoxy-3-trichloromethyl-1,2,4-thiadiazole	03	873,700
Ethchlorvynol	06	468,000
Ethers and thioethers, all other	12	775,000
Ethisterone	03	873,800
Ethopabate	06	419,000
Ethosuximide	06	419,000
Ethotoin	06	420,000
N-[β -ethoxy(aryl)phenyl]-n'-ethyl-n'- phenylformamide	07	34,200
6-Ethoxy-12-dihydro-2,2,4-trimethyl quinoline	15	76,500
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	15	1159,000
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	15	1160,000
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	15	1161,000
2-(2-Ethoxyethoxy)ethyl acetate	15	1105,000
2-Ethoxyethyl acetate	15	953,000
Ethoxylated acetic acid, sodium salt	12	318,100
Ethoxylated anhydrosorbitol esters, all other	12	624,000
Ethoxylated anhydrosorbitol monolaurate	12	616,000
Ethoxylated anhydrosorbitol monooleate	12	617,000
Ethoxylated anhydrosorbitol monopalmitate	12	618,000
Ethoxylated anhydrosorbitol monostearate	12	619,000
Ethoxylated anhydrosorbitol monotrioleate	12	619,100
Ethoxylated anhydrosorbitol triesters of tall oil acids	12	621,000
Ethoxylated anhydrosorbitol trioleate	12	621,000
Ethoxylated anhydrosorbitol tristearate	12	622,000
Ethoxylated anhydrosorbitol glycol stearate	12	623,000
Ethoxylated 1,3-burylene glycol stearate	12	707,820
Ethoxylated castor oil, ditridecylmaleate	12	707,820
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	12	707,900
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	12	708,800
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	12	708,800
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	14	182,000
Ethoxylated hydantoin glycol dicocotate	14	182,000
Ethoxylated(hydrogenated tallow amine), methyl ammonium chloride	12	456,100
Ethoxylated nonylphenol laurate	12	714,630
Ethoxylated 1,2-propanediol monostearate	12	711,000
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	12	708,700
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	12	456,250
Ethoxylated sorbitol beeswax ester	12	625,000
Ethoxylated sorbitol hexaester of tall oil acids	12	627,000
Ethoxylated sorbitol hexaoleate	12	628,000
Ethoxylated sorbitol lanolin ester	12	629,000
Ethoxylated sorbitol mono-oleate	12	630,000
Ethoxylated sorbitol monostearate	12	631,000
Ethoxylated sorbitol oleate, acetylated	12	631,500
Ethoxylated sorbitol pentaoleate	12	633,000
Ethoxylated sorbitol tetraester of lauric and oleic acids	12	635,000
Ethoxylated sorbitol tetraester of tall oil acids	12	636,000
Ethoxylated sorbitol tetraoleate	12	636,400
Ethoxylated sorbitol tetraesterate	12	636,500
Ethoxylated tallow amine, potassium propionate derivative	12	458,500
1-Ethoxy-3-methylbenzene	03	877,700
4-Ethoxy-2-methyl-N-phenylaniline	03	877,900
3-Ethoxypropionitrile	15	440,000
Ethyl acetate (100% basis)	15	954,001
Ethyl acetate	15	956,000
Ethyl acrylate	15	936,000
Ethyl acrylate methacrylic acid copolymer	14	49,000
Ethyl alcohol, phosphated, amine salt	15	86,700
Ethyl alcohol, synthetic only	15	853,000
Ethylaluminum dichloride	15	1360,000
Ethylaluminum sesquichloride	15	1361,000
Ethylamine, mono-	15	278,000
2-Ethylaminoethanol (Ethylmonoethanolamine)	15	385,000
2-[Ethylamino]-4-[isopropylamino]-6-(methylthio) -s-triazine (Armetryne)	13	69,000
o-Ethylaniline	03	892,500
o-Ethylaniline, refined	03	893,000
2-(N-Ethylanilino)ethanol	03	894,000
3-(N-Ethylanilino)propionitrile	03	886,000
α -(N-Ethylanilino)-m-toluenesulfonic acid	03	887,000
Ethyl anthranilate	07	35,800
Ethylbenzene	03	892,000
Ethylbenzoate	07	35,900
Ethyl benzoyl dimethyl(mixed alkyl)ammonium chloride N-Ethyl-N,N-bis(polyoxyethylene)tallow ammonium ethyl sulfate	12	527,000
Ethyl butyrate	07	458,850
Ethyl caprate	07	144,000
Ethyl caprylate	07	144,100
Ethyl cellulose	08	21,030
Ethyl chloride (Chloroethane)	15	1233,000
Ethyl chloroformate	15	939,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	No.	Chemical name	Sect. Item No.	No.
Ethyl 2-[[[4-(chloro-6-methoxypropylidino-2-yl)-amino] carbonyl]amino]sulfonyl]benzoate (Chlorimuron ethyl)	13	69,025	Ethylene glycol diacrylate	15	1106,200
Ethyl chlorothioformate	15	959,600	Ethylene glycol dimercaptoacetate	15	1107,000
Ethyl citramate	07	36,000	Ethylene glycol dimethacrylate	15	1108,000
Ethyl cyanacetate	15	387,000	Ethylene glycol distearate	12	638,000
Ethyl-2-cyano-3-diphenyl acrylate	15	77,800	Ethylene glycol di- <i>tri</i> -ethyl ether	15	1161,760
2-(<i>N</i> -Ethyl- <i>N</i> , β -cyanoethyl)-4-acetaminoisole	03	895,100	Ethylene glycol esters, all other	15	642,000
Ethyl cyclohexylamine	15	78,100	Ethylene glycol mono-oleate	12	639,000
S-Ethyl cyclohexylmethylthiocarbamate	13	69,100	Ethylene glycol monostearate	12	640,000
S-Ethyl 3- <i>[(</i> t-butyl)peroxy] butyrate	15	1296,320	Ethylene glycol sesquistearate	12	641,000
S-Ethyl diisobutylthiocarbamate (Butylate)	13	202,500	Ethylene oxide	15	1312,000
Ethylidene (mixed alkyl) ammonium ethyl sulfate	12	490,000	Ethylene-propylene copolymer	14	279,000
S-Ethyl dipropylthiocarbamate (EPTC)	13	202,000	Ethylene-propylene (EP) type	10	10,000
Ethylene-acrylic acid resins (EAA)	02	40,000	Ethylene-vinyl acetate (EVA) copolymer resins	08	31,700
Ethylene bis(dithiocarbamic acid), disodium salt (Nabam)	08	31,900	Ethyl- α , β -epoxy- β -methylhydroxycinnamate	07	97,000
Ethylene bis(dithiocarbamic acid), disodium salt with zinc ions	13	183,000	Ethyl ethers of tetra and higher ethylene glycols (high boiling)	15	1313,000
Ethylene bis(dithiocarbamic acid), manganese	13	184,500	Ethyl 3-ethoxy propionate	15	1161,400
Ethylene bis(dithiocarbamic acid), zinc and manganese salts	13	187,010	Ethyl formate	07	144,500
<i>N</i> , <i>N</i> '-Ethylenbis-oleamide (Oleic acid-ethylenediamine condensate (Amine:acid ratio = 1/2))	15	240,000	α -Ethyl furfuryl alcohol	15	81,900
<i>N</i> , <i>N</i> '-Ethylenbis (stearamide)	15	241,000	4-Ethyl furate	07	95,700
Ethylene bis tetrabrom	15	1212,800	4-Ethyl guaiaac	07	95,710
Ethylene carbonate	15	961,000	1-Ethyl-2-(β -heptadecenyl)-1-(2-hydroxyethyl)-2-imidazolium ethyl sulfate	12	460,000
Ethylene diamine	08	36,230	Ethyl hexadecyldimethylammonium bromide	07	145,000
Ethylene diamine dithiodiide	06	583,000	N-Ethyl- <i>N</i> -hexadecylmorpholinium ethyl sulfate (Mollinate)	12	461,000
Ethylene diamine ethoxalide	12	328,455	S-Ethyl-hexahydro-1 <i>H</i> -azepine-1-carbothioate	13	70,000
Ethylene dibromide	14	182,000	2-Ethylhexanal (α -Ethylcaproaldehyde)	15	789,000
(Ethylenedinitrilo)tetraacetic acid (Ethylenediaminetetraacetic acid) (EDTA)	14	47,000	2-Ethyl-1,3-hexanediol	15	1082,000
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	14	49,000	Ethyl hexanoate	07	146,000
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	14	50,000	2-Ethylhexanoic acid (α -Ethylcaproic acid)	15	519,000
(Ethylenedinitrilo)tetraacetic acid, dipotassium salt	14	51,500	2-Ethylhexanoic acid salts, all other	15	646,000
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	14	54,000	2-Ethyl-1-hexanol	15	884,000
(Ethylenedinitrilo)tetraacetic acid, disodium salt	14	53,000	2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated	12	60,090
(Ethylenedinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	14	56,000	2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated, sodium salt	12	80,100
(Ethylenedinitrilo)tetraacetic acid, magnesium salt	14	57,000	2-Ethylhexanol, ethoxylated and phosphated	12	80,050
(Ethylenedinitrilo)tetraacetic acid, manganese salt	14	58,000	2-Ethylhexanoyl chloride	15	520,000
(Ethylenedinitrilo)tetraacetic acid, monoammonium ferric salt	14	59,000	2-Ethyl-1-hexyl acetate	15	962,000
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	14	60,000	2-Ethyl-1-hexyl acrylate	15	963,000
(Ethylenedinitrilo)tetraacetic acid, tetraammonium salt	14	61,000	(2-Ethylhexyl) amine, mono-	08	19,970
(Ethylenedinitrilo)tetraacetic acid, tetrapotassium salt	14	62,000	2-Ethylhexyl benzoate	15	281,000
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	14	63,000	<i>N</i> -(2-Ethylhexyl)bicyclo(2.2.1)-5-heptene-2,3-dicarboximide	15	79,000
(Ethylenedinitrilo)tetraacetic acid, trisodium salt	14	64,000	2-Ethylhexyl chloride	13	173,000
1,1-Ethylenedurea	15	388,200	2-Ethylhexyl chloroformate	15	1237,000
Ethylene glycol	15	1081,000	2-Ethylhexyl-2-cyano-3-diphenyl acrylate	15	963,600
Ethylene glycol adipate	11	63,450	2-Ethylhexyl cyclohexyl pthalate	11	39,450
Ethylene glycol diacetate	15	1106,000			

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
2-Ethylhexyl-1-p-dimethylaminobenzoate	15	Ethyl salicylate	07
2-Ethylhexyl epoxystalates	11	N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	12
2-Ethylhexyl glycidyl ether	15	N-Ethyl succinyl chloride	15
2-Ethylhexyl hydrogen phosphate	15	Ethyl sulfate (Diethyl sulfate)	15
2-Ethyl-1-hexyl methacrylate	15	N-Ethyl-p-toluenesulfonamide	11
2-Ethylhexyl-p-methoxy cinnamate	07	N-Ethyl-m-toluidine	03
2-Ethylhexyl-p-methoxy cinnamate	15	3-(N-Ethyl-m-toluidino)propionitrile	03
2-Ethylhexyl oleate	10	Ethyl trimethyl cyclopentyl buterol	07
2-Ethylhexyl palmitate	11	Ethyl 3,7,11-trimethyldeca-2,4-dienoate	13
2-Ethylhexyl phosphate	12	Ethyl valerate	07
2-Ethylhexyl phosphate, potassium salt	12	Ethyl vinyl ether	15
2-Ethylhexyl phosphate, sodium salt	12	1-Ethyl-1-cyclohexanol	03
2-Ethylhexyl polyphosphate, sodium salt	12	Etidronate, disodium	06
2-Ethylhexyl salicylate	07	Expandable polystyrene beads	08
2-Ethylhexyl stearate	11	External Drug and Cosmetic Orange 3	04
2-Ethylhexyl stearate	11	External Drug and Cosmetic Yellow 7	04
2-Ethylhexyl sulfate	12	Famotidine	06
p-Ethyl(2-hydroxyethyl)amino benzendiazonium chloride-diazo-n-hydroxyethyl(amine zinc chloride)	14	Fats and oils, chemically modified, all other	15
5-(N-Ethyl-N-hydroxyethylamino)-2-pentanone	15	Fatty acid, alkanolamine ester	15
(N-Ethyl-N-(2-hydroxyethyl)-3-methylenedehydrogen sulfate) p-phenylenediamine	14	Fatty acid amide mixtures	15
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	14	Fatty acid esters, not included with plasticizers	15
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	15	Surface-active agents, all other	15
Ethylidene norbornene	15	Fatty acid polyamine condensate	14
Ethyl isobutyrate	07	Fatty acid residues	15
Ethyl isovalerate	07	Fatty acids, hydrogenated	15
Ethyl laurate	07	Fatty acids, mixed chain length, synthetic	15
Ethyl mercaptan (Ethanethiol)	02	Fatty acids, non-hydrogenated	15
2-(Ethymercaptop)ethanol	15	Fatty acids, partially hydrogenated	15
Ethyl methacrylate	15	Fatty amines	15
N-Ethyl-2-methylallylamine	15	Fenoprofen	06
6-Ethyl-2-methylallylamine	03	Fenopropyl citrate	06
Ethyl-2-methyl butyrate	07	Fish oil, C ₁₄ -C ₂₂ merhaden, lead salts	15
Ethyl-2-methyl pentanoate	07	Flavoxate hydrochloride	15
2-Ethyl(3-methylphenyl)amino] ethanol	03	Flotation reagents, all other	14
N-[3-(1-Ethyl-1-methylpropyl)-5-isoxazolyl]-2,6-dimethoxybenzamide (Flexidor)	03	Fludrocortisone acetate	06
O-Ethyl O-[4-(methylthio)phenyl] S-propyl phosphordithioate	13	Flunixin	06
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	13	Fluorelaxomers (CFM, FKM, FFKM) type	10
4-Ethylmorpholine	15	9-Fluorenone	10
Ethyl myristate	07	Fluorescent Brightener 290	03
2-Ethyl-2-nitro-1,3-propanediol	15	Fluorescent Brightener 22	04
Ethyl nonanoate	07	Fluorescent Brightener 28	04
Ethyl octanoate	07	Fluorescent Brightener 22	04
Ethyl phenylacetate	07	Fluorescent Brightener 46	04
N-Ethyl-N-phenylbenzylamine	03	Fluorescent Brightener 49	04
Ethyl(polyoxyethylene, cococamine) ethylsulfate	12	Fluorescent Brightener 52	04
N(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzamine	07	Fluorescent Brightener 61	04
3-Ethylpyridine	03	Fluorescent Brightener 71	04
5-Ethyl-2,3-pyridinedicarboxylic acid	03	Fluorescent Brightener 102	04
N-Ethyl pyrrolidone	15	Fluorescent Brightener 114	04
		Fluorescent Brightener 128	04
		Fluorescent Brightener 134	04
		Fluorescent Brightener 191	04
		Fluorescent Brightener 205	04
		Fluorescent brighteners, all other fluorinated (including other fluorohalogenated)	04
		Fluorocarbon resins, all other	15
			08
			39,000
			463,000
			1,327,300
			966,000
			808,000
			911,000
			150,250
			231,016
			153,000
			136,000
			913,000
			837,001
			44,010
			827,000
			829,000
			620,400
			1,331,000
			392,500
			242,100
			981,000
			280,000
			1434,300
			521,000
			522,001
			522,000
			523,000
			282,000
			401,200
			401,250
			646,700
			745,500
			147,000
			656,000
			401,280
			11,000
			913,520
			780,290
			756,000
			781,000
			785,000
			786,000
			777,000
			771,000
			773,000
			775,114
			778,000
			780,191
			780,205
			781,000
			1276,000
			38,200

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
Fluorometholone	06	657,000	α -Gluconamidopropyl dimethyl-2-hydroxyethyl ammonium chloride	12	471,500
Fluoxetine	06	527,400	Gluconic acid, potassium and sodium salts W/20% mix of sodium bisulfite-formaldehyde	12	57,530
Fluoxymesterone	06	640,000	Gluconic acid and salts, mixed	15	1434,800
Fluphenazine hydrochloride	06	485,000	Gluconic acid, technical	15	526,000
Flutamide	06	692,700	Glucose oxidase	14	124,000
Food, Drug, and Cosmetic Blue 1	04	783,000	Glucose-6-phosphate dehydrogenase	14	8,000
Food, Drug, and Cosmetic Blue 2	04	784,000	Glutamic acid hydrochloride	14	8,000
Food, Drug, and Cosmetic Green 3	04	786,000	Glutaryl-p-nitroamine (liver function test)	06	576,500
Food, Drug, and Cosmetic Red 3	04	787,000	Glutaraldehyde	15	193,000
Food, Drug, and Cosmetic Red 4	04	787,040	Glutaraldehyde bis (sodium bisulfite)	15	322,000
Food, Drug, and Cosmetic Red 40	04	789,005	Glutaric acid	15	526,900
Food, Drug, and Cosmetic Yellow 5	04	790,000	Glutaric acid esters, all other	11	85,950
Food, Drug, and Cosmetic Yellow 6	04	791,000	Glutethimide	06	471,000
Formaldehyde (37% HCHO by Weight)	12	780,500	Glycerides, C ₁₄₋₁₈ and C ₁₆₋₁₈ mono- and di-	15	1110,400
Formaldehyde, dicyandiamide, ethylene sulfate polymers	15	487,000	Glycerides, mono, mixed	15	1110,430
Formaldehyde polymer with carbamate esters	12	780,500	Glycerine, alkoxylated	12	761,700
Formaldehyde polymer with ethylenediamine and nonyl phenol derivatives	14	163,000	Glycerine, ethoxylated	12	761,710
1-Formylpiperidine	03	919,153	Glycerine, ethoxylated and propoxylated	12	761,720
Fuel additives, acyclic, all other	14	177,000	Glycerol, alkoxylated, toluene diisocyanate copolymer	12	761,800
Fumaric acid	15	525,000	Glycerol, alkoxylated, toluene diisocyanate copolymer	12	643,000
Fumaric acid, lead salt	15	687,000	Glycerol diacetyl/tartrate mono-oleate	12	644,000
2-Furaldehyde (Furfural)	03	922,000	Glycerol diacetyl/tartrate monostearate	12	659,960
Furan	03	920,000	Glycerol diester of coconut oil acids	12	659,500
Furan derivatives, all other	15	94,000	Glycerol diaurate	12	651,000
Furfuryl alcohol	03	921,000	Glycerol esters of chemically defined acids, all other	12	659,000
Furfuryl alcohol, ethoxylated	03	744,600	Glycerol esters of mixed acids, all other	12	668,000
Furfurylamine	03	921,102	Glycerol, ethoxylated	12	729,700
Furfuryl type resins	09	82,400	Glycerol, ethoxylated and phosphated	12	111,900
Furolic acid	15	7,000	Glycerol kinase	14	125,000
Furosemide	06	739,450	Glycerol mono- and diesters of mixed fatty acids	12	648,800
1-(2-Furyl)piperazine	03	920,200	Glycerol mono-, di-, and triesters of hydrogenated tallow acids	12	667,000
Galactose	14	456,000	Glycerol monoester of C ₂₀ -C ₂₆ acids	12	660,900
Galaxolide (1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethyl-cyclopenta- γ -2-benzopyran)	07	96,000	Glycerol monoester of coconut oil acids	12	661,000
Gasoline additives, acyclic, all other	14	189,000	Glycerol monoester of coconut oil acids, sulfated, sodium salt	12	267,000
Gasoline additives, cyclic, all other	14	190,000	Glycerol monoester of cottonseed oil acids	12	662,000
Gentibrozil	06	620,500	Glycerol monoester of hydrogenated cottonseed oil acids	12	663,000
Gentamicin	07	151,000	Glycerol monoester of hydrogenated lard acids	12	663,500
Geranyl acetate	07	48,000	Glycerol monoester of hydrogenated soybean oil acids	12	664,000
Geranyl benzoate	07	151,000	Glycerol monoester of lard acids	12	665,000
Geranyl butyrate	07	40,200	Glycerol monoester of mixed fatty acids, acetylated	12	649,000
Geranyl crotonate	07	153,001	Glycerol monoester of mixed fatty acids, phosphated	12	649,100
Geranyl ethyl ether	07	153,007	Glycerol monoester of palm oil acids	12	666,200
Geranyl formate	07	153,010	Glycerol monoester of palm oil acids	12	666,200
Geranyl isobutyrate	07	153,020	Glycerol monoester of tall oil acids	12	666,300
Geranyl isovalerate	07	153,060	Glycerol monoester of tall oil acids	12	666,400
Geranyl myristate (Citralva)	07	153,560	Glycerol monoester of tallow acids	12	665,000
Geranyl prolonate	07	153,600	Glycerol mono-oleate	12	656,000
Geranyl tiglate	07	153,800	Glycerol mono-oleate, ethoxylated	12	650,100
Gibberellic acid	13	688,450	Glycerol monostearate	12	658,000
Glibenclamide	06	688,000	Glycerol monostearate sulfacetate, sodium salt	12	200,000
Glucoamylase	14	96,000			
Glucoheptonic acid, β -isomer, sodium salt	14	65,000			
Glucoheptonic acid, sodium salt	14	66,000			

