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SYNTHETIC ORGANIC CHEMICALS

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United States Production
and Sales, 1989

(Investigation No. 332-135)



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United States International Trade Commission
Washington, DC 20436



UNITED STATES INTERNATIONAL TRADE COMMISSION

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UNITED STATES INTERNATIONAL TRADE COMMISSION

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United States Production and Sales, 1989

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Introduction

This is the 73rd 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 698 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 are 450 kilograms of production or sales or \$1,000 of value of sales for organic pigments, medicinal chemicals, flavor and perfume materials, rubber-processing chemicals, elastomers, and those chemicals whose end-use is not readily determinable; 2,250 kilograms or \$5,000 for coal tar, tar crudes and pitches, primary products from petroleum and natural gas for chemical conversion, dyes, plasticizers, surface-active agents, and pesticides; 4,500 kilograms or \$10,000 for cyclic intermediates and miscellaneous cyclic and acyclic chemicals; 9,000 kilograms or \$20,000 for miscellaneous end-use chemicals and products; and 22,500 kilograms for \$50,000 for plastics materials. Data are usually supplied in terms of undiluted materials; however, for reporting purposes, 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 Commissions 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

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

from petroleum and coal tar, and certain chemically described natural products, such as, alkaloids, enzymes, and perfume isolates. It is the sum—expressed in terms of 100 percent 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 percent owned subsidiaries or affiliates;

Produced and sold to, or bartered with, other firms (including less than 100 percent 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 percent.

SALES EXCLUDE:

All intra-company transfers within a corporate entity;

All shipments to 100 percent 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, coal tar, and primary products from petroleum and natural gas in 1989 was 172,977 million kilograms—a decrease of 1.6 percent from the output in 1988 (which also included data on tars) (table 1). Sales of these materials in 1989, which totaled 98,382 million kilograms, valued at \$96,071 million, were 0.2 percent larger than in 1988 in terms of quantity and 2.9 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 1985–89, the total output of these products rose each year except for 1989 (figure 1). During that period the output of these products generally followed the trend of the Federal Reserve Board Index of U.S. Production, except for 1989.

In 1989, production of all synthetic organic chemicals, including cyclic intermediates and finished products totaled 121,378 million kilograms, or 2.1 percent less than the output in

1988. Six sections showed an increase in production in 1989 over 1988. Dyes (174 million kilograms) increased by 37.1 percent; medicinal chemicals (130 million kilograms) increased by 11.3 percent; rubber-processing chemicals (176 million kilograms) increased by 9.9 percent; pesticides and related products (572 million kilograms) increased by 8.4 percent; miscellaneous end-use chemicals and chemical products (13,503 million kilograms) increased by 4.3 percent; miscellaneous cyclic and acyclic chemicals (48,804 million kilograms) increased by 1.6 percent; of the remaining sections, flavor and perfume materials (64 million kilograms) showed a decrease of 12.5 percent; surface-active agents (3,085 million kilograms) decreased 7.0 percent; cyclic intermediates (24,756 million kilograms) decreased 6.6 percent; plasticizers (976 million kilograms) decreased 6.4 percent; plastics and resin materials (26,995 million kilograms) decreased 6.3 percent; elastomers (synthetic rubber) (2,091 million kilograms) decreased 6.0 percent; and organic pigments (50 million kilograms) decreased 4.2 percent in 1989 from that in 1988.

Table 1
Synthetic organic chemicals and their raw materials: U.S. production and sales, 1988 and 1989

Chemical	Production			Sales					
				Quantity			Value		
	1988	1989	Increase or decrease (-), 1989 over 1988 ¹	1988	1989	Increase or decrease (-), 1989 over 1988 ¹	1988	1989	Increase or decrease (-), 1989 over 1988 ¹
	Million kilograms	Million kilograms	Percent	Million kilograms	Million kilograms	Percent	Million dollars	Million dollars	Percent
Grand total	175,841	172,977	-1.6	98,197	98,382	0.2	93,406	96,071	2.9
Coal tar	894	857	-4.1	(²)	(²)	(²)	(²)	(²)	(²)
Primary products from petroleum and natural gas	51,003	50,742	-0.5	26,669	27,834	4.4	10,517	11,369	8.1
Synthetic organic chemicals, total ³	123,944	121,378	-2.1	71,528	70,548	-1.4	82,889	84,702	2.2
Cyclic intermediates	26,492	24,756	-6.6	12,016	12,371	3.0	9,369	10,284	9.8
Dyes	127	174	37.1	114	146	28.1	766	858	11.9
Organic pigments	53	50	-4.2	39	43	9.7	595	702	18.0
Medicinal chemicals	117	130	11.3	103	204	97.0	1,831	1,988	8.5
Flavor and perfume materials	74	64	-12.5	43	38	-10.8	866	1,005	16.1
Plastics and resin materials	28,820	26,995	-6.3	25,057	23,819