Table D-1—Continued
Alphabetical chemical Index

<i>Chemical name</i>	Sect. Item No.	Item No.	<i>Chemical name</i>	Sect. Item No.	Item No.
Glycerol propoxylate triacrylate	15	1110.600	n-Heptyl alcohol	15	856.000
Glycerol sesquilester of hydrogenated tallow acids	12	687.400	2-Hydroxycyclopentanone	07	96.500
Glycerol, synthetic only	15	1084.000	Herring oil, sulfated	12	288.490
Glycerol triester of mixed fatty acids	12	687.900	Herring oil, sulfated, sodium salt	12	299.000
Glycerol trisulfate/decanoate	12	658.400	Hexacillin, potassium	06	15.200
Glycerol p-aminobenzoate	15	86.000	Hexabromocyclodecane	15	87.800
Glycerol diacetate (Diacetin)	15	1111.000	Hexachlorocyclopentadecane	03	924.000
Glycerol monoacetate (Monoacetin)	15	1112.000	1,4,5,6,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendic anhydride)	03	925.100
Glycerol monoricinoleate	11	108.000	Hexadecane	15	1342.000
Glycerol monothioglycolate	15	1113.000	1-Hexadecanol (Cetyl alcohol)	15	873.000
Glycerol triacetate (Triacetin)	15	1114.000	Hexadecanolide	07	96.600
Glycerol tri(acetylricinoleate)	11	109.000	Hexadecyl alcohol, ethoxylated	12	730.000
Glycerol triacetyl stearate	11	120.000	Hexadecyl alcohol, propoxylated	12	730.015
Glycerol tribenzoate	11	91.000	Hexadecylamine	12	421.000
Glycerol trioleate (Triolein)	11	83.000	Hexadecyldiphosphate	12	99.500
Glycerol tripropionate	11	83.000	Hexadecylmonophosphate	12	99.520
Glycerol tristearate	15	1115.500	N-Hexadecylmorpholine	12	347.000
Glycol (2,3-Epoxy-1-propanol)	15	1377.000	Hexadecyl stearate	11	121.310
α -Glycidoxypropyltrimethoxysilane	15	1317.000	Hexadecyl sulfate, sodium salt	12	230.000
Glycidyl ethers, all other	15	1317.500	Hexadecylsulfonfyl chloride	15	1335.020
Glycine (Aminoacetic acid), non-medical	14	10.000	Hexadecyltrimethylammonium bromide	12	494.000
Glycolic acid (Hydroxyacetic acid)	15	528.000	Hexadecyltrimethylammonium chloride	12	495.000
Glycolic acid, potassium salt	15	663.750	Hexafluoropropylene, monomer	15	1267.000
Glycolic acid, sodium salt	15	664.000	Hexaglycerol	12	691.947
Glycol pelargonate	11	84.000	Hexahydro-5-methoxy-4,7-methano-1H-indene	07	40.300
Glycol residues	15	1435.000	Hexahydro-1,3,5-triethyl-s-triazine	13	40.012
Glycopyrrrolate	06	288.500	Hexahydro-1,3,5-tri(2-hydroxyethyl)-s-triazine	13	40.022
Glyoxal	15	793.000	Hexamethyldisilazane	15	1387.500
Glyoxal-formaldehyde resins	08	7.500	Hexamethylenediamine adipate (Nylon salt)	15	397.000
Gold sodium thiomalate	06	401.300	Hexamethylenediaminetetra(methylenephosphonic acid), potassium salt	14	68.000
Gonacorelin, acetate	06	692.900	Hexamethylene-1,6-dicyocyanate (HD1)	15	397.100
Graesse, other than wool, sulfated, sodium salt	12	292.000	Hexamethylene- α ,6-dicyocyanate biurets (HD1-biurets)	15	397.150
Guaiacwood acetate	07	96.100	Hexamethylene-1,6-dicyocyanate trimers (HD1 trimers)	15	397.200
Guaiacwood	07	96.100	Hexamethylenimine	03	977.870
Guaiacresin	15	396.000	Hexamethylenetetramine, tech	05	68.000
Guandinine, hydrochloride	06	659.500	N-Hexanal	07	155.310
Halenolide	12	318.300	Hexane	02	65.000
Half-phthalic acid ester of tallow	06	500.800	1,6-Hexamethylenediamine (Hexamethylenediamine)	15	293.000
alkanoamide/monoglyceride	07	80.500	1,6-Hexamethylol diacrylate	15	1095.000
Haloperidol	07	80.500	2-Hexenal	15	117.000
Heliotropyl acetate	07	80.520	1-Hexenal	02	155.300
Heliotropyl acetone	07	80.520	1-Hexenal, mixed	02	67.015
Heptachloro-tetrahydro-endo-methanohindene	13	136.000	Hexenes, mixed	02	67.020
(Heptachlorin)	13	136.000	2-H-Hexeno	07	155.400
2-Heptadecyl-1,4-hydroxymethyl-4-ethyl-2-oxazoline	12	345.950	cis-3-Hexenyl-1-yl acetate	07	125.650
2-Heptadecyl-2-midcazoline	12	410.000	cis-3-Hexenyl butyrate	07	155.653
Heptadecylmethylbenzimidazolinesulfonic acid, sodium salt	12	26.000	cis-3-Hexenyl methyl carbonate	07	155.654
Heptadecyl- <i>o</i> -aniline condensate	09	6.000	cis-3-Hexenyl salicylate	07	155.656
n-Heptane	02	71.000	cis-3-Hexenyl tiglate	07	155.656
Heptanoic acid	15	528.500	Hexoxyacetaldenide dimethyl acetal	07	155.700
Heptanoic acid, potassium salt	12	371.550	Hexyl acetate	15	984.700
Heptanobacil	07	194.600	Hexyl acetate	15	195.705
2-Heptanone (Methyl aryl ketone)	02	819.000	n-Hexyl alcohol	15	857.000
Heptenes, mixed	02	72.000			

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
n-Hexylamine	15	284,000
Hexylamine ethoxylate	15	398,000
Hexyl caproate	07	155,710
Hexyl (isononyl amide) carboxylic acid, mono, triethanolamine salts	12	57,560
α-Hexylcinnamamide	07	41,000
Hexyl n-decyl phthalate	11	44,000
Hexyl (isononyl amide)carboxylic acid, triethanol-dithanolamine, mixed salts	12	57,565
Hexyl 2-methylbutyrate	14	149,000
Hexyl nitrate	15	1164,000
2-[2-(Hexyloxy)ethoxy]ethanol	12	207,000
Hexyl(oxypropyl)sulfonic acid, sodium salt	12	328,600
Hexyl oxypropyl amine	12	99,900
Hexyl phosphate, potassium salt	12	99,910
Homomethyl salicylate	15	893,000
Humatrope	06	357,000
Hydralazine hydrochloride	06	42,000
Hydratropaldehyde	07	43,000
Hydratropaldehyde, dimethyl acetal	07	43,000
Hydrazine acetate	15	594,500
Hydrindantin	15	91,000
Hydrocarbon carboxylic acid derivatives (specify hydrocarbon derivatives)	14	205,000
Hydrocarbon derivatives all other hydrocarbon derivatives	02	97,000
Hydrocarbon phosphorus acid, barium salt	14	206,000
Hydrocarbon phosphoryl derivatives	14	207,000
Hydrocarbons, all other	15	1349,000
Hydrocarbons, C ₄ , all other	02	52,000
Hydrocarbons, C ₆ , all other	02	59,000
Hydrocarbons, C ₈ , all other	02	68,000
Hydrocarbons, C ₉ , all other	02	73,000
Hydrocarbons, C ₇ , all other	02	77,000
Hydrocarbons, C ₉ and above, all other, including mixtures	02	89,000
Hydrocarbons, C ₄ fraction	02	51,200
Hydrocarbons, C ₂ -C ₆ mixtures	02	43,000
Hydrocarbons, C ₂ mixtures	02	49,600
Hydrocarbons, C ₃ mixtures	02	58,500
Hydrocarbons, C ₅ -C ₆ mixtures	02	67,030
Hydrocarbons, C ₅ -C ₇ mixtures	02	67,040
Hydrochlorothiazide	06	722,000
Hydrochloric acid	07	43,500
Hydrocodone bitartrate	06	433,000
Hydrocodone	06	680,000
Hydrocortisone	06	661,000
Hydrocortisone acetate	06	44,000
Hydrocortisone	07	44,000
Hydrogenated castor oil, ethoxylated	12	670,000
Hydrogenated menhaden fish oil	15	1329,050
Hydrogenated tallow acids, aminoethylethanolamide, acetate salt	12	575,280
(Hydrogenated tallow alkyl)amine	12	492,000
(Hydrogenated tallow alkyl)amine acetate	12	384,000
(Hydrogenated tallow alkyl)amine, ethoxylated	12	329,000
Chemical name	Sect. Item No.	Sect. Item No.
(Hydrogenated tallow alkyl)trimethylammonium chloride	12	498,000
Hydrogenated tallow amides, ethoxylated	12	575,200
1-(2-Hydrogenated tallow amidoethyl)-2-nor	15	386,500
(Hydrogenated tallow)-2-Imidazoline	15	1329,000
Hydrogenated tallow glycerides	15	91,250
Hydrogenated tallow glycerides diethylenediamine condensate	12	587,943
Hydrolytic enzyme mixtures	14	113,000
Hydromonophone hydrochloride	06	401,400
Hydroquinone (Hydroquinol)	14	357,000
Hydroquinone, di(β-hydroxyethyl) ether	15	91,250
Hydroquinone, tech.	03	934,000
p-Hydroxybenzaldehyde	03	943,000
p-Hydroxybenzenesulfonic acid	03	944,000
p-Hydroxybenzoic acid	03	946,000
p-Hydroxybenzoic acid, butyl ester	15	92,000
p-Hydroxybenzoic acid, ethyl ester	15	93,000
p-Hydroxybenzoic acid, methyl ester	15	94,000
4-Hydroxy-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	15	95,000
4-Hydroxybenzylbenzene	03	947,000
4-Hydroxybenzylbenzene	03	948,000
Hydroxychloroquine sulfate	06	175,000
Hydroxychloroquine methyl anthranilate	07	44,050
Hydroxycitronellol	07	156,500
2-Hydroxy-5,9-dimethyl-6,7-benzomorphan	03	953,550
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	07	156,000
(Hydroxycitronellal, dimethyl acetal)	07	157,000
Hydroxyethane-1-diphosphonic acid	14	69,000
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	07	44,100
Hydroxyethyl acrylate	15	1119,000
2,2,[(4-(2-Hydroxyethylamino)-3-nitrophenyl)imino diethanol	03	955,700
3-[N-(2-Hydroxyethyl)anilino]propionitrile	03	956,000
Hydroxyethylcellulose	14	409,000
N-β-Hydroxyethyl-2,4-dihydroxybenzamide	03	958,000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl) ammonium dihydrogen phosphate	12	472,000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl) ammonium nitrate	12	474,000
N-(2-Hydroxyethyl)-1,2-diphenylethylenediamine	12	351,000
(N-Hydroxyethyl)ethylenedinitrilo triacetic acid, iron salt	14	72,000
(N-Hydroxyethyl)ethylenedinitrilo triacetic acid, magnesium salt	14	73,000
(N-Hydroxyethyl)ethylenedinitrilo triacetic acid, trisodium salt	14	74,000
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-capryl-2-imidazolium hydroxide	12	26,600
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	12	26,700
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-oleyl-2-imidazolium hydroxide	12	26,800
N-(2-Hydroxyethyl)-1,2-hydroxystearamide	15	399,200

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sect. Item No.	Sect. Item No.
Hydroxyethylidene diphosphonic acid, potassium salt	14	75,000
Hydroxyethylidene diphosphonic acid, sodium salt	14	76,000
Hydroxyethyl methacrylate	15	119,200
1-(2-Hydroxyethyl)-2-nonyl-2-imidazole	12	348,000
1-(2-Hydroxyethyl)-2-nor(1 cocouit oil alkyl)-2-imidazole	12	349,000
1-(2-Hydroxyethyl)-2-nor(1 soy oil alkyl)-2-imidazole	12	351,800
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazole	12	350,000
2-Hydroxyethyl n-octyl sulfide	13	233,010
N-(Hydroxyethyl)piperazine	15	96,000
3-Hydroxy-2-ethyl-4-pyrone (Ethylmaltol)	07	97,000
1-(2-Hydroxyethyl)-1-(sodium carboxymethyl)eneoxyethylene)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	12	26,900
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazole, fatty acid salt	12	351,700
N-(2-Hydroxyethyl)-N,N',N''-tris(2-hydroxypropyl)-ethylene diamine	12	330,000
Hydroxyethyl-2-undecyl-2,3-imidazole	12	464,000
2-Hydroxy, 3-(lauryl-myrtilol)oxy-1 propane sulfonic acid, sodium salt	12	207,050
4-Hydroxy-3-methoxybenzaldehyde (Vanillin)	07	44,800
2-Hydroxy-4-methoxybenzophenone	15	97,000
2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid	15	97,010
4(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanilacetone)	07	44,800
2-(Hydroxymethyl)amino-2-methylpropanol	13	245,014
4-Hydroxy-2-methyl-2H-1,2-benzothiazine	03	969,050
-3-carboxylic acid, methyl ester, 1,1-dioxide	03	
2-Hydroxymethylene-17 α -ethinylandrost-17 β -ol-4-en-3-one	03	969,010
2-(Hydroxymethyl)ethanol	13	245,012
N-(Hydroxymethyl)-formamide	15	244,950
Hydroxymethyl-5,5-hydantoin	15	99,500
Hydroxymethyl(methyl)dithiocarbamic acid, potassium salt	13	185,500
4-Hydroxymethyl-4-methyl-1-phenyl-3-pyrzolidone	14	360,000
2-(Hydroxymethyl)-2-methyl-1,3-propanediol (Trimethylethane)	15	1086,000
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tris-(hydroxymethyl)nitromethane)	15	401,000
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	15	823,000
4-(4-Hydroxy-4-methyl pentyl)-3-cyclohexene-10-carboxaldehyde (Lyral)	07	97,200
3-Hydroxy-2-methyl-4-pyrone (Maltol)	07	98,000
3-Hydroxy-N-(3-N-morpholino- γ -propyl)-2-naphthimide	03	972,500
6-Hydroxy-2-naphthalenesulfonic acid, sodium salt	03	987,000
1-Hydroxy-2-naphthoic acid	03	990,000
3-Hydroxy-2-naphthoic acid (B. O. N.)	03	992,000
1-Hydroxy-2-naphthoic acid, ethanamide	03	992,302
1-Hydroxynaphthoic acid, methyl ester	03	993,000
3-Hydroxy-2-naphthoic acid methyl ester	03	993,000
3-Hydroxy-2-naphthoic acid, sodium salt	03	994,802
4-Hydroxynaphonic acid, γ -lactone (γ -Nonalactone)	07	99,000
1-Hydroxy-6-octadecyloxy-2-naphthoic acid	03	1000,302
2-Hydroxy-4-N-octoxybenzophenone	15	99,750
p-Hydroxy phenylbutanone	07	44,850
α -D-p-Hydroxyphenylglycine methyl ester K	15	100,200
Hydroxyprogesterone caproate	06	679,800
Hydroxy-2-propanone (Acetol)	07	157,100
Hydroxypropyl acrylate	15	1120,000
Hydroxypropyl ammonium cyano acetate	12	497,800
2-Hydroxypropyl cellulose	14	410,000
Hydroxypropyl guar gum	14	421,000
Hydroxypropyl methacrylate	15	1121,000
N-2-hydroxy propyl-n-methyl-N,n-bis(tallow amide ethyl ammonium ethyl sulfate	12	474,190
8-Hydroxy-5-quinolinesulfonic acid	06	261,000
4-Hydroxyundecanoic acid, γ -lactone (Y-Undecalactone)	07	101,000
Hydroxyazine hydrochloride	06	501,000
Hydroxyazine pamoate	06	502,000
Hygromycin B	06	66,000
Hypnotics and sedatives, other than barbiturates, all other	06	475,000
buiproten	06	401,500
2-Imidazole-1-(2-aminoethyl)-2-(tall oil alkyl), etoxylated	12	330,050
Imidazole from tall oil fatty acids and diethylethylamine	12	330,050
Imidazolium, 1-carboxymethyl-4,5-dihydro-1-(hydroxyethyl)-2-nor(cocoalkyl), hydroxides, monosodium salts	14	164,000
Imidazolium, 1-(carboxymethyl)-2-heptyl-1-(2-hydroxyethyl), hydroxide, sodium salt	12	474,400
Iminodiacetic acid	15	403,000
Imiprenem	06	62,000
Impramine hydrochloride	05	528,000
5-Indanol	13	102,500
1,2,3-Indantrione monohydrate (Nimhydrin)	15	403,000
Indomethacin	15	402,000
Insect attractants, all other	13	120,000
Insulin	06	694,000
Iodinated glycerol	06	586,000
Iodinated (not otherwise halogenated) hydrocarbons, all other	06	
iodobutane	15	1281,000
iodobutylhydroxyquin	15	1277,900
iocetamide (Ethyl iodide), non-medical	06	176,000
iocetane	15	228,000
iodoform	06	262,000
iodomethane (Methyl iodide)	15	288,000
1-iodoperfluorohexane	15	1289,000
3-iodo-2-propyl butylcarbamate	15	245,013
iodhexol	06	566,000
ionone (α - and β -)	07	104,000
α -lonone	07	102,000
β -lonone	07	103,000
Iothalamate, meglumine	06	570,000
Iron acetylacetonate complex	15	1371,750
Iron 1- α -alkylcarboxylate	15	670,000
Iron 2-ethylhexanoate	15	636,000
Iron naphthenate	14	303,000

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
6-Isopropylidocarbene	07	106,210	Lauric acid (Ratio = 1/1)	12	547,000
Isopropyl ether	15	1319,000	Lauric acid (Ratio = 1/1)	12	564,300
5, 5'-Isopropylidenebis(2-hydroxy-m-xylene- α , α' -diol)	03	1037,000	Lauric acid (Ratio = 2/1)	12	534,000
5, 5'-Isopropylidenebis(2-hydroxy-m-xylene- α , α' -diol)	03	1038,000	Lauric acid esters, all other	11	87,000
4, 4'-Isopropylidenediphenol (Bisphenol A)	03	1039,000	Lauric acid, potassium salt	15	88,000
4, 4'-Isopropylidenediphenol, ethoxylated	03	1040,000	Lauric acid, zinc salt	15	678,000
4, 4'-Isopropylidenediphenol, propoxylated	03	1040,500	Lauric and myristic acid (Ratio = 1/1)	12	547,200
Isopropyl iodide	15	1280,500	Lauric and myristic acids	12	535,000
Isopropyl linoleate	15	972,000	Lauric and myristic acids (Ratio = 1/1)	12	564,400
Isopropyl mercaptan (2-Propanethiol)	02	96,030	Lauryl chloride	15	543,000
Isopropyl-1-methoxy-3,7,11-trimethyldodeca-2,4-dienoate	13	231,014	Lauryl peroxide	15	1296,400
Isopropyl myristate	11	88,000	N-Laurylsarcosine, sodium salt	12	44,000
Isopropylnaphthalenesulfonic acid	12	170,000	Lauryl alkyl dimethylamine acetate	14	489,250
Isopropyl oleate, sulfated, sodium salt	12	260,000	Lauryl alkyl dimethylamine phosphate	14	489,260
Isopropyl palmitate	11	98,000	Laurylamidopropyl betaine	12	13,400
o-Isopropylphenol	03	1041,000	Laurylamphoglycinolate	12	13,500
o-Isopropylphenol, mixed	03	1041,100	Lauryl lactate	15	996,000
N-Isopropyl-N-phenyl-p-phenylenediamine	09	63,000	Lauryl methacrylate	15	997,000
Isopulegol	07	106,220	Lauryl methacrylate-stearyl methacrylate copolymer resins	08	19,980
Isostearamidepropyl dimethylamino glycolate	12	475,500	Lauryl pyridinium chloride	12	498,500
Isostearic acid, aminobutyltetraamide, acetate salt	12	575,340	Lead acetate	15	595,000
Isostearic acid, isopropyl titanium salt	12	29,460	Lead t- α -alkylcarboxylate	15	670,500
Isostearic acid, mixed isopropylamines salt	12	29,460	Lead cobalt neodecanoate	15	709,000
Isostearic acid, triethanolamine salt	12	29,500	Lead 2-ethylhexanoate	15	637,000
Isostearic amphipropionate	12	13,000	Lead naphthenate	14	509,000
Isostearyl alcohol, ethoxylated	12	730,200	Lead neodecanoate	15	707,000
Isostearyl isostearate	12	972,300	Lead stearate	15	756,000
Isostearyl neopentanoate	15	985,000	Lead stearate, dibasic	15	957,000
Isotridecyloxypropylamine	12	330,300	Lead subacetate	15	896,000
N-Isotridecyloxypropyl trimethylene diamine	12	330,350	Lead tallowate	15	176,000
Isosvalerone (Disubutyl ketone)	13	824,000	Leuco Sulfur Black 1	04	1107,000
2-Isosvaleryl-1,3-indandione	13	169,900	Leuco Sulfur Black 2	04	1110,000
Traconic acid (Methylenesuccinic acid)	13	539,000	Leuco Sulfur Black 16	04	1115,018
Ivermectin	08	133,001	Leuco Sulfur Blue 7	04	1075,000
Kanamycin	08	50,000	Leuco Sulfur Blue 11	04	1080,000
Ketamine hydrochloride	06	437,000	Leuco Sulfur Blue 13	04	1081,000
Ketamine, tetrafunctional	13	414,000	Leuco Sulfur Brown 1, 1:1	04	1081,000
Ketones, all other	13	839,000	Leuco Sulfur Brown 3	04	1089,000
Lactic acid, edible, 100%	15	541,000	Leuco Sulfur Brown 10	04	1091,000
Lactic acid, technical, 100%	15	542,000	Leuco Sulfur Brown 37	04	1093,000
Lanolin acid	15	104,763	Leuco Sulfur Brown 52	04	1101,000
Lanolin alcohol acetate	15	104,770	Leuco Sulfur Brown 3	04	101,052
Lanolin, ethoxylated	12	671,000	Leuco Sulfur Green 3	04	1085,000
Lanolin, hydroxylated	15	104,773	Leuco Sulfur Green 16	04	1087,000
Lanolin oil	15	104,785	Leuco Sulfur Green 34	04	1087,034
Lanolin wax	15	104,793	Leuco Sulfur Green 35	04	1087,035
Lardine	06	96,500	Leuco Sulfur Green 36	04	1087,036
Lard oil acids	12	533,650	Leuco Sulfur Red 14	04	1070,014
Lard, sulfated, sodium salt	12	293,000	Leuco Sulfur Yellow 22	04	1064,022
Lassaloid, sodium	06	66,600	Leuprolide acetate	06	278,600
Latex type polyvinylidene chloride resins	08	50,010	Levodopa	06	835,000
Lauraldehyde	07	162,000	Lidocaine	06	706,000
3-Lauramido-N,N-dimethylpropylamine oxide	12	387,000	Lidocaine hydrochloride	06	706,000
(3-Lauramidopropyl)trimethylammonium methyl sulfate	12	375,000	Light-oil distillates, all other	01	9,000
Lauric acid	12	570,000	Lignin amine	12	357,010

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Lignin, ethoxylated	12	761,900
Lignin, sodium salt	12	318,400
Ligninsulfates, all other	12	169,000
Ligninsulfonic acid, ammonium salt	12	153,000
Ligninsulfonic acid, calcium salt	12	154,000
Ligninsulfonic acid, chromium salt	12	155,000
Ligninsulfonic acid, iron salt	12	156,000
Ligninsulfonic acid, magnesium salt	12	157,000
Ligninsulfonic acid, mixed chromium and iron salts	12	157,700
Ligninsulfonic acid, potassium salt	12	158,000
Ligninsulfonic acid, sodium salt	12	158,000
Ligninsulfonic acid, zinc salt	12	158,500
l-Limonene	07	50,200
Linyl anthranilate	07	49,500
Linyl benzoate	07	49,600
Lincamycin (animal feed grade)	06	67,000
Lincamycin (medical grade)	06	51,000
Linear alcohols, sulfated, all other	12	240,000
Linear saturated polyester	14	387,000
Linoleic acid (Ratio = 1/1)	12	547,800
Linoleic acid (Ratio = 2/1)	12	536,000
Linoleic acid dimers, alkoxylated	12	711,200
Linopril	14	114,000
Lithium heparin	06	357,300
Lithium hydroxystearate	06	627,000
Lithium hydroxystearate	15	1373,500
Lithium naphthenate	14	307,000
Lithium neodecanoate	15	758,000
Lithium stearate	15	768,000
Lovastatin	06	379,000
Lovapine succinate	06	503,700
Lubricating oil and grease additives, acyclic, all other	14	293,000
Lubricating oil and grease additives, cyclic, all other	14	294,000
2,6-Luridine	03	1047,000
Marenide	06	202,900
Maronide acetate	06	208,000
Magnesium acetate	15	508,000
Magnesium gluconate	06	784,000
Magnesium methylete	15	1362,000
Magnesium salicylate	06	282,500
Magnesium stearate	15	739,000
Maleic acid, monoalkyl ester	12	44,500
Maleic anhydride	12	71,900
Maleic anhydride, polypropylene glycol copolymer	12	111,700
Maleic acid	15	547,900
Malonamide	03	1048,930
Maltase	14	489,000
D-Maltrose	14	489,000
Manganese acetate	15	671,000
Manganese t-O-alkylcarboxylate	15	589,000
Manganese 2-ethylhexanoate	15	639,000
Manganese gluconate	06	765,000
Manganese naphthenate	14	309,000
Manganese neodecanoate	15	709,000
Manganese tallate	15	177,000
Mannitol	15	1087,000
1,2-Maphthoquinone-2-diazide-5-sulfonyl chloride	15	122,300
Maprotiline hydrochloride	06	529,000
Mecizline hydrochloride	06	81,000
Meclofenamate, sodium	06	402,500
Meclofenamic acid	06	837,000
Medicinal chemicals, all other	06	687,000
Medroxyprogesterone acetate	06	680,000
Mefenamic acid	06	682,000
Mefenamic acid	06	603,000
Megestrol acetate	03	680,500
Melamine	06	1050,000
Melamine formaldehyde resin	14	483,000
Melamine formaldehyde resin polymer	14	8,000
Melamine formaldehyde copolymer	14	489,500
Melamine stearyl alcohol polymer	14	490,000
Melengestrol acetate	06	661,000
p-Mentha-1,3-diene (α -Terpinene)	07	107,600
p-Mentha-1,4-diene (γ -Terpinene)	07	107,700
p-Mentha-1,8-diene (Limonene)	07	50,000
dl-p-Mentha-1,8-diene (Limonene)	03	1032,000
p-Mentha-6,8-dien-2-ol (Carveol)	07	106,800
p-Mentha-6,8-dien-2-one (Carvone, Carvol)	07	107,000
1-p-Mentha-6,8-dien-2-yl acetate (Carvyl acetate)	07	107,100
p-Menth-8-en-3-ol (Isopulegol)	07	108,300
p-Menth-1-en-3-one (Piperitone)	07	108,700
p-Menth-4-(8)-en-3-one (Pulegone)	07	108,700
1-1-p-Menthen-6-yl-1-propanone	07	108,600
dl-Menthol, synthetic	07	110,100
l-Menthol, synthetic	07	111,000
l-Menthyl acetate	07	111,100
Menthyl anthranilate	07	50,500
Meperidine hydrochloride	06	494,000
Mercaptoacetic acid (Thioglycolic acid)	15	549,000
Mercaptoacetic acid (Thioglycolic acid) salts, all other	15	698,000
2-Mercaptobenzothiazole	09	30,000
2-Mercaptobenzothiazole, copper salt	09	30,300
2-Mercaptobenzothiazole, sodium salt	13	40,024
2-Mercaptobenzothiazole, zinc salt	13	32,000
2-Mercaptoethanol	15	1353,000
N-(Mercaptoethyl)prthalamide S-(O,O-dimethylphosphorodithiolate)	13	165,024
3-Mercapto-1,2-propanediol (Thioglycerol)	15	1088,000
3-Mercaptopropionic acid	15	550,000
Mercaptopropyltrimethoxysilane	15	1388,000
Mercaptosuccinic acid (Thiomalic acid)	15	551,000
2-Mercaptotolimidazole, zinc salt	09	41,475
Mercox disulfide	15	1353,500
Meta, para-cresol, ethoxylated and polyphosphated, neutralized	12	81,900
Methacrylamide	15	247,000
Methacrylate based cationic polyelectrolytes	15	1450,600

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Methacrylic acid	15	552,000
α -Methacryloxypropyltrimethoxysilane	15	1,389,000
Methadone hydrochloride	06	405,000
Methamphetamine hydrochloride	06	520,000
Methane	02	37,000
Methanearsonic acid disodium salt (DSMA)	13	204,000
Methanearsonic acid, dodecyl- and octyl- ammonium salts	13	205,900
Methanearsonic acid monosodium salt (MSMA)	15	553,000
Methanesulfonic acid	15	554,000
Methanesulfonyl chloride	12	730,725
Methanol, ethoxylated and propoxylated	15	861,000
Methanamine	06	239,000
Methanamine hippurate	06	240,000
Methanamine mandelate	06	241,000
Methimazole	06	645,000
Methionine (animal feed grade)	14	13,000
Methionine, hydroxy analogue, calcium salt	14	15,000
Methoxybenzyl alcohol	06	479,000
Methoxybenzyl alcohol (Anisyl alcohol)	06	279,300
p-Methoxyethanol (Ethylene glycol monomethyl ether)	07	51,950
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	15	1168,000
2-(2-(2-Methoxyethoxy)ethoxy)ethanol (Triethylene glycol monomethyl ether)	15	1170,000
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	15	1171,000
1-Methoxy-2-ethyl acetate	15	1000,800
2-Methoxyethyl acetate	15	1124,000
2-Methoxyethyl acrylate	15	1001,000
Methoxyethyl morpholine	15	108,450
2-Methoxy-naphthalene	07	53,000
N-(2-Methoxy-1-naphthyl)acetamide	03	1060,000
Methoxyphenamine hydrochloride	06	335,000
4-Methoxyphenol	15	109,000
(p-Methoxyphenyl)acetic acid	03	1063,000
1-p-Methoxyphenyl pentan-1-one-3	07	53,400
(α -Methyl-anisalacetone)	07	78,700
3-(2-Methoxyphenyl)-2-propenal	15	1172,000
Methoxypolyethylene glycol	15	1173,000
1-Methoxy-2-propanol	15	54,100
2-Methoxy-4-propenylphenol (Isosugenol)	07	54,100
3-Methoxypropionitrile	15	448,200
Methoxypropyl acetate	15	1178,200
3-Methoxypropylamine	15	417,000
2-Methoxy-propylphenol	15	54,150
Methoxytoluene	15	108,300
Methscopolamine bromide	06	620,700
Methylacrylate	06	421,000
Methyl acetacetate	15	1063,000
4-Methylacetophenone	07	55,000
Methyl acrylate, monomer	15	1004,000
Methylal (Dimethoxymethane)	15	1320,000
Methyl alcohol, alkoxylated	15	730,700
Methylamine, mono-	12	290,000
2-Methylaminoethanol (N-Methylethanolamine)	15	419,000
p-Methylaminophenol sulfate (Metol)	14	362,000
Methyl (tri-hydrogenated tallow alkyl) ammonium chloride	12	498,900
Methyl amyl alcohol	15	862,999
Methyl-t-aryl ether	14	183,000
2-(N-Methylalnilino)ethanol	03	1070,000
3-(N-Methylalnilino)propanitrile	03	1071,000
p-Methylanisole	07	56,000
Methyl anthranilate	07	57,000
2-Methylanthraquinone	03	1075,000
Methylaziridine	15	110,000
β -Methylbenzene propanal	07	57,070
Methylbenzene sulfonate	15	110,150
Methyl-2-benzimidazole carbamate	03	464,300
Methyl benzoate	07	57,100
Methyl-p-benzoquinone	15	110,200
4-Methylbenzotriazole	03	1078,900
α -Methylbenzoyl chloride	03	1078,700
α -Methylbenzyl acetate (Styralyl acetate)	07	58,000
N-Methylbenzylamine	03	1079,000
o-Methylbenzyl chloride	03	1079,050
Methyl benzyl ether	03	1080,000
N-Methylbis(coconut oil alkyl)amine	12	441,000
Methyl, bis-(2-hydroxyethyl) isodecyloxypropylammonium chloride	12	442,000
Methyl, bis-(2-hydroxyethyl) isotridecyloxypropyl ammonium chloride	12	465,135
Methyl, bis-(2-hydroxyethyl) soyaalkylammonium chloride	12	465,140
Methyl bromide (Bromomethane)	13	240,000
2-Methyl-1-butanol	15	841,000
3-Methyl-2-butenyl acetate	07	162,012
3-Methyl butyl butyrate	07	162,453
Methyl-1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	13	24,900
Methyl-t-butyl ether	14	184,000
2-Methylbutyl isovalerate	07	162,015
Methylbutyl pyrophosphate, ethylenedioxy titanium salt	12	100,200
Methyl butynol	07	161,020
Methylcellulose	14	411,000
Methyl chloroformate	15	1008,000
2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanalamine salt	13	118,056
2-(2-Methyl-4-chlorophenoxy)propionic acid, iso-octyl ester	13	118,057
α -Methylcinnamaldehyde	07	59,000
Methyl cinnamate	07	60,000
Methyl cyanacetate	15	448,650
Methylcyclohexane	03	1083,000
α -Methylcyclohexanemethanol	07	111,730

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
2-Methylcyclohexylamine	15	111,100
3-(N-Methyl-N-cyclohexylamino)-6-methyl-7-anilino fluora	15	111,200
1-(2-Methylcyclohexyl)-3-phenylurea (Siduron)	13	76,000
Methylcyclopentadienylmanganese tricarbonyl	14	165,000
2-Methyldecanal	07	162,458
Methyl 3-(2-di-tert-butyl-5-hydroxyhydrochromanone)	15	111,500
Methyl 3-(2-dichloroethyl)-2,2-dimethyl-3-cyano-3-phenoxycyclopropanecarboxylate	13	166,035
Methyl 3-(2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	03	1084,150
Methyl didecylamine	12	442,800
Methyl dihydrogen phosphate	15	1034,000
5-Methyl-1,7-dihydroxy-1,3,4-triazindolizine	15	366,000
Methyl 2-(4,6-dimethoxy-pyrimidin-2-yl) amino carbonyl amino sulfonyl methyl benzoate (Bensulfuron) (Londax)	13	76,045
Methyl N, N'-dimethyl-N-[(methylcarbamoyl)oxy]-1-thioxamidate	13	231,010
Methyl 3-(3-dimethyl-4-pentenoate	15	1009,200
Methyl 2-(4,6-dimethyl-2-pyrimidinyl) amino carbonyl amino sulfonyl benzoate	13	118,065
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	03	1084,700
4-Methyl-2,6-dinitrophenol	03	1084,703
N-Methyloctadecylamine	12	443,000
Methyl dioleoyl ethoxy ammonium methyl sulfate	12	465,250
Methyl-ditaloimidazolium methosulfate	12	465,163
N-Methyldihocarbamic acid, potassium salt	13	187,012
N-Methyldithiocarbamic acid, sodium salt (Metham)	13	241,000
Methylcopa	06	358,000
N-Methylenamine	03	1085,000
2,2-Methylenbis(6-tert-butyl-p-cresol)	09	91,000
2,2-Methylenbis(4-chlorophenol) (dichlorophene)	09	90,000
2,2-Methylenbis(2,6-di-tert-butylphenol)	13	40,025
4,4'-Methylenbis[N,N-diethylamine]	03	1088,100
4,4'-Methylenbis[N,N-dimethylamine] (Methane base)	03	1088,000
Methylene-bis(dimethyl)hydantoin and derivatives	14	166,000
2,2-Methylenbis(4-methyl-6-nonyl-p-cresol)	03	1089,100
Methylenebis(thiocyanate)	13	195,010
Methylene-bridged polyalkyl phenols	14	208,000
Methylene chloride (Dichloromethane)	15	1234,000
4,4'-Methylenediamine	03	1031,000
Methylenedicyclohexylmethane 1,4-dithiocyanate	03	1031,300
1,2-Methylenedioxy-4-propylene benzene (isoSafrole)	07	60,600
Methylene diphenylamine (polymeric)	03	1031,700
5,5'-Methylenedisalicylic acid	03	1032,000
2-Methylene undecanal	07	163,200
Methyl esters of coconut oil	15	974,500
Methyl esters of tallow	15	975,000
Methyl ether D(methyl ether)	15	1321,000
Methyl ethyl ketone	15	826,500
Methyl ethyl sulfide	02	95,600
Chemical name	Sect. Item No.	Sect. Item No.
α -(1-methylethyl-x-4-trifluoro-methoxy)phenyl)-5-pyrimidinmethanol (Flurprimidol)	13	168,997
Methyl formate	15	1010,000
Methyl formol	15	1450,000
Methyl p-formylbenzoate	03	897,500
Methyl furan	15	82,700
Methylglucoside laurate	12	713,000
1-Methyl-2-(β -heptadecyl)-1-(9-octadecyl) amido ethyl	12	476,850
N-(1-methylheptyl)ethanolamine	14	165,500
N-(1-Methylheptyl)-N-phenyl-p-phenylenediamine	09	64,000
5-Methyl-2-hexanone (Methyl isoamyl ketone)	15	827,000
Methyl hexyl ether	07	162,480
Methylhexyl ketone	15	826,800
p-Methylhydrotopaldehyde	07	60,800
Methyl hydrazine, mono	15	444,200
4-methyl-5-hydroxymethyl imidazole	15	448,750
Methyl 12-hydroxydecanoate	15	976,000
(2,4-Methyl-5-imidazole)imethylthioethylamine di hydrochloride	03	1094,853
2,2-(2-Methylimino) diethanol (Methyldiethanolamine)	15	424,000
2-Methylindole	03	1094,900
Methylolone (α - and β -)	07	114,000
γ -Methylolone	07	114,100
6-Methyl- α -ionone	07	112,000
Methyl isobutyl ketone	15	828,000
Methyl isobutyrate	07	162,500
Methyl isodehydroacetate	15	1010,200
1-Methyl-1-isoheptyl-hexahydro benzaldehyde	07	61,100
Methyl iso-octadecenoate	15	977,500
Methyl isothiocyanate and 1,3-dichloropropene	13	243,012
Methyl isovalerate	07	162,520
2-Methylacetonitrile (Acetone cyanohydrin)	15	449,000
Methyl laolate	15	977,600
Methyl mercaptan (Methanethiol)	02	94,000
Methyl methacrylate-butadiene styrene (MBS) resins	08	44,041
Methyl methacrylate, monomer	15	1011,000
N-Methyl-methanamine with borane (1:1)	15	1368,600
Methyl N-methylantranilate	07	82,000
Methyl-2-methyl butyrate	07	162,550
S-Methyl-N-[(methylcarbamoyl)oxy]thioacetimidate (Methomyl)	13	213,400
α -Methyl-3,4-methylene dioxyhydrocinamaldehyde	07	62,200
4-Methyl-N-[(4-methylphenyl)sulfonyl] benzenesulfonamide	03	1096,200
3-Methyl-N-[2(methylsulfonamidoethyl)-N-ethyl-p-phenylenediamine]sequeulfate monohydrate	14	367,500
4-Methylmorpholine	15	117,000
Methylnaphthalene	01	12,500
Methylnaphthalenesulfonic acid, sodium salt	12	173,000
Methyl nicotinate	03	1097,500
N-Methyl-p-nitroaniline	03	1102,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
4-Methyl-2-nitroanisole	03	1104.000
3-Methyl-2-nitrobenzoic acid	03	1106.020
2-Methyl-2-nitro-1-propanol	15	426.000
3-Methyl-2-and3nonene nitrile	07	162.750
Methylnonylnaphthalenesulfonic acid, sodium salt	12	174.000
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	03	1108.000
2-Methyl-1-octyl-1	03	1108.700
Methyl oleate	11	94.000
Methyl oleate, sulfated, sodium salt	12	261.000
N-Methyl-N-oleoyltaurine, sodium salt	12	184.000
N-methyl methyl hexyl ketone	07	162.700
N-Methyl-N-palmitoyltaurine, sodium salt	12	185.000
2-Methyl-2,4-pentanedioI (Hexylene glycol)	15	1089.000
2-Methyl-1-pentanol	15	863.000
4-Methyl-2-pentanol (1-Methylisobutylcarbinol)	15	854.000
4-Methyl-3-penten-2-one (Mesityl oxide)	15	829.000
N-(1-Methylbenzyl)-N-phenyl-p-phenylenediamine	09	64.200
Methyl pentanol	07	182.660
Methylphenolate hydrochloride	06	545.700
Methyl phenylacetate	07	63.000
3-Methyl-5-phenyl-1-pentanol	07	63.200
4-Methyl-1-phenyl-3-pyrazolidone	07	63.000
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4	14	369.000
(1H)-pyridone (Fluridone)	13	118.063
4-Methylpyrithallic acid	03	1120.502
4-Methylpyrithallic anhydride	15	118.700
4-(4'-Methylpiperidino)pyridine	03	1121.400
3-(2-Methylpiperidino)propyl-3,4-dichlorobenzoate (Pipron)	13	40.026
N-Methyl-N-polyoxyethylene-N,N-bis(hydrogenated tallow amidoethyl)ammonium	12	476.920
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	12	476.925
2-Methylprednisolone	06	663.000
2-Methyl-2-propanamine with borane(1:1)	15	1368.700
Methyl propionate	07	162.665
Methylpseudoionone	15	830.000
1-Methyl-2-pyrrolidone monomer	15	120.000
Methyl ricinoleate	11	110.000
Methyl stearate	07	64.000
15	978.000	
α-Methylstyrene	03	1125.000
ar-Methylstyrene (Vinyltoluene)	03	1125.100
α-Methyl styrene polymers	08	45.000
Methyl sulfide (Dimethyl sulfide)	15	1013.000
Methyl sulfide (Dimethyl sulfide)	15	1354.000
Methyl sulfoxide (Dimethyl sulfoxide)	15	1355.000
N-Methyl-N-(tall oil acyl)taurine, sodium salt	12	186.000
Methyl-1-tallowamidoethyl-2-tallowimidazolium-methyl sulfate	12	498.700
Methylaloldiethylenetriamine condensate, polyethoxylated, methyl sulfate	12	465.200
Methylaloldiethylenetriamine condensate, polypropoxylated, methyl sulfate	12	465.210
Methyltestosterone	06	641.200
Methyl tetrahydrofuran (Methyl THF)	15	82.800
Methyltetrahydrophthalic anhydride	15	120.300
Methylthiosulfonic acid, S-(2-hydroxypropyl) ester	13	205.925
Methyl tri(C9-10)ammonium chloride	12	499.900
1-Methyl-3,5,7-triaza-1-azonia tricyclodecane chloride	13	175.300
5-Methyl-1,2,4-triazolo[3,4-b]benzothiazole (Tricyclazole)	13	40.027
Methyltrimethoxysilane and polymethyltrisiloxane	15	1390.000
Methyltriethylammonium chloride	12	499.000
2-Methylundecanal	07	163.000
Methyl vinyl ether	15	1322.000
Methyrolon	06	474.000
Methopropamide hydrochloride	06	81.300
Metoprolol tartrate	06	358.300
Metronidazole	06	177.000
Methylpropone	06	578.000
Mexane-1,6-bis(tributyl ammonium bromide)	12	497.500
Mexylsolanilamidocarboxylic acid, monoethanolamine salt	12	26.150
Minoxiline	06	35.000
Minoxidil	06	358.400
Miscellaneous acyclic chemicals, all other	06	1423.000
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	12	14.000
Mixed alcohol borates	15	1368.720
Mixed alcohols, ethoxylated	12	782.000
Mixed alkane sulfonic acid	12	212.000
Mixed alkane sulfonic acid, sodium salt	12	212.000
3-(Mixed alkoxy)propylamine, ethoxylated oxides	12	330.950
3-(3-Mixed alkoxy)propylaminopropyl amine	12	330.955
(Mixed alkyl) amine	12	331.000
(Mixed alkyl) amine, ethoxylated	12	331.000
(Mixed alkyl) amine phosphate	12	394.700
(Mixed alkyl) ammonium chloride	12	499.300
Mixed alkyl benzoate	12	714.450
Mixed t-α-alkylcarboxylic acid salts	15	671.100
(Mixed alkyl) dibenzyltrimethyl-1,3-propane diammonium chloride	12	527.580
Mixed alkyl imidazoline derivative, ethoxylated	12	465.300
(Mixed alkyl) phenol, alkoxylated	12	745.900
(Mixed alkyl) phenol alkylenediaminealkanolamine formaldehyde	12	782.950
(Mixed alkyl) phenol epichlorohydrin-formaldehyde, alkoxylated	12	722.100
(Mixed alkyl) phenol, ethoxylated	12	746.000
(Mixed alkyl) phenol, ethoxylated, butyl ether	12	747.000
(Mixed alkyl) phenol, ethoxylated and sulfated, sodium salt	12	286.000
(Mixed alkyl) phenol-formaldehyde, alkoxylated	12	722.000
(Mixed alkyl) phenol formaldehyde, methoxylated	12	722.015
Mixed alkyl phenol sulfate, ethoxylated, triethanolamine salt	12	244.300
Mixed alkyl phosphate, sodium salt	12	102.100
Mixed alkyl phosphate	12	101.000
Mixed alkyl phosphate, alkylamine salt	12	101.500
Mixed alkyl phosphate, diethanolamine salt	12	102.000
Mixed alkyl phosphate, potassium salt	12	102.050
Mixed alkyl phosphate, triethanolamine salt	12	102.120

Table D-1.—Continued
Alphabetical Chemical Index

Chemical name	Sect. item No.	Chemical name	Sect. item No.
N-(Mixed alkyl)polyethylenepolyamine	12	Mixed (secondary linear alcohol)polyethylene propionic acid, sodium salt	12
Mixed alkyl stearate	412, 000	Mixed tall oil and rosin acids, ethoxylated	12
(Mixed alkyl) sulfoacetate	714, 520	Mixed vegetable fatty acids, potassium salt	12
Mixed alpha-olefins and vegetable	15, 000	Mixed vegetable fatty acids, sodium salt	12
Mixed animal and vegetable oil, sulfated, sodium salt	318, 485	Mixed vegetable oils, sulfated, sodium salt	12
Mixed aryl dimides	299, 800	Mixed vegetable oils, sulfated, sodium salt	12
Mixed carboxylic acids	167, 000	Mixed wool grease and tall oil fatty acids	12
Mixed carboxylic acids	536, 450	Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl) ammonium chloride	12
Mixed (coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	547, 850	Mixtures of specifically itemized, all other	12
Mixed dialkyl hydrogen phosphates	477, 220	Mixtures of alcohols, C ₁₂ and higher, other	15
Mixed di and triethylene glycol mono ester of tall oil acid	1034, 500	Modified ethylene-propylene copolymers	15
Mixed ester of resin and rosin acids	714, 600	Modified rosin (Unesterified)	08
Mixed fatty acid amide with diethylene triamine ethyl sulfate	680, 450	Modified rosin esters	08
Mixed fatty acid amide with diethylene triamine ester	477, 226	Monesin	06
Mixed fatty acids-alkylenediamine condensate, polyethoxylate	783, 500	Mono-, di-, and triesters of phenyl(2,3,4-trihydroxyphenyl) methane with 6-diazo-5,6-dihydro-5-oxo-1-naphthalene sulfonic acid	03
Mixed fatty acids, alkyl ether, ethoxylated	377, 000	Monoethanolamine	15
Mixed fatty acids camine acid ratio = 1/1	671, 100	Monoisopropanolamine	15
Mixed fatty acids, diethanolamine condensate	547, 855	Monomethylacetacetamide	15
Mixed fatty acids, neutralized	578, 800	Monomethyl tin	15
Mixed fatty acids-polyalkylenepolyamine condensate	536, 570	Mordant Brown 1	04
Mixed fatty acids-polyalkylenepolyamine condensate	361, 000	Mordant Brown 16	04
Mixed fish oils, sulfated, ammonium salt	299, 990	Mordant Brown 33	04
Mixed fish oils, sulfated, ammonium salt	300, 000	Mordant Brown 70	04
Mixed higher glycol amine (MHGA)	430, 500	Mordant Orange 1	04
Mixed linear alcohols, alkoxylated, all other	741, 000	Mordant Orange 6	04
Mixed linear alcohols, alkoxylated	741, 000	Mordant Red 7	04
Mixed linear alcohols, alkoxylated and phosphated, potassium salt	736, 950	Mordant Yellow 1	04
Mixed linear alcohols, ethoxylated	87, 007	Morphine sulfate	06
Mixed linear alcohols, ethoxylated and phosphated, benzyl ether	318, 500	Morpholine	15
Mixed linear alcohols, ethoxylated and carbonated, sodium salt	87, 000	Morpholine residue stream	15
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	737, 000	Morpholine salt of p-toluene sulfonic acid	15
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	737, 100	N-Morpholinyl-2-perthiazolyl disulfide	09
Mixed linear alcohols, ethoxylated and propoxylated	318, 500	p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	14
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	87, 010	Mustard seed oil, sulfated, sodium salt	15
Mixed linear alcohols, ethoxylated and sulfated, diethanolamine salt	738, 000	Myrcene	07
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	276, 000	Myristaldehyde	07
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	276, 500	Myristic acid (Ratio=1/1)	11
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	278, 000	Myristic acid esters, all other	12
Mixed linear alcohols, sulfated, ammonium salt	232, 000	Myristyl alcohol, propoxylated	03
Mixed linear alcohols sulfated, mixed sodium cocodithanolamine salts	232, 520	Myristylbenzylidimethylammonium chloride.2H ₂ O	15
Mixed linear alcohols, sulfated, sodium salt	233, 000	Myristyl bromide	11
Mixed linear alcohols, sulfated, triethanolamine salt	233, 100	Myristyl ethoxy myristate	15
(Mixed linear alkyl) dimethyl ammonium methyl sulfate	500, 100	Myristyl lactate	15
Mixed linear olefin sulfonate	212, 125	Myristyl myristate	15
Mixed oleic, lauric, stearic, and palmitic hexaglycerol esters	212, 125	Myristyl stearate	11
Mixed polyesters	692, 000	Nadolol	06
	284, 000	Nafollin, sodium	06

Table D-1—Continued
Alphabetical chemical Index

<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Sect. Item No.</i>
Naphazoline hydrochloride	06	52,000
1-Naphthaldehyde	03	336,000
Naphthalene	02	133,800
Naphthalene, crude, solidifying at less than 74° C	01	17,000
Naphthalene, crude, solidifying at 76° C to less than 76° C	01	12,000
Naphthalenesulfonates, all other	12	14,000
2-Naphthalenesulfonic acid	03	176,000
1-Naphthalenesulfonic acid, formaldehyde condensate and salt	03	1141,000
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	14	465,000
1-Naphthalenesulfonic acid, 8-(phenylamino)-monosodium salt	14	465,000
Naphthalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone	03	1308,500
Naphthalene sulfonic acid, polymer with formaldehyde, sodium salt	12	722,445
2-Naphthalenesulfonic acid, sodium salt	12	722,500
Naphthalene sulfonic acid, sodium salt, formaldehyde condensate	03	1143,000
Naphthalimide	12	174,500
Naphthalene driers, mixed salts	03	1148,000
Naphthentic acid, acid number 150-199	14	310,000
Naphthentic acid, acid number 200-224	02	19,000
Naphthentic acid, acid number 225-249	02	20,000
Naphthentic acid, acid number less than 150	02	21,000
Naphthentic acid, copper salt	02	18,000
Naphthentic acid, ethoxylated	13	26,000
Naphthentic acids-polyalkylene polyamine condensate	12	45,800
Naphthentic acids-tall oil fatty acids-polyalkylene polyamine condensate	12	361,150
1-Naphthol, ethoxylated and sulfated, free acid	12	361,200
Naphthol reds, all other	12	286,090
1-Naphthylamine (α -Naphthylamine)	05	46,000
p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2-naphthylamine)	03	1158,000
N-1-Naphthylphthalamic acid (NPA)	03	1160,000
Naphthalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone, ammonium salt	12	77,900
Natural fats and oils, ethoxylated, all other (NBR) type	10	12,000
Neat's foot oil, sulfated, sodium salt	12	722,450
Neo-C ₈ -C ₁₂ acids	10	294,000
Neocalkoxy, dodecylbenzene-sulfonyl titanate	15	555,970
Neocalkoxy, tris(m-amino)-phenyl titanate	12	137,500
Neocalkoxy, trineodecanoyl titanate	12	331,850
Neocalkoxy, trineodecanoyl zirconate	12	331,850
Neocalkoxy, tris(m-amino) phenyl zirconate	12	331,850
Neocalkoxy, tris(dioctyl) pyrophosphato zirconate	12	102,550
Neocalkoxy, tris (ethylene diamino) zirconate	12	331,870
Neodecanol acid	15	556,000
Neodecanol chloride	15	557,000
Neopentanol chloride	15	557,100
Neopentane (2,2-Dimethylbutane)	02	67,000
Neomycin (medicinal grade)	06	52,000
Neomycin (animal feed grade)	06	69,000
Neopentyl glycol adipate	11	64,500
Neopentyl glycol dibelate	11	94,250
Neopentyl glycol glutarate	11	85,650
Neopentyl chloride	15	1239,810
Neostigmine methylsulfate	06	317,000
Nextrimin	06	62,001
Niacin (medicinal grade)	06	779,000
Niacinamide (medicinal grade)	06	780,500
Niacinamide hydrochloride	06	781,000
Nickel acetate	15	601,000
Nickel 2-ethylhexanoate	15	840,000
Nicotine poliacrifex	06	836,000
Nicotinonitrile (3-Cyanopyridine)	03	1162,000
Nicotinyl alcohol tartrate	06	373,000
Nifedipine	06	374,200
Nitarsone	06	158,000
Nitrated lard oil	15	431,000
Nitriles, all other	15	457,000
Nitroacetic acid, zinc salt	14	85,000
Nitriolacetic acid	14	78,000
Nitriolacetic acid, trisodium salt	14	81,000
Nitrolo-tris-methylene triphosphonic acid	14	82,000
Nitrolo-tris-methylene triphosphonic acid, potassium salt	14	83,000
Nitrolo-tris-methylene triphosphonic acid, sodium salt	14	84,000
o-Nitroaniline	03	1172,000
p-Nitroaniline	03	1173,000
5-Nitroanthranilic acid	03	1184,000
1-Nitroanthraquinone	03	1185,000
p-Nitrobenzamide	03	1187,503
m-Nitrobenzamide	03	1190,000
m-Nitrobenzenesulfonic acid, sodium salt	03	1195,000
5-Nitrobenzimidazole nitrate	14	372,000
o-Nitrobenzoic acid	03	1200,503
m-Nitrobenzoic acid	03	1200,503
p-Nitrobenzoic acid, sodium salt	03	1201,000
m-Nitrobenzoic acid, sodium salt	03	1205,603
2-Nitro-N-benzoylaniline	03	1210,000
5-Nitrodimethylisophthalate	03	1215,150
Nitrodiphenylamine	03	1212,000
Nitroethane	15	459,000
Nitrogenous compounds, acyclic, all other	15	484,000
5-Nitrosophthalic acid	03	1215,000
Nitromethane	15	460,000
3-Nitro-4-methylacetophenone	03	1215,350
Nitroamide	06	182,000
1-Nitronaphthalene	03	1216,000
p-Nitrophenethyl alcohol	03	1224,000
o-Nitrophenol	03	1227,000
p-Nitrophenol	03	1228,000
p-Nitrophenol, sodium salt	03	1229,000
2-Nitro-N-phenyl-p-phenylenediamine	03	1232,500
1-Nitropropane	15	461,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
2-Nitropropane	15	462,000	Nystatin (medicinal grade)	06	3,000
3-Nitro-6-pyrrolidyl toluene	03	1237,500	Ocimene	07	165,700
5-Nitrosalicylaldehyde	03	1238,000	Ocimenyl acetate	07	165,800
p-Nitrosophenol	03	1240,000	Octabromodiphenyl oxide	15	122,500
4-Nitrosophenol, sodium salt	03	1240,100	Octachlorohexahydro-4,7-methanindene (Chlordan)	13	143,000
N-Nitrosophenyldiethylamine salt	15	122,450	n-Octadecane	15	1346,000
o-Nitrotoluene	03	1244,000	Octadecanoic acid, 2-(1-carboxyethoxy)-1-methyl-2-oxoethyl ester, sodium salt	15	1355,150
m-Nitrotoluene	03	1243,000	1-Octadecanol (Stearyl alcohol)	15	877,000
p-Nitrotoluene	03	1245,000	cis-9-Octadecene-1-ol (Oleyl alcohol)	15	878,000
Nitrotoluene mixtures	03	1246,000	9-Octadecenyl acetate, sulfated, sodium salt	12	267,800
(2-Nitro-4-trifluoromethylphenyl)acetic acid	06	620,800	9-Octadecenyl alcohol, ethoxylated	12	791,000
Nizatidine	07	165,000	9-Octadecenyl alcohol, ethoxylated and phosphated	12	84,000
Nonanal	06	1344,000	9-Octadecenylamine	12	424,000
n-Nonane	15	1344,000	(9-Octadecenyl)amine, ethoxylated	12	332,000
1,3-Nonanediol acetate	07	165,200	Octadecenyl succinic anhydride	15	165,800
Nonanoic acid (Palarionic acid)	15	559,000	N-(9-Octadecenyl)trimethylenediamine	12	413,000
Nonanol	07	165,300	Octadecyl alcohol, ethoxylated	12	732,000
Nonanoyl chloride	15	559,050	Octadecylamine	12	425,000
Nonene (Tripropylene)	02	80,000	Octadecylamine acetate	12	396,000
Nonenylsuccinic anhydride	15	165,770	Octadecylamine, ethoxylated	12	393,000
Nonionic surface-active agents, all other	12	787,000	Octadecylamine, ethoxylated	12	425,000
Non-phen type, polyamide resins	08	27,000	Octadecylamine, ethoxylated	12	396,000
Nonyldiphenylamine mixture (Mono-, di-, and tri-tert-Nonyl mercaptan)	09	171,250	Octadecyl-N,N-di(2-hydroxyethyl)-N-methylammonium chloride	15	124,000
Nonylphenol	03	1262,000	Octadecyl-3-mercaptopropionate	12	465,400
Nonylphenol, alkoxylated/aminated	15	122,462	N-Octadecylsulfosuccinamic acid, disodium salt	15	1016,000
Nonylphenol, barium salt	14	229,000	Octahydro-5-methoxy-4,7-methano-1H-indene, 2-carboxaldehyde	12	179,000
Nonylphenol, ethoxylated	12	749,000	Octanal	07	64,600
Nonylphenol, ethoxylated and carbonated, sodium salt	12	318,640	n-Octane	07	166,000
Nonylphenol, ethoxylated and phosphated	12	82,000	n-Octane	15	1348,000
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	12	83,100	n-Octane	02	75,000
Nonylphenol, ethoxylated and phosphated, sodium salt	12	83,200	n-Octanesulfonic acid, sodium salt	12	212,100
Nonylphenol, ethoxylated, phosphate esters	12	750,010	1-Octanol	15	866,000
Nonylphenol, ethoxylated and propoxylated	12	750,000	2-Octanol (Hexyl methyl ketone)	15	831,000
Nonylphenol, ethoxylated and sulfated, ammonium salt	12	287,000	3-Octanone (Ethyl amyl ketone)	07	166,200
Nonylphenol, ethoxylated and sulfated, sodium salt	12	288,000	Octanoyl chloride	15	561,000
Nonylphenol, ethoxylated, with fumaric acid	12	750,045	2-Octanoylhydroquinone	03	1264,300
Nonylphenol, ethoxylated, with mixed fatty acids	12	750,050	Ocenes, mixed	02	75,700
Nonylphenol ethoxylate, oleate	12	714,650	Ocenylic acid	15	165,820
Nonylphenol-formaldehyde, alkoxylated	12	723,000	Ocenylic acid anhydride	07	166,300
Nonylphenol glycidyl ether	15	122,470	tert-Octylamine	15	293,100
Nonylphenol oleate, ethoxylated	12	45,900	Octyl chloride	15	1241,000
Nonylphenol poly(ethyleneoxy)acetic acid, sodium salt	12	85,000	n-Octyl n-decyl adipate	11	65,000
Nonylphenol phosphites, mixed	09	1126,400	Octyl decyl dimethyl ammonium chloride	12	500,700
Nopopentyl glycol dicaprate	15	114,950	n-Octyl, N-decyl, N,N-dimethyl ammonium chloride	12	483,200
Nopal	07	115,000	n-Octyl n-decyl pthalate	11	49,000
Nopol acetate	07	115,000	2-Octyldecyl-12-stearoyl stearate	11	124,540
2-Nor-tall oil alkyl-1-tall oil amido-ethyl imidazoline	12	361,050	Octyldimethylamine oxide	12	333,050
Nortriptyline hydrochloride	06	534,500	Octyldiphenylamine	09	77,000
Noscapine	06	431,000	Octyldiphenylamine, alkylated	09	78,000
Novobocin (animal feed grade)	06	70,000	Octyl diposphate, oxoethylene titanium salt	12	104,600
Novobocin, sodium	06	53,000	Octyl epoxystearates	11	78,000
Nylon 6 (Polymer for fiber, only)	14	388,000	Octyl formate	07	166,355
Nylon 6/6	14	389,000	N-n-Octyl glucamine	15	464,500
Nylon type, polyamide resins	08	26,000	Octyl isobutyrate	07	166,358

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Item No.	Chemical name	Sect. Item No.	Item No.
2-n-Octyl-4-isothiazolin-3-one	13	25,500	N-(10-oxylisopropyl)sulfosuccinamic acid	12	180,000
Octyl isovalerate	07	166,360	Oleoylpalmitamide	15	251,000
n-Octyl mercaptan	09	171,400	Oleyl acid phosphate	14	209,000
Octyl mercaptans	02	95,010	Oleyl alcohol, ethoxylated	12	732,100
Octylmethoxy chlamate	15	124,800	Oleyl betaine	12	16,100
Octylphenol	03	1265,000	Oleyl oleate	11	94,500
n-Octylphenol, ethoxylated	12	752,000	Oleyl sulfate, sodium salt	12	238,200
Octylphenol, ethoxylated and phosphated	12	85,000	Olive oil acids, sodium salt	12	62,000
Octylphenol, ethoxylated and phosphated, magnesium salt	12	86,000	Organo-aluminum compounds, all other	15	1367,000
tert-Octylphenol-formaldehyde, ethoxylated	12	724,000	Organo-boron compounds, all other	15	1371,000
Octylphenoxydiethoxy chloride	03	1265,118	Organo-magnesium compounds, all other	15	1378,000
Octylphenoxy polyethoxy ethyl sulfate	12	296,100	Organo-silicone compounds, all other	15	1399,000
Octyl phosphate, alkylamine salt	12	100,000	Organotin compounds, all other	15	1407,000
Octyl phosphate, isopropoxy titanium salt	12	106,700	Organotin mercaptides	15	1404,890
Octyl phosphate neosalkoxy titanium salt	12	106,700	Ormetoprim	06	265,500
Octyl polyphosphate	12	108,000	Orphenadrine citrate	06	479,500
Octyl polyphosphate, potassium salt	12	109,000	Other copolymer resins of acrylic and/or methacrylic acid esters	08	20,000
Octyl pyrophosphate, ethylenedioxy titanium salt	12	110,100	Other ethylene copolymer resins	08	31,800
Octyl pyrophosphate, ethylenedioxy titanium salt/dimethylamino methacrylate salt	12	110,110	Other homopolymer resins of acrylic and/or methacrylic acid esters	08	20,050
Octyl pyrophosphate, isopropoxy titanium salt	12	110,150	Other hydrolytic enzymes	14	120,000
Octyl pyrophosphate neosalkoxy titanium salt	12	110,160	7-Oxabicyclo-[2.2.1]-heptane-2,3-dicarboxylic acid, disodium salt (Endothall)	13	83,000
Octyl sulfate, sodium salt	12	238,000	Oxacinil, sodium	06	18,000
N-Octyltriethoxy silane	15	1390,500	Oxalyl bis(benzylidene hydrazide)	15	125,490
Oil-soluble petroleum sulfonate, all other	14	217,000	Oxamide	15	251,250
Oil-soluble petroleum sulfonate, ammonium salt	14	211,000	Oxidate light ends	15	1451,000
Oil-soluble petroleum sulfonate, barium salt	14	212,000	Oxidized Fischer-Tropsch wax	15	566,000
Oil-soluble petroleum sulfonate, calcium salt	14	213,000	Oxidized hydrocarbon mixture	14	218,000
Oil-soluble petroleum sulfonate, magnesium salt	14	214,000	Oxalochol bottoms, sulfated, sodium salt	12	238,500
Oil-soluble petroleum sulfonate, sodium salt	14	215,000	Oxaluminum isopropoxide	15	1363,050
Oleamide (Octadecene amide)	15	250,000	Oxaluminum stearate	15	1363,100
Oleamidopropyl betaine	12	15,900	3-Oxo-1,2-benzisothiazoline-2-acetic acid, methyl ester, 1,1-dioxide	03	1272,000
Oleamidopropyl dimethyl amine	12	387,500	5-Oxo-1-phenyl-2-pyrzoline-3-carboxylic acid, ethyl ester	03	1273,000
Oleamidofulfosuccinamic acid, disodium salt	12	179,900	Oxo process bottoms	15	1451,300
Oleic acid (Ratio = 1/1)	12	548,000	Oxtriphylline	06	745,800
Oleic acid (Ratio = 2/1)	12	538,000	Oxyluminum benzoate	03	1275,700
Oleic acid	15	563,000	Oxyluminum octanoate	15	1363,200
Oleic acid, ammonium salt	12	59,800	p,p'-Oxybis(benzenesulfonhydrazide)	09	109,000
Oleic acid, diethanolamine salt	12	29,990	Oxybutynin chloride	06	301,500
Oleic acid-diethylenetriamine condensate	12	363,000	Oxycodone hydrochloride	06	406,000
Oleic acid-N,N-dimethyltrimethylenediamine condensate	12	365,000	Oxycodone terephthalate	06	406,100
Oleic acid, epoxidized, ammonium salt	12	59,900	4,4'-Oxydianiline	03	1275,500
Oleic acid esters, all other	11	96,000	N-Oxydiethylene-2-benzothiazolesulfenamide	09	34,000
Oleic acid-ethanolamine condensate, ethoxylated	12	579,000	Oxydiethylenesulfenamide	09	34,100
Oleic acid, ethoxylated and propoxylated	12	671,505	Oxygen-containing quaternary ammonium salts (except those having amide linkages), all other	12	467,000
Oleic acid-ethylenediamine condensate, propoxylated and sulfated, sodium salt	12	16,000	Oxyphenacylamine hydrochloride	06	302,000
Oleic acid, mixed isopropanolamine salt	12	30,400	Oxytetraacycline (medicinal grade)	06	36,000
Oleic acid, potassium salt	12	60,000	Oxytetraacycline (animal feed grade)	06	72,000
Oleic acid, sodium salt	12	61,000	Palmitic acid esters, all other	11	101,000
Oleic acid, sulfated	12	261,600	Palmitic and stearic acids (Ratio = 2/1)	12	540,000
Oleic acid, sulfated, disodium salt	12	261,700			
Oleic acid, sulfated, sodium salt	12	261,800			
Oleic acid, triethanolamine salt	12	31,000			

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Palmitic and stearic acids, sodium salt	63.350	Pentobarbital	06
Palmitoyl chloride	549.000	Pentylamine, mono	06
Palm kernel oil acids (Ratio=1/1)	57.100	o-Pentylchlorinaldehyde	15
Palm kernel oil acids, potassium salt	62.890	o-Pentylphenol (o-Amylphenol)	07
Palm kernel oil acids, sodium salt	62.900	p-tert-Pentylphenol	03
Palm oil acids—ethylenediamine condensate, monoethoxylated	379.000	Pepsin	14
Palm oil acids, sodium salt	63.000	Perchloroethylene (Tetrachloroethane)	15
Panthanol	790.000	Perchloromethanethiol (Perchloromethyl mercaptan)	15
Papain	102.000	Perfluoroalkyl polyether	15
para-Cymene	95.400	Permethrin acid chloride	03
Parafrin oils, chlorinated	1241.500	Peroxyacetic acid (Peracetic acid)	15
n-Paraffins, other	85.000	Perphenazine	06
n-Paraffins, C ₁₀ -C ₁₄	84.000	3,4,9,10-Perylenetetracarboxylic acid	03
n-Paraffins, C ₁₀ -C ₁₈	84.250	3,4,9,10-Perylenetetracarboxylic-3,4,9,10-dilanthide	03
n-Paraffins, C ₁₂ -C ₁₈	84.280	3,4,9,10-Perylenetetracarboxylic-3,4,9,10-dilimide	03
n-Paraffins, C ₈ -C ₉	81.000	Pesticides and related products, acyclic, all other	13
n-Paraffins, C ₈ -C ₁₅	83.000	Pesticides and related products, cyclic, all other	13
Paratormaldehyde	1176.500	Petroleum hydrocarbon resins	13
Parahydroxyphenylglycine potassium methyl dane salt	1121.650	Petroleum sulfonic acid, calcium salt	08
Paranut oil, sulfated, sodium salt	310.000	Petroleum sulfonic acid, water soluble (Acid layer), sodium salt	12
Pecan oil, sulfated, sodium salt	309.900	1,10-Phenanthroline	12
Pectinase	116.000	Phendimetrazine	03
Peargonic acid (Ratio = 2/1)	541.000	Phenethyl acetate	06
Peargonic acid, calcium salt (Calcium nonoate)	730.200	Phenethyl alcohol	07
Peargonic acid esters, all other	101.500	2-Phenethylamine	03
Peargonic acid—tetraethylenepentamine condensate	366.000	Phenethyl bromide	03
Pemoline	547.500	Phenethyl formate	07
Penicillin G, benzathine	21.000	Phenethyl isobutylate	07
Penicillin G, potassium	22.000	Phenethyl isovalerate	07
Penicillin V, potassium	29.000	2-Phenethyl-2-phenylacetate	07
Penicillin G, procaine (animal feed grade)	74.000	1-Phenethyl-2-picolium bromide	12
Penicillin G, procaine (medicinal grade)	23.000	Phenethyl propionate	07
Pentabromochlorocyclohexane	1275.300	Phenethyl salicylate	07
Pentachlorophenol, sodium salt	29.000	p-Phenetidine	03
Pentaerythritol	1091.000	Phenidine tartrate	06
Pentaerythritol distearate	715.000	Phenobarbital, sodium	08
Pentaerythritol esters	1286.000	Phenol, alkylated	09
Pentaerythritol stearate	715.100	Phenol, benzylated	09
Pentaerythritol stearate	715.100	Phenol, ethoxylated	12
Pentaerythritol tetraacrylate	1130.000	Phenol, ethoxylated and phosphated	12
Pentaerythritol tetakis (3-Mercaptopropionate)	1131.000	Phenol, ethoxylated and phosphated, diethanolamine salt	12
Pentaerythritol tetraoleate	1131.300	Phenol-formaldehyde resin (with lignite)	12
Pentaethylenhexamine	294.000	Phenol glycidyl ether	15
N,N',N'',N'''-Pentamethyl-N-(tallow alkyl) trimethylene [bisammonium chloride]	501.000	Phenol, hindered	09
Pentamide isethionate	270.700	Phenolic antioxidants, all other	09
n-Pentane	592.000	Phenolic and other tar acid resins	08
1,5-Pentanediol	1092.000	Phenol, natural, from petroleum, all other	03
2,4-Pentanedione (Acetylacetone)	833.000	Phenol, natural, from petroleum, U.S.P.	03
1-Pentanol	843.000	Phenol salts, all other	14
3-Pentanone (Diethyl ketone)	835.000	Phenols, ethoxylated, all other	12
Pentazocine	416.001	Phenol, styrenated	03
Pentazocine hydrochloride	416.003	Phenol, styrenated, mixtures	09
2-Pentene	57.000	Phenolsulfonaphthalein, sodium salt	03
Pentenes, mixed	58.000		

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Phenol-sulfonated formaldehyde rosin	15	α-D-Phenylglycine methyl ester K	15
Phenolsulfonic acid	125,960	Phenylglycine, sodium salt	1323,000
1-Phenol-2-sulfonic acid, formaldehyde condensate	03	1-Phenyl-2-hydroxy-2-methyl-propanone-1	15
(Phenol-formaldehyde, sulfonated)	14	2,2-(Phenyl)limino diethanol (N-Phenyldehtanolamine)	03
Phenolsulfonic acid, sodium salt	1289,802	2,2-(Phenyl)limino diethanol, diacetate ester	03
Phenol, sulfonated	04	Phenyl-5-mercaptotetrazole	14
Phenol, synthetic, all other	03	Phenylmercuric acetate (PMA)	13
Phenol, synthetic, from chlorobenzene by vapor-phase hydrolysis, U.S.P.	03	Phenylmercuric ammonium acetate	13
Phenol, synthetic, from cumene by oxidation, U.S.P.	03	Phenylmercuric carboxylate	03
Phenol, synthetic, from toluene by oxidation, U.S.P.	03	Phenylmercuric oleate	13
Phenoxyacetic acid, sodium salt	1289,600	N-Phenyl-1-naphthylamine	15
3-Phenoxybenzaldehyde	03	o-Phenylphenol	03
3-Phenoxybenzaldehyde cyanohydrin	03	p-Phenylphenol	03
3-Phenoxybenzenemethanol	1289,617	o-Phenylphenol, sodium salt	03
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	03	N-Phenyl-p-phenylenediamine	03
2-Phenoxyethyl isobutylate	15	1-Phenyl-1,2-propanedione, 2-oxime	03
Phenoxyethyl propionate	07	3-Phenyl-1-propanol (Hydrochinamic alcohol)	07
3-(Phenoxyphenyl) methyl-cis, trans-3-cyclopropanecarboxylate	13	Phenylpropanolamine	15
(2,2-dichloroethyl)-2,2-dimethyl and adhesives)	08	Phenylpropanolamine bitartrate	06
Phenoxy (R) resin (other than for coating	166,025	Phenylpropanolamine hydrochloride	06
m-Phenoxytoluene	03	3-Phenylpropyl acetate	07
Phenoxymide	06	3-Phenylpropyl cinamate	07
Phentermine	06	4-Phenylpropylpyridine	03
Phenylacetalddehyde	06	1-Phenyl-3-pyrazolidone	14
Phenylacetalddehyde, dimethyl acetal	07	Phenylstyrene, ethoxylated	12
Phenylacetic acid	76,050	5-Phenyltetrazole	09
Phenylacetic acid isopentyl ester	07	Phenyltoloxamine citrate	06
Phenyl acid phosphate	03	Phenyltriethoxysilane	05
Phenyl acid phosphate	129,300	1-Phenylsal-1,2-propanidione	15
Phenyl alanine	14	Phenyltol	07
α-Phenylanisole	07	Phenyltol, sodium	06
4-(Phenylazo)diphenylamine	03	Phosgene (Carbonyl chloride)	06
2-Phenylbenzimidazole	03	2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	15
Phenylbutazone	06	N-(Phosphonomethyl)glycine, isopropylamine salt	14
4-Phenyl-3-buten-2-one	15	N-(Phosphonomethyl)glycine, sodium sesqui salt	13
Phenyldisodocyl phosphate	07	Phosphoric acid esters, all other	11
m-Phenylenebismaleimide	09	Phosphoric and polyphosphoric acid esters, all other	12
m-Phenylenebismaleimide	03	Phosphorothioates used as lubricating oil and grease additives, all other	14
o-Phenylenediamine	03	Phosphorus acid esters, all other	15
p-Phenylenediamine	03	Photographic chemicals, all other	14
Phenylenediamine, substituted, other	09	Phthalic acid	03
Phenylephrine bitartrate	06	Phthalic acid, diallyl ester	11
Phenylephrine hydrochloride	06	Phthalic acid, lead salt, (Dibasic)	15
Phenylephrine tartrate	06	Phthalic anhydride esters, all other	11
Phenyl ether (Diphenyl oxide)	03	Phthalic anhydride type alkyl resins	08
d(+)-α-Phenylethylamine	03	Phthalimide	03
Phenylethyl benzozate	07	[Phthalocyaninato(2-)] copper	03
Phenyl glycolyl ether	15	[Phthalocyaninetetramethaniminato] copper	03
N-Phenylglycine	03	Phthalocyaninetetra-sulfonyl chloride, copper derivative	03
		Phthaloyl chloride (Phthalyl chloride)	03

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	No.	Chemical name	Sect. Item No.
Picoline (3,4-mixture)	03	1359.000	Pigment Red 17	05
2-Picoline (α-Picoline)	03	1356.000	Pigment Red 21	05
3-Picoline (β-Picoline)	03	1357.000	Pigment Red 22	05
4-Picoline (γ-Picoline)	03	1358.000	Pigment Red 23	05
3-Picoline-N-oxide	03	1359.003	Pigment Red 31	05
Picolinonitrile (2-Cyanopyridine)	03	1359.100	Pigment Red 38	05
3-Picolyamine	03	1361.000	Pigment Red 41	05
Picramic acid, sodium salt	15	136.000	Pigment Red 48	05
Picric acid (Trinitrophenol)	05	143.007	Pigment Red 48-1, (barium)	05
Pigment Black 7	05	143.007	Pigment Red 48-2, (calcium)	05
Pigment black toners, all other	05	144.000	Pigment Red 48-3, (strontium)	05
Pigment Blue 1, (PMA)	05	99.000	Pigment Red 48-4, (manganese)	05
Pigment Blue 1, (PTA)	05	100.000	Pigment Red 49-1, (barium)	05
Pigment Blue 2, (PMA)	05	102.000	Pigment Red 49-2, (calcium)	05
Pigment Blue 2, (PTA)	05	103.000	Pigment Red 52-1, (calcium)	05
Pigment Blue 14, (PMA)	05	111.000	Pigment Red 52-2, (manganese)	05
Pigment Blue 15, (α form)	05	113.010	Pigment Red 53, (sodium)	05
Pigment Blue 15-1, (α form)	05	113.020	Pigment Red 53-1, (barium)	05
Pigment Blue 15-2, (α form)	05	113.030	Pigment Red 57	05
Pigment Blue 15-3, (β form)	05	114.010	Pigment Red 57-1, (calcium)	05
Pigment Blue 15-4, (β form)	05	114.020	Pigment Red 60-1	05
Pigment Blue 19	05	116.000	Pigment Red 63	05
Pigment Blue 25	05	119.000	Pigment Red 66	05
Pigment Blue 61	05	120.061	Pigment Red 81, (PMA)	05
Pigment blue 62	05	120.062	Pigment Red 81, (PTA)	05
Pigment blue toners, all other	05	124.000	Pigment Red 83	05
Pigment Brown 5	05	140.000	Pigment Red 88	05
Pigment Green 1, (PMA)	05	125.000	Pigment Red 101	05
Pigment Green 2, (PTA)	05	128.000	Pigment Red 112	05
Pigment Green 4, (fugitive)	05	129.000	Pigment Red 122	05
Pigment Green 4, (PMA)	05	130.000	Pigment Red 123	05
Pigment Green 7	05	132.000	Pigment Red 146	05
Pigment Green 8	05	133.000	Pigment Red 147	05
Pigment Green 10	05	134.000	Pigment Red 168	05
Pigment Green 36	05	134.260	Pigment Red 169	05
Pigment green toners, all other	05	135.000	Pigment Red 170	05
Pigment Orange 1	05	19.000	Pigment Red 179	05
Pigment Orange 2	05	20.000	Pigment Red 188	05
Pigment Orange 5	05	21.000	Pigment Red 190	05
Pigment Orange 13	05	23.000	Pigment Red 200	05
Pigment Orange 15	05	24.000	Pigment Red 202	05
Pigment Orange 16	05	25.000	Pigment Red 209	05
Pigment Orange 17	05	206.000	Pigment Red 210	05
Pigment Orange 34	05	25.180	Pigment Red 224	05
Pigment Orange 43	05	25.270	Pigment Red 245	05
Pigment Orange 46	05	26.046	Pigment Red 63-1, calcium	05
Pigment orange toners, all other	05	29.000	Pigment red toners, all other	05
Pigment Red 1, (light)	05	48.000	Pigment Violet 1, (fugitive)	05
Pigment Red 2	05	30.000	Pigment Violet 1, (PMA)	05
Pigment Red 3	05	49.000	Pigment Violet 1, (PTA)	05
Pigment Red 4	05	51.000	Pigment Violet 3, (fugitive)	05
Pigment Red 5	05	31.000	Pigment Violet 3, (PMA)	05
Pigment Red 6	05	51.000	Pigment Violet 3, (PTA)	05
Pigment Red 13	05	36.000	Pigment Violet 4, (fugitive)	05
Pigment Red 14	05	37.000	Pigment Violet 4	05
			Pigment Violet 19	05
				39.000
				40.021
				43.000
				44.000
				45.000
				52.000
				54.000
				55.000
				55.100
				55.200
				55.300
				55.400
				57.000
				58.000
				61.000
				62.000
				63.000
				64.000
				67.057
				68.000
				209.000
				70.000
				45.066
				74.000
				75.000
				211.000
				78.000
				79.101
				45.810
				79.320
				80.000
				45.846
				45.847
				80.550
				80.555
				45.870
				80.660
				80.688
				80.770
				84.200
				84.202
				84.209
				84.210
				84.224
				84.245
				70.001
				86.000
				87.000
				88.000
				90.000
				91.000
				92.000
				92.004
				93.160

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Pigment Violet 23	93,200	Polyacrylamide copolymers, all other	14 405,500
Pigment Violet 29	93,229	Polyacrylate methacrylate copolymers	14 427,000
Pigment Violet 39, (PMA)	93,439	Polyacrylate poly(hydroxypropylacrylate) copolymer	14 428,000
Pigment Violet toners, all other	98,000	Polyacrylic acid	15 570,000
Pigment Yellow 1	1,000	Polyacrylic acid, ethyl ester	14 430,000
Pigment Yellow 2	1,500	Poly(acrylic acid, methyl ester)/ethylene/1,1-dichlorosuccinic acid, methylene- with ethyl acrylate	14 423,000
Pigment Yellow 3	2,000	Polyacrylic acid salts, all other	14 425,000
Pigment Yellow 12	9,000	Polyacrylic (ACM) type elastomers	14 434,000
Pigment Yellow 13	10,000	Polyacrylonitrile and acrylonitrile copolymers	10 13,000
Pigment Yellow 14	11,000	Polyacrylonitrile, hydrolyzed	14 391,000
Pigment Yellow 17	6,372	Polyacrylonitrile, starch hydrolyzed polymer	14 435,000
Pigment Yellow 42	6,465	Poly-4-(2-acryloxyethoxy)-2-hydroxybenzophenone	14 436,000
Pigment Yellow 60	6,465	Polyalkylene polyamines and salts and quats	15 144,000
Pigment Yellow 65	6,820	Polyalkylene glycol oleate	12 417,500
Pigment Yellow 73	6,820	Polyalkylene glycol diester	10 13,200
Pigment Yellow 74	6,630	Polyamine polymethane phosphonic acid	12 719,050
Pigment Yellow 75	11,660	Polyamine polymethane phosphonic acid, magnesium salt	14 87,000
Pigment Yellow 97	6,697	Polyamines	14 88,000
Pigment Yellow 98	6,698	Polyamine/tall oil imidazoline	14 437,000
Pigment Yellow 110	14,810	Polybasic acid type alkyl resins	12 413,400
Pigment Yellow 139	14,639	Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)	08 3,000
Pigment Yellow 152	11,752	Polybutadiene emulsion-polymerized	10 13,300
Pigment yellow toners, all other	18,000	Polybutadiene resins	10 14,000
Pinane hydroperoxide	136,200	Polybutadiene solution-polymerized	08 10,000
2-Pinanol (cis and trans)	136,500	Polybutene	02 86,000
β-Pinene	136,800	Polybutene terephthalate (PBT)	08 30,020
α-Pinene	137,000	Polybutylene type resins	08 28,000
α-Pinene epoxide	15 139,000	Polybutyl ether carbamate	14 169,000
α-Pinene oxide	15 139,500	Polycarbonate resins	08 29,000
Pinene, sulfate	15 140,000	Polycarboxylic acid, alkylate	12 719,200
Pinene, wood	141,000	Polycarboxylic acid, alkylphenoxylalkoxylate	12 719,210
Pine oil, natural sulfate	141,385	Polydextrose	10 17,000
Pine oil, synthetic	141,500	Poly(diallyldimethylammonium chloride)	14 438,000
Pine oil, synthetic	14,200	Poly(dimethylimino (2-hydroxytrimethylene) chloride)	14 170,000
Piperacillin	19,200	Poly(epichlorhydrin)	12 762,400
Piperazine	06 123,000	Polyester resins, saturated, all other	08 30,050
Piperazine dihydrochloride	06 125,000	Polyether amines, ethoxylated	12 334,400
Piperazine hexahydrate	06 125,000	Polyether and polyester polyols for urethanes	12 762,730
Piperazine hydrochloride	06 129,000	Polyether triols	08 12,050
Piperazine sulfate	05 129,000	Polyethoxyate/polypropoxyate dibenzyl ether	12 762,800
Piperidine	03 365,000	Polyethylene (80 percent diethylbenzene)	03 1369,000
Piperonal (Heliotropin)	07 98,000	Polyethylene glycol	15 1181,000
Piperylene (1,3-Pentadiene)	02 50,000	Polyethylene glycol butyl ether, propoxylated	15 1161,000
Piroxicam	06 42,500	Polyethylene glycol dibenzoate	11 32,000
Pitch of tar, all other	01 30,000	Polyethylene glycol diester of coconut oil acids	12 684,230
Pitch of tar, hard (M.P. 161° F. and Over)	01 25,000	Polyethylene glycol diester of coconut oil and oleic acids	12 684,300
Pitch of tar, medium (M.P. 110° to 160° F.)	01 27,000	Polyethylene glycol diester of mixed linar acid/oleic acid	12 684,400
Pitch of tar, soft (M.P. 80° to 109° F.)	01 26,000		
Pivaloyl chloride	15 568,000		
2-Hydroxy-1,3-indandione (Pindone)	13 271,000		
Plant growth regulators, acyclic, all other	03 251,590		
Plastics alloys or blends	07 125,200		
Pinyl acetate	07 115,230		
Polyacrylamide	14 403,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Polyethylene glycol diester of tall oil acids	12	684,500
Polyethylene glycol diurethane	12	674,000
Polyethylene glycol dimethacrylate	15	132,000
Polyethylene glycol dimethyl ether	15	1181,200
Polyethylene glycol diolate	12	675,000
Polyethylene glycol distearate	12	676,000
Polyethylene glycol ester of mixed fatty acids	12	684,700
Polyethylene glycol esters of chemically defined acids, all other	12	684,000
Polyethylene glycol esters of mixed acids, all other	12	691,000
Polyethylene glycol hydroxyacetate	12	676,500
Polyethylene glycol monocaprylate	12	677,500
Polyethylene glycol monoester of coconut oil acids	12	685,510
Polyethylene glycol monoester of soybean oil acids	12	685,500
Polyethylene glycol monoester of tall oil acids	12	685,700
Polyethylene glycol monostearate	12	677,600
Polyethylene glycol monolaurate	12	678,000
Polyethylene glycol mono(nonylphenol) ether ammonium sulfate	12	762,970
Polyethylene glycol mono-oleate	12	679,000
Polyethylene glycol mono-oleate, ethoxylated	12	679,100
Polyethylene glycol monopalmitate	12	680,000
Polyethylene glycol monolearginate, methoxylated	12	680,250
Polyethylene glycol monoleargonate	12	680,200
Polyethylene glycol monocinoleate	12	681,000
Polyethylene glycol monostearate	12	682,000
Polyethylene glycol monotallate	12	682,250
Polyethylene glycol sesquilester of coconut oil acids	12	689,000
Polyethylene glycol sesquilester of tall oil acids	12	693,000
Polyethylene glycol sesquilester of tallow acids	12	690,000
Polyethylene glycol sesquiolate	12	683,200
Polyethylene glycol terephthalate	14	442,000
Polyethyleneimine	12	477,250
Polyethyleneimine methyl ammonium sulfate	12	477,250
Polyethyleneoxyamine, alkoxylated	12	334,000
Polyethyleneoxyamine polymer with 1,4-dihydroxy-2-butyne	14	171,000
Polyethylene terephthalate	14	390,000
Polyethylene terephthalate (PET)	08	30,040
Polyglycerol decanoate	12	692,200
Polyglycerol diacetate	12	692,500
Polyglycerol esters, all other	12	696,000
Polyglycerol mono-oleate	12	696,000
Polyglycerol monostearate	12	697,000
Polyglycerol tetraoleate	12	697,450
Polyglycols, ethylene glycol and glycol ether, mixed	15	1184,000
Polyglycols-toluene diisocyanate reaction product	15	144,600
Polyhexafluoropropylene oxide	15	1411,200
Polyhydric alcohol ethers, all other	15	1196,000
Polyhydric alcohol, ethoxylated and phosphated	15	88,800
Polyhydric alcohols, all other	12	1096,000
Polyhydrides and amide-imide polymers	08	34,000
Polyimine, propoxylated	12	238,000
Polyisobutanyl succinic anhydride	14	288,000
Polyisoprene (IR) type	10	19,000
Chemical name	Sect. Item No.	Sect. Item No.
Polyisopropenylphosphinic acid	15	571,400
Polymeric phosphates	09	85,500
Polymerization regulators, acyclic, other	09	173,000
Polymers for fibers, all other	14	394,000
Polymers, water soluble, all other	14	452,000
Polymethacrylic acid esters	15	1411,300
Polymethacrylic acid, sodium salt	14	445,000
Polyethylene polyphenylsilyoxanate	03	1023,000
Poly(1,1-(methylimino)bis(3-chloro-2-propanol) acetate)methylmethacrylate	14	446,000
Poly(1,1-(methylimino)bis(3-chloro-2-propanol) acetate)methylmethacrylate (PMMA)	08	20,040
Poly(methylvinyl ether monoethylmaleate)	15	1181,600
Poly(mixed ethylene, propylene) glycol	12	768,000
Polymyxin B	06	56,000
Poly- α -olefins	14	453,000
Poly- α -olefins, sulfurized	14	454,000
Polyoxyglycidyl ether	15	1317,700
Polyoxyalkene silicones	15	1391,000
Polyoxyalkylated cyclic amines	14	468,000
Polyoxyalkylate (fatty alcohol), phosphate ester	12	112,650
Polyoxyalkylene glycol	15	1181,800
Poly(oxy-1,2-ethanediyl), w-(2-carboxyethoxy)- ω -hydroxy- α , α' -(iminodi-2,1-ethanediyl) bis-, N-tallow alkyl derivs, potassium salt	12	47,490
Poly(oxy-1,2-ethanediyl) α -carboxymethyl,	12	47,500
Poly(oxy-1,2-ethanediyl)- α -carboxymethyl, omega-(tridecyloxy), potassium salt	06	457,000
Poly(oxy-1,2-ethanediyl), α -hydro-w-hydroxy ($C_{12}H_{24}O$) nH_2O	15	1181,900
Poly(oxy-1,2-ethanediyl), α -phenylmethyl-70-hydroxy, C_{18} alkyl ethers	12	763,450
Poly(oxy-1,2-ethanediyl), α -phenylmethyl-70-hydroxy, ethoxylated nonylphenol alkyl ether	12	763,500
Poly[oxyethylene(dimethylimino)ethylene(dimethylimino)ethylene dichloride]	13	195,013
Poly(oxypropylene) diamine	15	297,720
Polyoxypropylene polyoxyethylene glycol, mixed	15	1185,000
Polyphenolic phosphites, polyalkylated	09	86,000
Polyphenyl aromatic ester resins	08	34,500
Poly-m-phenylene isophthalamide	14	392,000
Polyphenylene oxide type resins	08	35,000
Polyphenylene sulfide resins	08	35,500
Poly-p-phenylene terephthalamide	14	393,000
Polypropoxybutyl ether	15	1182,000
Poly(propoxy)butyl ether, ethoxylated	15	1182,005
Polypropylene glycol	12	465,650
Polypropylene glycol, alkoxylated, polymer with maleic anhydride, acrylic acid, and alkylphenol-formaldehyde resin, alkoxylated	15	1186,000
Polypropylene glycol, ethoxylated	12	764,400
Polypropylene glycol, diethylated	12	719,400
Polypropylene glycol, ethoxylated	12	764,000
Polypropylene glycol, ethoxylated, adipic acid ester	12	719,405

Table D-1—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Sect. Item No.</i>
Polypropylene glycol glycerol tri-ether	15	1186, 500
Polypropylene glycol glycerol triether, copolymer with	12	764, 110
epichlorohydrin bisphenol epoxy resin	10	36, 000
Polyolsulfide polymer and copolymer resins	08	38, 000
Polyolsulfide (1) type elastomers	08	38, 100
Polyteraturoethylene (PTEE)	08	38, 100
Polytetrafluoroethylene	15	1267, 000
Polytetrafluoroethylene ethyl iodide	15	1187, 000
Polytetraethylene glycol ether	08	723, 000
Polythiazide	08	13, 040
Polyurethane elastomers	08	13, 040
Polyurethane resins	08	47, 080
Polyvinyl acetate resins	08	46, 000
Polyvinyl alcohol resins	08	46, 000
Polyvinyl butyral resins	08	46, 000
Polyvinyl chloride copolymer resins, all other	08	43, 020
Polyvinyl chloride homopolymer resins	08	43, 010
Polyvinyl formal resin	08	43, 050
Polyvinylidene fluoride resin	08	38, 150
Poly(vinyl- <i>o</i> -sulfo benzal)	14	373, 000
Potassium acetate	15	602, 000
Potassium aminobenzoate	15	392, 000
Potassium benzoate	15	10, 800
Potassium citrate	15	620, 000
Potassium dioxyl phosphorodithioate	12	730, 500
Potassium 2-ethylhexanoate	15	641, 000
Potassium formate	15	653, 000
Potassium gluconate	15	766, 000
Potassium gluconate	15	79, 000
Potassium succinate	14	91, 000
Potassium 2-methyl-2-butanol	15	1411, 600
Potassium oxalate	15	725, 000
Potassium salicylate	15	387, 000
Potassium salt sodium salts of fatty, rosin, and tallow acids, all other	06	
Potassium sodium tartrate	12	74, 000
Potassium stearate	15	768, 000
Potassium stearate	15	761, 500
Potassium warfarin	06	629, 000
Povidone - iodine	06	271, 000
Pramoxine hydrochloride	06	710, 000
Prazosin hydrochloride	06	508, 000
Prednisolone	06	359, 700
Prednisolone acetate	06	664, 000
Prednisone	06	665, 000
Prednisone	06	666, 000
Primary monoamines, all other	06	430, 000
Priming and refractory oil	12	430, 000
Probenzid	01	21, 040
Procaine	06	740, 000
Procainamide hydrochloride	06	616, 000
Procainazine hydrochloride	06	380, 000
Prochlorperazine hydrochloride	06	279, 400
Progesterone	06	683, 000
Progrestins, all other	06	684, 000
Propandamine, 3-(<i>C</i> - <i>C</i> , alkoxy derivatives)	06	
1-Propanaminium, <i>N</i> -ethyl- <i>N</i> , <i>N</i> -dimethyl-3-	12	413, 500
1-Propanaminium, <i>N</i> -ethyl-, ethyl sulfate	12	477, 280
<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Sect. Item No.</i>
1, 3-Propanediolamine, alkoxyolated	12	334, 620
1, 2-Propanediol diphenylacetate	12	639, 080
1, 2-Propanediol diphenylacetate	12	639, 140
1, 2-Propanediol distearate	12	639, 140
1, 2-Propanediol distearate	12	639, 140
Propane diesters, all other	12	704, 000
1, 2-Propanediol d1, 2-ethyl methanoate	12	698, 900
1, 2-Propanediol monoaurate	12	701, 000
1, 2-Propanediol mono-oleate	12	702, 000
1, 2-Propanediol mono-stearate	12	703, 000
3-Propanoic acid, cococarnine, sodium salt	12	31, 500
4-Propanoic acid, sodium salt	12	31, 500
Propranolol hydrobromide	03	485, 500
Propranolol bromide	03	293, 000
Propylamine bromide	07	81, 000
Propylamine, (Anethole)	15	802, 000
Propylaldehyde	15	572, 000
Propionic acid	15	739, 000
Propionic acid salts, all other	15	573, 000
Propionic anhydride	15	573, 000
Propionic anhydride, all other	15	573, 000
Propionic blends	15	1460, 000
Propionitrile	15	450, 500
Propionyl chloride	15	573, 050
Propopyl chloride	15	1374, 000
Propopyl chloride	03	1187, 750
Propoxyethanol (Ethylene glycol monopropyl ether)	14	496, 000
Propoxylated starches	15	413, 000
Propoxyphene hydrochloride	06	414, 000
Propoxyphene napsylate	06	381, 500
Propyl alcohol hydrochloride	06	381, 500
Propyl acetate	15	1050, 000
Propyl alcohol (Propanol)	15	868, 000
Propylamine, mono-	15	301, 000
Propylamine, mono-	15	301, 000
D-Propylanisol (Dihydroanethole)	07	81, 200
S-Propyl butylethylthiocarbamate (Pebulate)	13	206, 000
Propyl chloroformate	15	1050, 400
S-Propyl dipropylthiocarbamate (Vernolate)	13	207, 000
Propylene carbonate	02	42, 000
Propylene carbonate	15	1051, 000
Propylene glycol (1, 2-Propanediol)	15	1093, 000
Propylene glycol, alkoxyolated	15	1187, 900
Propylene glycol t-butyl ether	15	187, 320
Propylene glycol dibenzoate	15	147, 800
Propylene glycol esters of hydrogenated palm oil	12	719, 500
Propylene glycol mono-hydroxy stearate	12	719, 500
Propylene glycol mono-hydroxy sebacate	11	115, 500
Propylene oxide	15	323, 000
Propyl furfurylate	07	115, 400
Propyl gallate	15	148, 000
Propyl glyceride	06	344, 000
n-Propyl mercaptan (1-Propanethiol)	02	96, 000
n-Propyl oleate	11	95, 000
Propyl oleate, sulfated sodium salt	12	262, 000
2-Propyn-1-ol (Propargyl alcohol)	15	869, 000
Protease (bacterial)	14	104, 000
Proteases, all other	14	108, 000
Protein hydroxylates	14	17, 000
Propitilvine hydrochloride	06	533, 000
Pseudoephedrine hydrochloride	06	346, 000
Pseudoephedrine sulfate	06	347, 000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Pseudolone	15	836.000
Pseudo linyl acetate (Neobergamate)	07	166.700
Pyralent pamoate	06	129.300
8,16-Pyranthreneolone	03	1376.200
1,3,6-Pyrenetetrasulfonic acid	03	1377.200
Pyridinecarboxaldehyde	03	1379.500
Pyridine hydrochloride	03	1382.000
3-Pyridinemethanol	03	1383.000
2-Pyridine, refined	03	1378.000
Pyridine, refined all other grades	03	1379.000
2-Pyridinethiol-1-oxide, sodium salt	03	1380.003
2-Pyridinethiol-1-oxide, zinc salt	03	1380.053
Pyridostigmine bromide	06	319.000
4-Pyryliacetone	06	1383.100
Pyryliamine maleate	06	105.000
Pyryliamine tannate	06	107.000
2,4(1H,3H)Pyrimidinedione	15	148.980
Pyrogallol	03	1387.500
Pyromellitic dianhydride	03	1392.000
2-Pyrrolidone (2-Pyrrolidone)	03	1391.000
2-Pyrrolidone-1-ethyl polymer with 1-icosene	15	150.000
4-N-(1-Pyrrolyl)- <i>m</i> -tollenediazonium chloride	15	380.000
Pyvinium pamoate	03	797.200
Quaternary ammonium salts having amide linkages, all other	12	479.000
Quaternary ammonium salts, not containing oxygen, acyclic, all other	12	507.000
Quaternary ammonium salts not containing oxygen, cyclic, all other	12	528.000
Quinolone-2,3-dicarboxylic acid	03	1395.500
Quinolone, other grades	03	1395.000
8-Quinolol	03	1397.000
8-Quinolol, copper salt	13	30.000
8-Quinolol, magnesium salt	13	30.200
8-Quinolol, sulfate salt	13	30.300
<i>p</i> -Quinone	15	14.000
Rapeseed acids (ratio=1/1)	12	549.200
Rare earths 2-ethylhexanoate	15	642.000
Rare earths naphthenate	14	312.000
Rare earths neodecanoate	15	709.750
Reactive Black 5	04	952.000
Reactive Black 9	04	953.000
Reactive black dyes, all other	04	954.000
Reactive Blue 3	04	939.000
Reactive Blue 4	04	940.000
Reactive Blue 5	04	941.000
Reactive Blue 13	04	942.013
Reactive Blue 19	04	943.000
Reactive Blue 21	04	944.000
Reactive Blue 38	04	946.000
Reactive Blue 41	04	946.041
Reactive Blue 71	04	946.071
Reactive Blue 79	04	946.079
Reactive Blue 89	04	946.089
Reactive Blue 173	04	946.173
Reactive Blue 174	04	946.174
Reactive Blue 199	04	946.199
Reactive Blue 203	04	946.203
Reactive blue dyes, all other	04	947.000
Reactive Brown 1	04	949.000
Reactive Brown 17	04	949.017
Reactive Brown 18	04	949.018
Reactive Green 19	04	948.019
Reactive Orange 1	04	912.000
Reactive Orange 4	04	913.000
Reactive Orange 12	04	914.000
Reactive Orange 13	04	915.000
Reactive Orange 14	04	916.000
Reactive Orange 16	04	917.000
Reactive Orange 20	04	917.020
Reactive Orange 78	04	917.078
Reactive Orange 84	04	917.084
Reactive Orange 86	04	917.086
Reactive orange dyes, all other	04	918.000
Reactive Red 2	04	920.000
Reactive Red 8	04	923.000
Reactive Red 11	04	924.000
Reactive Red 21	04	925.000
Reactive Red 29	04	926.000
Reactive Red 31	04	927.000
Reactive Red 33	04	928.000
Reactive Red 43	04	930.043
Reactive Red 49	04	930.049
Reactive Red 94	04	931.094
Reactive Red 120	04	931.120
Reactive Red 141	04	931.141
Reactive Red 147	04	931.147
Reactive Red 180	04	931.180
Reactive red dyes, all other	04	932.000
Reactive Violet 1	04	933.000
Reactive Violet 5	04	936.000
Reactive violet dyes, all other	04	937.000
Reactive Yellow 7	04	904.000
Reactive Yellow 15	04	906.000
Reactive Yellow 17	04	906.000
Reactive Yellow 18	04	907.000
Reactive Yellow 22	04	907.022
Reactive Yellow 37	04	910.000
Reactive Yellow 42	04	910.042
Reactive Yellow 86	04	910.086
Reactive Yellow 125	04	910.125
Reactive Yellow 133	04	910.133
Reactive Yellow 135	04	910.135
Reactive Yellow 160	04	910.160
Reactive yellow dyes, all other	04	911.000
Reactive Red 35	04	928.035
Remlin	14	106.000
Resorcinol	16	272.000
Resorcinol diglycidyl ether	05	151.500
Resorcinol, dimethyl ether	03	1399.500
Resorcinol monobenzoate	15	151.000
Resorcinol, tech.	03	1399.000

Table D-1—Continued
Alphabetical chemical Index

Chemical name	Sect. Item No.	Sect. Item No.
β-Resorcyllic acid, lead salt	1403.000	03
Riboflavin	187.000	07
Riboflavin (animal feed grade)	801.000	06
Riboflavin (medicinal grade)	802.000	06
Riboflavin-5-phosphate, sodium	803.000	06
Ricinoleic acid and acetylricinoleic acid esters, all other	564.950	11
Ricinoleic acid	742.000	12
Ricinoleic acid salts, all other	188.600	15
Rimantidine hydrochloride	115.500	07
Rose oxide	160.000	15
Rosin acid salts, all other	85.000	12
Rosin acids, potassium salt	32.000	12
Rosin acids, sodium salt	66.000	12
Rosin acids, triethanolamine salt	32.000	12
Rosin amines, ethoxylated	14.000	14
Rosin amines	39.000	08
Rosin esters, unmodified (Ester gums)	159.000	06
Roxarsone sodium	180.000	06
Rubber modified polystyrene	44.020	08
Rubber processing chemicals, cyclic, all other	172.000	09
Rust preventing additives	87.000	14
Saccharin (1,2-Benzisothiazolin-3-one, 1,1-dioxide)	85.000	07
Saccharin sodium salt	1404.000	03
Salicylaldehyde	1404.502	03
Salicylaldehyde oxime	1405.000	03
Salicylanilide	181.500	06
Salicylic acid	181.500	15
Salicylic acid, ammonium salt	182.200	15
Salicylic acid magnesium salt	1406.000	03
Salicylic acid, tech.	389.000	06
Salsalate	781.000	15
Salts of organic acids, all other	116.000	07
o-Santalyl acetate	18.000	14
Sarcosine	574.000	15
Sepaclic acid	575.000	15
Sepaclic chloride	460.000	06
Sebacic acid	461.000	06
Sebacic acid sodium	467.000	12
Secondary and tertiary monoamines, all other	473.000	15
Semicarbazide hydrochloride	20.000	06
Semisynthetic penicillins, all other	14.000	14
Silicone fluids	432.000	15
Silicone greases	14.000	08
Silicone resins	21.000	10
Silicone (C) type elastomers	328.500	06
Sinvastatin	556.700	06
Sinvastatin	556.700	06
Skeletal muscle relaxants, all other	482.000	06
Sodium acetate	603.000	15
Sodium aminobenzoate	396.000	06
Sodium aminosalicylate	148.000	06
Sodium ammonium polyacrylate and copolymers	431.000	14
Sodium ascorbate	809.000	06
Sodium benzoate, U.S.P.	12.000	15
Sodium benzoate, tech.	11.000	15
Sodium bitartrate	769.000	15
Sodium n-butylxanthate	142.000	14
Sodium caprylate	137.000	06
1-(Sodium carboxyethylene)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(tail oil fatty acids)		
2-Imidazolium hydroxide	27.100	12
Sodium carboxymethyl amylose	432.000	14
Sodium carboxymethylcellulose (100%)	412.000	14
1-(Sodium carboxymethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(coconut oil fatty acids)-2-imidazolium lauryl sulfate		
Sodium carboxymethyl starch	27.200	12
Sodium citrate	432.200	14
Sodium cresylate	626.000	15
Sodium diacetate	604.000	15
Sodium di-sec-butyl/diethyl phosphorodithioate	731.000	15
Sodium di-sec-butyl phosphorodithioate	732.000	15
Sodium diethyl phosphorodithioate	733.000	15
Sodium dithyrosin	734.000	15
Sodium dithyrosin(2-methoxyethoxy)aluminum hydride	1363.900	15
Sodium disobutyl phosphorodithioate	735.000	15
Sodium diisopropyl phosphorodithioate	642.500	15
Sodium diethylxanthate	144.000	14
Sodium fluoroacetate	232.000	13
Sodium formate, technical	662.000	15
Sodium gluconate	630.000	06
Sodium heparin	674.000	15
Sodium lactate (Nalac)	697.000	15
Sodium mercaptoacetate	1418.000	15
Sodium methoxide (Sodium methylate)	1743.550	15
Sodium-N-methyl-N-oleyl taurate	359.800	06
Sodium nitroprusside	519.500	15
Sodium oleate	726.000	15
Sodium oxalate	433.000	14
Sodium polyacrylate	738.000	15
Sodium propionate	390.000	06
Sodium salicylate	762.100	15
Sodium stearate	1410.100	03
Sodium p-sulfophenylmethyl ether	1410.500	03
Sodium d1-2-sulfosuccinate	742.900	15
Sodium trichlorobenzenesulfate	1410.500	03
Colid type polyvinylidene chloride resins	1108.000	08
Stabilized Sulfur Black 1	1111.000	04
Stabilized Sulfur Black 2	1052.000	04
Solvent Black 5	1053.000	04
Solvent Black 7	1055.000	04
Solvent Black 13	1057.000	04
Solvent Black 26	1057.046	04
Solvent Black 46	1057.047	04
Solvent Black 47	1057.049	04
Solvent Black 49	1020.000	04
Solvent Blue 3	1021.000	04
Solvent Blue 4	1022.000	04
Solvent Blue 5	1028.035	04

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Solvent Blue 36	04	957 000
Solvent Blue 38	04	958 000
Solvent Blue 58	04	959 000
Solvent Blue 59	04	959 016
Solvent Blue 60	04	959 018
Solvent Blue 68	04	963 000
Solvent Blue 99	04	965 000
Solvent Blue 100	04	965 000
Solvent Blue 101	04	967 000
Solvent Blue 102	04	971 000
Solvent Blue 128	04	973 000
Solvent Blue 129	04	973 094
Solvent blue dyes, all other	04	975 000
Solvent Brown 12	04	975 131
Solvent Brown 20	04	975 135
Solvent Brown 22	04	975 143
Solvent Brown 38	04	975 165
Solvent Brown 52	04	975 161
Solvent Green 3	04	975 000
Solvent Orange 2	04	1093 000
Solvent Orange 3	04	1188 000
Solvent Orange 7	04	1188 000
Solvent Orange 20	04	1188 000
Solvent Orange 23	04	1188 300
Solvent Orange 25	04	1190 300
Solvent Orange 31	04	1190 000
Solvent Orange 60	04	1190 000
Solvent Orange 77	04	1190 000
Solvent orange dyes, all other	04	477 350
Solvent Red 1	04	477 360
Solvent Red 23	04	754 700
Solvent Red 34	04	549 300
Solvent Red 25	04	67 000
Solvent Red 27	04	427 000
Solvent Red 42	04	335 000
Solvent Red 49	04	414 000
Solvent Red 63	04	312 000
Solvent Red 74	04	31 100
Solvent Red 111	04	31 400
Solvent Red 164	04	32 000
Solvent Red 166	04	75 000
Solvent Red 168	04	57 000
Solvent Red 169	04	1410 600
Solvent Red 172	04	740 600
Solvent Red 175	04	643 600
Solvent Red 207	04	164 300
Solvent Red 208	04	253 000
Solvent Red 222	04	588 900
Solvent red dyes, all other	04	388 950
Solvent Violet 8	04	414 500
Solvent Violet 9	04	477 390
Solvent Violet 13	04	542 000
Solvent Violet 14	04	565 000
Solvent Violet 38	04	565 000
Solvent violet dyes, all other	04	550 000
Solvent Yellow 3	04	957 000
Solvent Yellow 13	04	958 000
Solvent Yellow 14	04	959 000
Solvent Yellow 16	04	959 016
Solvent Yellow 18	04	959 018
Solvent Yellow 33	04	963 000
Solvent Yellow 40	04	965 000
Solvent Yellow 42	04	965 000
Solvent Yellow 43	04	967 000
Solvent Yellow 46	04	971 000
Solvent Yellow 72	04	973 000
Solvent Yellow 77	04	973 094
Solvent Yellow 97	04	975 000
Solvent Yellow 131	04	975 131
Solvent Yellow 135	04	975 135
Solvent Yellow 145	04	975 143
Solvent Yellow 163	04	975 165
Solvent Yellow 160	04	975 161
Solvent yellow dyes, all other	04	975 000
Sorbitol	15	1093 000
Sorbitol (70% by Weight)	15	1188 000
Sorbitol, ethoxylated	15	1188 000
Sorbitol monoacetate	15	1190 300
Sorbitol propoxylated	15	1190 000
Soyja fatty acids, reaction products with chloromethane and diethylenetriamine, ethoxylated, quarterized	12	477 350
Soyja fatty acids, reaction products with chloromethane and diethylenetriamine, propoxylated, quarterized	12	477 360
Soyja sterols, ethoxylated	12	754 700
Soybean oil acids (Ratio=1/1)	12	549 300
Soybean oil acids, potassium salt	12	67 000
Soybean oil alkylamine	12	427 000
(Soybean oil alkyl)amine, ethoxylated	12	335 000
N-(Soybean oil alkyl)trimethylenediamine	12	414 000
Soybean oil, sulfuric acid sodium salt	12	312 000
Specific gravity 0.940	08	31 100
Specific gravity 0.940 and below	08	31 400
Specific gravity over 0.940	08	32 000
Spectinomycin (animal feed grade)	06	75 000
Spectinomycin (medicinal grade)	06	57 000
Spiro [9H]-1,2-benzoxathiole-3,9-[9H]-xanthene-3',6'-diol-1,1'-dioxide	03	1410 600
Spinolactone	06	740 600
Stannous 2-ethylhexanoate	15	643 600
Stannous octyl pyritillate	15	164 300
Stearamide (Octadecane amide)	15	253 000
Stearamidoethyldiethyamine	15	588 900
Stearamidoethyldiethanolamine acetate	12	388 950
Stearamidoethy-2',7-heptaecyl imidazolium tosylate	12	414 500
Stearamidoethyltrimethylethylenediammonium tosylate and propylene glycol	12	477 390
Stearic acid (Ratio = 2/1)	12	542 000
Stearic acid (Ratio = 1/1)	12	565 000
Stearic acid (Ratio = 2/1)	12	565 000
Stearic acid (Ratio = 1/1)	12	550 000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Stearic acid	12	575.450
Stearic acid- <i>N</i> -aminoethanolamine (amine acid ratio = 1.0/1.65)	12	575.450
Stearic acid- <i>N</i> -aminoethyl ethanolamine (amine/acid ratio = 1.75/1.0)	12	575.500
Stearic acid- <i>N</i> -aminoethyl ethanolamine (amine acid ratio = 1/2)	12	575.505
Stearic acid- <i>N</i> -aminoethyl ethanolamine condensate	12	581.200
Stearic acid- <i>N</i> -ammonium salt	12	67.990
Stearic acid- <i>N</i> -diethanolamine condensate, methyl sulfate	12	389.500
Stearic acid- <i>N</i> -diethanolamine condensate	12	367.000
Stearic acid- <i>N</i> -diethylethanolamine condensate, ethyl sulfate	12	367.500
Stearic acid- <i>N</i> -diethylethanolamine condensate	12	368.000
Stearic acid esters, all other	11	125.000
Stearic acid- <i>N</i> -ethylenediamine condensate	12	368.290
Stearic acid- <i>N</i> -ethylenediamine condensate amine/acid ratio = 1/2	12	586.000
Stearic acid- <i>N</i> -ethylenediamine condensate, monoethoxylated	12	382.000
Stearic acid- <i>N</i> -ethylenediamine condensate, polyethoxylated	12	383.000
Stearic acid ethylene diamine methyl ammonium sulfate	12	501.500
Stearic acid mixed amine	12	369.500
Stearic acid monoethanolamine condensate	12	581.500
Stearic acid, potassium salt	12	68.000
Stearic acid, sodium salt	12	69.000
Stearic acid-tetraethylenepentamine condensate	12	370.000
Stearic acid, N,N',N'',N'''-tetrakis(2-hydroxyethyl)-ethylenediamine salt	12	33.000
Stearic acid, triethanolamine salt	12	34.000
Stearonitrile (Octadecane nitrile)	15	451.000
N-Stearyl-p-aminophenol	09	104.000
Stearyl acid phosphate	15	1035.300
Stearyl alcohol, propoxylated	12	733.310
Stearyl alcohol, propoxylated	12	738.700
Stearylamidopropyl dimethyl amine	12	388.200
Stearylamidopropyl dimethyl amine lactate	15	474.120
Stearylamidopropyl dimethyl myristyl acetate ammonium chloride	12	477.400
Stearyl amine polyphosphoric acid, ethoxylated	15	112.810
Stearylceramide	15	254.000
Stearyl methacrylate	15	1053.000
Stearyl pyrrolidone chloride	12	501.550
Stearyl stearamide	15	254.200
Stearyl stearate	15	979.600
Straight polystyrene	08	44.030
Straight polyvinyl acetate	06	76.000
Strepptomycin	15	219.500
Strotonium	14	313.000
Strotonium naphthenate	15	762.200
Strotonium stearate	15	164.800
Styphnic acid, lead salt	15	164.800
Styphnic acid, magnesium salt	15	164.810
Styrenated-alkyls, or copolymer alkyls	08	3.500
Styrene (Vinylbenzene)	03	1411.000
Styrene-acrylonitrile copolymer resins (SAN)	08	43.000
Styrene-allyl alcohol copolymer resins	08	44.043
Styrene-butadiene, dry type	10	3.100
Styrene-butadiene latexes	08	44.060
Styrene-butadiene latex type	10	3.500
Styrene-butadiene type elastomers, other	10	4.500
Styrene-butadiene-vinylpyridine	10	4.000
Styrene copolymers, all other	08	44.049
Styrene-divinylbenzene copolymer resins	08	44.044
Styrene latexes, all other	08	44.080
Styrene-maleic anhydride copolymer resins	08	44.045
Styrene-methyl methacrylate copolymer resins	08	44.047
Styrene oxide	15	165.000
Styrene type plastics materials, all other	08	45.500
Succinic anhydride	15	165.500
Succinylcholine chloride	06	480.000
Succinyl peroxide	15	1236.500
Sucralfate	06	621.500
Sucrose acetate isobutyrate	11	126.000
Sucrose benzoate	15	166.000
Sucrose, ethoxylated and propoxylated	12	720.100
Sucrose octa-acetate	15	1133.000
Sulfabenzamide	06	208.000
Sulfacetamide, sodium	06	212.000
Sulfadiazine	06	215.000
Sulfadiazine, silver	06	215.200
Sulfadimethoxine	06	217.000
Sulfaguanidine	03	1412.200
Sulfamethazine	06	221.000
Sulfamethazine, sodium	06	222.000
Sulfamethazole	06	223.000
Sulfamethoxazole	06	224.000
Sulfantran	06	227.000
Sulfasalazine	06	232.000
Sulfated animal fats and oils, all other	12	297.000
Sulfated ethers, all other	12	283.000
Sulfated fish and marine fat oils, all other	12	304.000
Sulfathiazole, sodium	06	234.000
Sulfentanil citrate	06	414.600
Sulfisoxazole	06	235.000
Sulfisoxazole, acetyl	06	201.000
m-Sulfobenzoic acid, monosodium salt	03	1416.500
m-Sulfobenzoic acid, 1,3-dimethyl ester	03	1417.000
5-Sulfisophthalic acid, lithium salt	03	1417.300
5-Sulfisophthalic acid, sodium salt	03	1417.500
Sulfonic acids, all other	12	215.000
Sulfonic acids having amide linkages, all other	12	189.000
Sulfonic acids with ether linkages, all other	12	209.000
4,4'-Sulfonidiphenol (4,4'-Dinydroxydiphenyl sulfone)	03	1420.000
4-Sulfopthalic acid	03	1421.000
Sulfosalicylic acid	03	167.000
Sulfosuccinic acid, bis(disisobutyl)ester, amidosodium salt	15	190.000
Sulfosuccinic acid, bis(2,6-dimethyl-4-heptyl)ester, sodium salt	12	191.000
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	12	192.000
Sulfosuccinic acid, diethyl ester, sodium salt	12	194.000
Sulfosuccinic acid, disobutyl ester, sodium salt	12	194.210
Sulfosuccinic acid, dilsodecyl ester, sodium salt	12	194.200

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Sulfosuccinic acid, diisooctyl ester, sodium salt	194, 220	Tall oil, chemically modified	15
Sulfosuccinic acid, dioctyl ester, sodium salt	184, 300	Tall oil fatty acid, midazoline, ethoxylyated	12
Sulfosuccinic acid, dipentyl ester, sodium salt	195, 000	Tall oil fatty acids (Ratio = 2/1)	12
Sulfosuccinic acid, ditridecyl ester, sodium salt	196, 000	Tall oil fatty acids (ratio = 1.5/1)	12
Sulfosuccinic acid, lauryl polyethylene glycol ether ester, disodium salt	195, 450	Tall oil fatty acids, polymerized	12
Sulfosuccinic acid esters, all other	197, 000	Tall oil fatty acids, tetraethanolamine condensate	12
Sulfosuccinic acid, (coconut oil alkyl)iminopropanol half-ester, sodium salt	193, 400	Tall oil fatty acids, triethanolamine salt	12
Sulfosuccinic acid, lanolin ester, disodium salt	190, 410	Tall oil monomer	15
Sulfosuccinic acid, lauramidomethanolamine, disodium salt	196, 440	Tall oil, Pericarey tribitol tialate	15
Sulfosuccinic acid, monolaurate ester, disodium salt	196, 445	Tall oil, refined, ethoxylyated	15
Sulfosuccinic acid, monooleamidopolyethylene glycol ester, disodium salt	196, 495	Tall oil salts, all other (Linoleic-rosin acid salts)	12
Sulfosuccinic acid, myristyl ester, disodium monoethanolamine salt	196, 515	Tall oil, sulfated, ammonia salt	12
Sulfosuccinic acid, oleamidopolyethylene glycol, disodium salt	196, 580	Tall oil, sulfated, sodium salt	12
Sulfosuccinic acid, ricinoleamide monoethanolamine, disodium salt	196, 600	Tallow acids (Ratio = 2/1)	12
Sulfosuccinic acid, sodium salt	196, 800	Tallow acids	12
Sulfur Black 11, 1:1	149, 000	Tallow acids (amine/acid ratio=1.00/1.65)	12
Sulfur compounds, all other	114, 000	Tallow acids, potassium salt	12
Sulfuric acid esters, all other	294, 000	Tallow acids, sodium salt	12
Sulfurized corn oil	317, 000	Tallow acids, triethanolamine salt	12
Sulfurized lard oil	330, 050	Tallow alcohol, ethoxylyated	12
Sulfurized sperm oil substitutes	200, 000	Tallow alkylamine	12
Sulfur orange dyes, all other	202, 000	Tallow alkylamine acetate	12
Sulfur Red 10	1067, 000	Tallow alkylamine, ethoxylyated	12
Sulfur Yellow dyes, all other	1070, 000	Tallow alkylamine, ethoxylyated, diethosulfate	12
Sulindac	1085, 000	(Tallow alkyl)-bis-(2-hydroxyethyl) methylammonium chloride	12
Sympathomimetic (adrenergic) agents, all other	349, 000	N-(Tallow alkyl)propylpentriamine	12
Synthetic fatty alcohol ester, sulfated, sodium salt	302, 500	N-(Tallow alkyl)-5-iminopropionic acid, disodium salt	12
Synthetic sweetener material, all other	388, 000	N-(Tallow alkyl) trimethylenediamine	12
Tall oil acids	541, 000	N-(Tallow alkyl) trimethylenediamine acetate	12
Tall Oil Acids	520, 000	N-(Tallow alkyl) trimethylenediamine, ethoxylyated	12
Tall oil acids/aminomethylpiperazine condensate	370, 900	Tallow amide, hydrogenated	12
Tall oil acids, dibutylamine salt (Condensate)	34, 300	Tallow amine, ethoxylyated, quarternary ammonium salt	12
Tall oil acids-dimethylenediamine condensate (Amine acid ratio = 1/1)	371, 000	Tallow, R-3-(dimethylamino)propyl (amine/ acid ratio=1/3)	12
Tall oil acids, ethoxylyated	587, 500	(Tallow ethyl alkyl) amine, ethoxylyated, sulfate	12
Tall oil acids, ethoxylyated and propoxylyated	672, 400	Tallow fatty acids-aminomethylmethanolamine condensates	12
Tall oil acids, oxobottom ester, sulfated, sodium salt	672, 420	Tallow fatty acids, ethoxylyated	12
Tall oil acids-polyalkylenepolyamine condensate	268, 650	Tallow nitro	15
Tall oil acids-polyalkylene polyamine condensate, salts, with dodecylbenzene sulfonic acid and/or tall oil fatty acids	372, 000	Tallow, sulfated, sodium salt	12
Tall oil fatty acids	372, 010	Aminic acid, N,F	15
Tall oil acids, potassium salt	70, 000	Ammonium salt	14
Tall oil acids, sodium salt	71, 000	Ammonium salt, synthetic, all other	14
Tall oil acids, sulfated, sodium salt	268, 700	ar bases crude bases (Dry basis)	01
Tall oil acids, triethanolamine salt	34, 360	ar distillates, all other	01
Tall oil acyl chloride	167, 400	ar for other uses crude	01
3-(Tall oil amino)propyl amine	414, 500	ar for other uses refined	01
		ar, road	01
		araric acid salts, all other	01
		aroyl acetate	05
		erazolin	06
		erbutaline sulfate	06
		erprithalic acid	03
		erprithalic acid, dimethyl ester	03
		erprithaloyl chloride	03
		Terfenadine	06

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Terpene hydrocarbons, monocyclic (Solvenol)	15	1, 2, 3, 4-Tetrahydrophthalene (Tetraim)	15
Terphenyl (Phenylbiphenyl) (m-, o-, and p-isomers)	1428.000	1, 2, 3, 4-Tetrahydro-2-naphthol	03
Terphenylene	1428.500	Tetrahydrofurfural from tall oil fatty acids and propylenediamine	14
Terpinene-4-ol	117.000	2, 2', 3, 3'-(1,4-indene-3, 3', 3'-tetramethyl-1,1'-bisphenoxy)ethane	03
α -Terpineol	120.000	Tetrahydrothiophene	15
α -Terpinyl acetate	371.000	Tetrahydrothiophene-1,1-dioxide (Sulfolane)	15
α -Terpinyl propionate	327.500	2, 2', 4, 4'-Tetrahydroxybenzophenone	14
1-Tert-butyl-2,5-dimethoxybenzene	1283.200	Tetrahydrozoline hydrochloride	06
Tertiary amyl per-2-ethylhexanoate	641.800	Tetra-isopropoxy titanium (bis dicycyl) phosphite	15
Tetostearone	642.000	Tetraisopropyl titanate	15
Tetostearone epiginate	642.300	Tetraakis(2-chloroethyl)ethylene diphosphate	15
Tetrasorbomphenol A	184.000	Tetraakis(2-chloroisopropyl)ethylene diphosphate (T-RDT)	15
1,1,2-Tetrabromethane (Acetylene tetrabromide)	1214.000	Tetraakis(2-ethylhexyl) titanate	15
Tetrabromophthalic anhydride	509.000	N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	12
Tetrabutylammonium bromide	421.600	N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine, propoxylated	12
Tetra Butyl ammonium hydrogen sulfate	477.850	N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylenediamine, propoxylated and glyoxylated	12
Tetraethyl titanate	1060.000	N,N,N',N'-Tetrakis(3,5-di- <i>t</i> -butyl-4-hydroxyphenylene(3,5-di- <i>t</i> -butyl-4-hydroxyphenylmethoxymethyl)ethane)	15
Tetraecaine hydrochloride	715.100	1,1,3,3-Tetraaminothoxypropane	12
2,4,5,6-Tetrachloroisophthalonitrile	31.200	Tetra methyl ammonium chloride	12
Tetrachlorophthalic anhydride	1435.600	Tetrapropyl ammonium chloride	12
Tetraacrylone	37.000	1,1,1,3-Tetraethyl-5-butenediamine	03
1-Tetradecane	501.604	2,4,7,9-Tetraethyl-5-decyl-4,7-diol, ethoxylated	12
n-Tetradecanamine, N,N,N-trimethyl-chloride	1348.500	Tetraethyl ethylenediamine	15
1-Tetradecanamine, N,N,N-trimethyl-	879.000	Tetraethyl octahydro acetophenone	07
1-Tetradecanol (Myristyl alcohol)	784.500	Tetraethyl octahydro acetyl naphthalene	07
(ditridecyl) phosphite	501.610	1, 3, 6-Tetramethylphenol ether	03
Tetraethyl ammonium bromide	474.500	1, 3, 6-Tetranitro-9H-carbazole	12
Tetraethyl ammonium chloride	501.612	Tetra octoxy titanium (bis-tridecyl phosphite)	15
Tetraethylene glycol	1195.000	Tetra propyl silicate	15
Tetraethylene glycol diacrylate	1131.000	Textile chemicals, other than surface active agents, all other	14
Tetraethylene glycol dimethacrylate	1136.000	Thebaine	06
Tetraethyleneepentamine	303.000	Theoplyline sodium glycolate	06
Tetraethyl lead	186.000	Thermoplastic resins, benzoid, all other	08
O,O',O'-Tetraethyl S,S'-methylene bisphosphorodithioate (Ethion)	227.000	Thermosetting acrylate resins	08
Tetraethyl orthosilicate (Tetraethyl silicate)	1054.000	Thermosetting resins, benzoid, all other	08
Tetrafluoroethylene, monomer	1270.000	Thermosetting resins, nonbenzoid, all other	08
Tetrafluoromethane (F 14)	501.635	Thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, polyester)	10
Tetrahydroalcolimerol(50/50 mixture of tetrahydrolinolal and tetrahydro-myrcenol)	189.140	Thiazole	16
Tetrahydrobenzyl alcohol	1437.402	1, 3-Thiazole	04
Tetrahydro-3,5-dimethyl-2(1H)-pyrimidinone [3-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]ethoxy]-2-propenylidene]hydrozone	186.028	Thiazole, 2,5-bis(dialkylidithio) derivatives	14
Tetrahydro-5,8-dimethyl-2(1H)-pyrimidinone[3-[4-(trifluoromethyl)phenyl]-1-2-4-(trifluoromethyl)phenyl]-2-propen	166.053	Thiamine hydrochloride	06
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-phenyl]-2-propen	12.000	Thiamine monochloride	06
2-Thione (DMTT)	1438.000	Thiazolyl sodium	06
Tetrahydrofuran	53.000	Thiazole derivatives, cyclic, other	09
Tetrahydrofurfuryl alcohol	53.000	Thioacetic acid, potassium salt	15
Tetrahydrofurfuryl oleate	189.170		
Tetrahydrofurfuryl			

Table D-1—Continued
Alphabetical chemical index

<i>Chemical name</i>	Sect. Item No., No.	<i>Chemical name</i>	Sect. Item No., No.
Thiocarbamide (Diphenylthiourea)	13	p-Toluenesulfonamide	1459,000
Thiocyanic acid, methylene ester	14	Toluenesulfonamide o-, p-mixtures	54,000
2-(Thiocyanomethylthio)benzothiazole	13	p-IP-(Toluenesulfonamido)diphenylamine	83,000
2,2'-Thiodiethanol (Thiodiglycol)	15	p-Toluenesulfonic acid	1461,300
Thiodiethylene bis(3,5-di-tert-butyl-4-hydroxyhydroquinamat	15	Toluenesulfonic acid, aniline salt	146,000
Thiodiphenol	03	Toluenesulfonic acid, potassium salt	147,000
O,O'-(Thiodi-4,1-phenylene)bis(o,o-dimethyl phosphorothioate (Temphos))	13	o-Toluenesulfonic acid, sodium salt	146,000
3,3'-Thiodipropionic acid	15	p-Toluenesulfonylhydrazide	110,743
3,3'-Thiodipropionitrile	15	p-Toluenesulfonyl isocyanate	1025,700
Thiodisuccinic acid	15	p-Toluenesulfonylsemicarbazide	109,800
Thioethanol, sodium salt	15	Toluene xylene sulfonic acid	147,500
Thioethacetic acid	15	m-Toluic acid, methyl ester	1469,000
Thionicotinamide	03	o-Tolidine	1471,202
Thionipental, sodium	06	m-Tolidine	1473,000
Thiophene	15	m-Tolidine	1474,000
Thiosemicarbazide	03	m-Tolidine, ethoxylated	1475,000
Thiostrepton	15	2-o-Tolidinoethanol	356,200
Thiothixene hydrochloride	06	p-Toluyol chloride	1478,000
Thiourea resins	08	p-Tolyl acetate	1482,202
Thuringiensin	06	2,2'-(m-Tolylimino)diethanol	89,000
Thyroglobulin	06	2,2'-[m-Tolylimino]diethanol	1487,000
Thyroid	06	p-Tolyl isobutyrate	90,100
Ticarcillin, disodium	06	p-Tolyl octanoate	90,600
Tilomisole	06	p-Tolylphenylacetate	1487,700
Tinolol maleate	06	Tolyltriazole	770,000
Tin laurate	15	Tretinol (vitamin A acid)	1487,200
Titanic acid esters, all other	15	1,2,4-Triacetoxybenzene	1036,000
Titanium acetylacetonate	15	Trialkyl phosphite	1036,200
N-2(C-5 to C-17)alkylamido-N-carboxyethyl N-2-dioxymethyl, 3-amino-2-methoxypropyl phosphate, disodium salt	15	Trialkyl thiophosphite	258,200
Tobramycin	12	Triallylamine	105,200
Tocainide	06	Triamcinolone	667,000
d- α Tocopherol	06	Triamcinolone acetonide	668,000
d- α Tocopherol	06	Triamcinolone diacetate	669,000
d- α Tocopheryl acetate	06	2,4,6-Triamino-5-nitrosopyrimidine	1487,802
d- α Tocopheryl acetate (animal feed grade)	06	Triamterene	741,000
d- α Tocopheryl acetate (medicinal grade)	06	Triaryl phosphites	86,500
d- α Tocopheryl acid succinate	06	1,3,5-Triazine-(1,3,5(2H,4H,6H))-tristhanol	200,170
Tolazamide	06	Tribasic lead maleate	689,000
Tolbutamide	06	2,4,6-Tribromophenol	1488,289
p-Tolaldehyde	07	3,4',5'-Tribromosalicylanilide	1489,000
Toluene-2,3-(and 3,4)-diamine (35/65 Mixture)	03	Trif(2-butoxyethyl) phosphate	102,000
Toluene-2,4-diamine (4-m-Tolylenediamine)	03	Tributyl acetylacrylate	71,100
Toluene-2,4-(and 2,6)-diamine (80/20 Mixture)	03	Tri-n-butylaluminum	1363,950
Toluene-3,4-diamine	03	Tri-n-butylamine	266,000
Toluene 2,4-and 2,6-dioscyanate	03	Tributyl citrate	71,200
Toluene 2,4-and 2,6-dioscyanate (80/20 Mixture)	03	Tributylmethylammonium chloride	501,750
Toluene 2,4-and 2,6-dioscyanate (85/35 Mixture)	03	Tributyl phosphate	1039,000
Toluene (Toluol) other grades	01	Tributyl phosphite	289,000
Toluene High purity (98-100%)	02	S,S'-Tributyl phosphorothioate	208,000
Toluene Other	02	Tributyltin chloride	195,016
		Tributyltin fluoride	1406,000
		Tricassor oil alkylphosphate	786,000
		Trichloroacetic acid	584,000
		Trichloroacetonitrile	455,400

Table D-1-Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
1,2,3 (and 1,2,4)-Trichlorobenzene	03	1490,000
1,2,4-Trichlorobenzene	03	1491,000
1,1,1-Trifluoro-2,2-bis(p-methoxyphenyl)ethane (Methoxybuparalide)	13	146,000
3,4,4-Trichlorobuparalide	15	203,000
1,1,1-Trifluoro-2,2-diphenylethane	03	1492,200
1,1,1-Trichloroethane (Methyl chloroform)	15	1245,000
1,1,2-Trichloroethane (Vinyl trichloride)	15	1246,000
Trichloroethylene	15	1247,000
Trichlorofluoromethane (F 11)	15	1272,000
Trichloromelamine	15	203,500
α -(Trichloromethyl)benzyl acetate (Rosetone)	07	91,000
Trichloromethylsilane	15	1394,000
3-Trichloromethyl-1,2,4-thiadiazole	03	1492,500
N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide (Captan)	13	34,000
N-Trichloromethylthiophtalimide (Folpet)	13	35,000
1,2,4-Trichloro-3-nitrobenzene	03	1493,000
Trichloronitromethane (Chloropicrin)	13	242,000
2,4,6-Trichlorophenylhydrazine	03	1493,500
Trichlorophenylsilane	03	1494,000
Trichloropropylsilane	15	1395,000
3,5,6-Trichloro-2-pyridinyloxyacetic acid	13	118,064
3,5,6-Trichlorosalicylic acid	03	1494,500
α , α , α -Trichlorotoluene (Benzotrithoride)	03	1495,000
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	03	1499,000
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)	15	204,000
Trichlorotrifluoroethane	15	1273,000
Trichlorovinylsilane	15	1396,000
Tricresyl phosphate	11	14,000
Tricyclohexylin hydroxide	13	166,031
1-Tridecanol	15	880,000
Tridecyl alcohol, ethoxylated and phosphated, polyalkylene polyamine salt	12	90,010
Tridecyl alcohol, ethoxylated	12	769,000
Tridecyl alcohol, ethoxylated and carbonated, sodium salt	12	319,000
Tridecyl alcohol, ethoxylated and phosphated	12	90,000
Tridecyl alcohol, ethoxylated and sulfated sodium salt	12	282,000
Tridecyl alcohol, propoxylated and ethoxylated	12	770,000
Tridecylbenzenesulfonic acid	12	139,100
Tridecylbenzenesulfonic acid, sodium salt	12	139,200
Tridecylpoly(ethyleneoxy)acetic acid, sodium salt	12	50,000
Tridecylpoly(ethyleneoxy)propionic acid, sodium salt	12	18,500
3-(3-Tridecyl(oxy)propyl)aminopropyl amine	12	339,600
Tridecylphenol, ethoxylated	12	756,000
Tridecyl phosphate	12	110,300
Tridecyl stearate	15	980,000
Tridecyl stearate	11	124,800
Tridecyl sulfate, sodium salt	12	246,000
Tris(dimethylaminoethyl)phenol	03	1499,208
Triethanolamine	15	204,500
Triethanolamine, ethoxylated	15	381,000
Triethanolamine, ethoxylated	12	340,000
Triethanolamine phosphate ester	12	340,050
Triethanolamine salicylate	12	340,100
Triethanolamine titanate	15	1062,500
Triethyl acetylacrylate	11	71,300
Triethylaluminum	15	1364,000
Triethylamine	15	279,000
Triethylborane	15	1368,800
Triethyl borate	15	1368,804
Triethylboron	15	1368,830
Triethyl citrate	11	71,400
Triethylenediamine	15	305,600
Triethyleneglycol	15	1194,000
Triethyleneglycol di(caprylate-caprate)	15	127,000
Triethyleneglycol di(2-ethylbutyrate)	11	128,000
Triethyleneglycol di(2-ethylhexanoate)	11	129,000
Triethylenetetramine	15	306,000
Triethylenetetramine, propoxylated	15	482,500
Tri(2-ethylhexyl) trimellitate	11	54,750
Triethyl orthoacetate	15	1064,000
Triethyl orthoformate	15	1065,000
Triethyl orthopropionate	15	1066,000
Triethyl phosphate	11	103,000
Triethyl phosphite	15	1040,000
Triethyltrimethylenetetramine	09	7,000
Trifluoroacetic acid	15	584,009
Trifluoroacetic anhydride	15	584,010
Trifluoroacetyl chloride	15	584,015
α , α , α -Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (Trifluralin)	13	116,000
α , α , α -Trifluoro-2,6-dinitro-N-ethyl-N-(2-methyl-2-propenyl)-p-tolidine (Ethylfluralin)	13	116,100
Trifluoroethanol	15	1273,490
Trifluoropropene	12	1273,550
Triglycerol monooleate	15	697,550
Tris-n-hexyl aluminum	15	1364,900
Tris-n-hexyltrimellitate	11	54,850
Trihydrogenated tallow ammonium chloride	12	501,800
Trisobutylaluminum	15	1365,000
Trisobutylene polysulfide	15	1365,000
Trisodocyclamine	14	283,000
Trisodocyclamine	12	444,300
Trisodocyl trimellitate	15	1040,500
Trisononyl trimellitate	11	54,900
Triso-octyl phosphite	15	1041,000
Triso-octyl trimellitate	11	55,000
Trisopropanolamine	15	409,000
Trisopropyl phosphite	15	1042,000
Trilaurylamine	12	444,600
Trimellitic acid esters, all other	11	57,000
Trimellitic acid anhydride, acid chloride	03	1509,100
Trimellitic trichloride	03	1509,300
Trimer dibasic acids	15	584,100
Trimesic acid	03	1510,000
Trimethobenzamide hydrochloride	06	82,000
Trimethoprim	06	275,000
Trimethoxyboroxine	15	1369,000

Table D-1—Continued
Alphabetical chemical Index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Tri(methoxymethyl) tr(stearoxymethyl) melamine	15 205, 500	Tri(mixed alkyl) amine	12 444, 700
Tri(methoxysilyl) propyl diacyl methylammonium chloride	15 1397, 050	2,4,6-Trinitroresorcinol and lead derivative	15 208, 000
Triethylaluminum	15 1386, 000	Tri-n-octylaluminum	15 1366, 400
Triethylamine	15 292, 000	Tri-n-octylamine	12 445, 000
Triethylamine hydrochloride	14 433, 375	Tri-n-octyl-n-decyl trimellitate	11 58, 000
Triethylamine hydrochloride polymer	14 448, 500	Tri-n-octyltrimellitate	11 58, 000
1,2-Di(2-amethylphenyl) acrylate	03 1513, 000	Tri-n-octylammonium tri-isopropoxide	15 1369, 500
1,2-Di(2-amethylphenyl) benzene (Pseudocumene)	03 1513, 100	Tri-n-octylamine	08 111, 000
1,3,5-Trimethylbenzene (Mesitylene)	07 169, 700	Tri-n-octylamine citrate	06 112, 000
Triethyl benzyl chloride	07 169, 700	Tri-n-octylamine hydrochloride	08 112, 000
Triethyl chloroacetate	15 206, 940	Tri-n-octylamine	08 113, 000
Triethyl-1-cyclohexane	15 206, 950	Triphenylmethane	03 1529, 602
3,3,5-Trimethylcyclohexanol (m-homomenthol)	07 121, 800	Triphenyl phosphite	03 1529, 700
3,3,5-Trimethyl cyclohexanol (m-Homenthol)	07 121, 800	Triphenyl phosphine	03 1529, 700
3,5,5-Trimethyl-2-cyclohexene-1-one (Isophorone)	15 207, 000	Triphenyl phosphite	03 1529, 700
Triethyl cyclohexenyl butenone	07 121, 850	Triphenylsulfonium chloride	03 1529, 750
1-(2,6-Trimethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one (Allyl- α -ionone)	07 122, 000	Triphenylsulfonium hydroxide	06 211, 200
Triethylcyclohexyl salicylate	07 91, 080	Tripyridine hydrochloride	06 304, 000
2,12-Trimethyl-3-(dichloroacetyl)-1,3-oxazolidine	07 169, 500	Tripropylamine	15 1195, 000
1,1,3-Tris(2-methyl-4-hydroxy-5-tert-butylphenyl) butane	09 95, 000	Tripropylene glycol	15 1195, 000
1,3,3-Trimethyl- δ^2 - α -Indolineacetaldehyde	03 1515, 000	Tripropylene glycol diacrylate	15 1195, 600
N,N,N-Trimethyl methanaminium octahydrodrotroborate	15 1370, 500	Tripropylene glycol monomethyl ether	15 1043, 938
1,3,3-Trimethyl-2-methanaminium octahydrodrotroborate	03 1516, 000	Tri(2-chloroethyl) phosphate	15 1045, 400
Triethyl(trimixed alkyl) ammonium chloride	12 502, 000	Tri(2-chloroethyl) phosphite	15 1045, 400
2,6,8-Trimethyl-4-nonanol	15 881, 000	Tris(3,5-di-tert-butyl- γ -hydroxybenzyl)isocyanurate	15 211, 400
2,6,8-Trimethyl-4-nonanone (Isobutyl heptyl ketone)	15 838, 000	α , α' , α'' -Tris(dimethylamino)mesitol	03 1525, 000
Triethylnonyl alcohol, ethoxylated	07 122, 020	Tris(2-ethylhexyl)phosphite	15 1048, 000
Triethyl norbornane methanol	12 503, 000	Tris(2-methoxyethoxy)vinyl silane	15 1396, 500
Triethyl octadecylammonium chloride	12 774, 000	Tris(2-methyl-1-aziridinyl)phosphine oxide	03 1526, 000
Triethylolpropane, alkoxylated	15 1139, 000	Tris(pentamethylsiloxy)-3-methacrylatopropylsilane	15 1397, 500
Triethylolpropane decanoic acid ester	14 291, 000	Tri- and tetraethyl glycol monoethyl ethers, borate esters	15 1193, 800
Triethylol propane ester	15 1139, 400	Tri(tridecyl)amine	12 446, 100
Triethylolpropane ethoxylate triacrylate	15 1140, 000	Tubocurarine	06 481, 000
Triethylolpropane triacrylate	15 1140, 005	Tylosin	06 77, 000
Triethylolpropane tris(2-mercaptopyronate)	15 1140, 010	Undecanal	07 170, 000
Triethylolpropane trimethacrylate	11 95, 700	9-Undecenal	15 869, 700
Triethylolpropane trioleate (TMP-trioleate)	15 1140, 300	Urea-formaldehyde resins	08 171, 000
Triethyl orthoacetate	15 1066, 200	Urea in feed compounds (100% Basis)	14 509, 000
Triethyl orthotermate	15 1068, 000	Urea in liquid fertilizer (100% Basis)	14 510, 000
2,2,4-Trimethylpentane (iso-octane)	02 76, 000	Urea in plastics (100% Basis)	14 512, 000
2,2,4,4-Trimethyl-1,3-pentanediol	15 1095, 000	Urea in solid fertilizer (100% Basis)	14 513, 000
Triethylpentanediol, ethoxylated	12 773, 500	Urea polymers with formaldehyde and methanol	14 503, 000
2,2,3,3-Trimethyl-1,3-pentanediol monoisobutyrate	15 1140, 500	Urea, polymer with tetrahydroxymethylphosphonium sulfate	14 506, 000
Triethyl phosphite	15 1043, 000	Urea, primary solution (Report on 100% urea-content basis)	14 508, 000
Triethylsilyldiaco-methane	15 1397, 200	7,7'-Urylenebis(4-hydroxy-2-naphthalenesulfonic acid (J-Acid urea))	03 1528, 000
Triethyl(soybean oil alkyl)ammonium chloride	12 504, 000	Uricase	14 824, 000
Triethyl(tallow alkyl)ammonium chloride	12 505, 000	Valeraldehyde (Pentanal)	15 180, 000
Triethyltetradecylammonium bromide	12 506, 000	Valeric acid	15 585, 000
Triethyl trimellitate	11 55, 400	Valeryl chloride	15 585, 000
a,a,9-Trimethyl-5-vinyl-furanyl alcohol and tetrahydro-2,2,6-trimethyl-6-vinyl-3-ol	07 122, 200	Valproic acid	06 423, 900
5-(2,2,3-Trimethyl)cyclopent-3-en-1-yl)-3-methylpentan-2-ol	07 122, 010		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Vancomycin	61,000	Vinyl trimethoxy silane	15
Vanillin	44,400	Violet 5:1	05
Vanillin propylene glycol acetal	1206,016	Violet 27	05
Vat Black 16	4,400	Vitamin A, all other	06
Vat Black 25, 12-1/2%	1209,000	Vitamin D, all other	06
Vat Blue 1, 20%	1164,000	Vitamin A acetate (animal feed grade)	06
Vat Blue 6, 8-1/3%	1167,000	Vitamin A acetate (medicinal grade)	06
Vat Blue 16, 16%	1171,000	Vitamin A alcohol	06
Vat Blue 19	1172,019	Vitamin A palmitate (medicinal grade)	06
Vat Blue 20, 14%	1173,029	Warfarin	06
Vat Blue 29	1175,000	Waxes and paraffinic products	09
Vat Blue 43	1175,066	Wool wax alcohols, ethoxylated	12
Vat Blue 66	1187,000	Xanthan gum	14
Vat Brown 1, 11%	1187,000	o-Xylene (90-100% of o-xylene isomer)	03
Vat Brown 57, 12.8%	1200,000	m-Xylene (90-100% of m-xylene isomer)	03
Vat brown dyes, all other	1201,000	p-Xylene (90-100% of p-xylene isomer)	03
Vat Green 1, 6%	1178,000	Xylene High purity (98-100%)	02
Vat Green 3, 10%	1180,000	Xylene Other	02
Vat Green 7	1180,007	2,4-Xylenesulfonic acid	03
Vat Green 8, 8-1/2%	1182,000	Xylenesulfonic acid, ammonium salt	12
Vat Green dyes, all other	1186,000	Xylenesulfonic acid, mixed isomers	03
Vat Orange 2, 12%	1131,000	Xylenesulfonic acid, sodium salt	12
Vat Orange 7, 11%	1136,000	2,5-Xylenol	03
Vat Red 10, 18%	1144,000	2,6-Xylenol	03
Vat Red 15, 10%	1148,000	3,5-Xylenol	03
Vat red dyes, all other	1154,000	Xylenol crystals	03
Vat Violet 1, 11%	1155,000	Xylenol, low boiling point	03
Vat Violet 13, 6-1/4%	1159,000	Xylidine, original mixture	03
Vegetable glycerides, hydrogenated	1330,400	Xylidine, intestinal malabsorption test	06
Vegetable oils, sulfated, all other	1329,000	Zeranol	05
Veratraldehydes (3,4-Dimethoxybenzaldehyde)	1619,000	Zinc acetate	15
Very high molecular weight (>1000) hydrocarbons	14	Zinc acetylacetonate complex	15
Vetivonnol	292,000	Zinc t- α -alkylcarboxylate	15
Vetivonnol acetate	124,000	Zinc citrate	15
Viblastine sulfate	285,000	Zinc dialkyldithiophosphate	14
Vincristine sulfate	282,000	Zinc dialkylphenol dithiophosphate	14
Vinyl acetate-acrylate copolymers	565,080	Zinc dibutyl phosphorodithioate	14
Vinyl acetate, monomer	1989,000	Zinc 2-ethylhexanoate	05
Vinyl bromide (bromoethylene)	1215,000	Zinc gluconate	06
Vinyl chloride-acetate copolymer resins	50,080	Zinc hydrocarbon dithiophosphate	14
Vinyl chloride, monomer (Chloroethylene)	1520,000	Zinc isopropyl xanthate	14
Vinylcyclohexene monoxide	1531,503	Zinc laurate (Activator, physical property improver, and processing auxiliary)	09
Vinyl fluoride, monomer	1274,000	Zinc naphthenate	15
Vinylidene chloride, monomer (1,1-Dichloroethylene)	1275,000	Zinc neodecanoate	15
Vinylidene fluoride, monomer	1535,000	Zinc phenolsulfonate	06
2-Vinylpyridine	1536,000	Zinc salicylate	06
4-Vinylpyridine	1516,000	Zinc stearate	15
1-Vinyl-2-pyrrolidone other copolymers	214,000	Zinc tallate	15
1-Vinyl-2-pyrrolidone-methylacrylic acid, dimethylamine ethyl ester, copolymer	215,000	Zinc undecylenate	06
1-Vinyl-2-pyrrolidone, monomer	14	Zirconium acetate	15
1-Vinyl-2-pyrrolidone, polymers	217,000	Zirconium t- α -alkylcarboxylate	15
1-Vinyl-2-pyrrolidone vinyl acetate copolymer	51,000	Zirconium neodecanoate	15
Vinyl resins, all other	3,800		
Vinyl toluene alkyls	1988,000		
Vinyltriethoxysilane	15		

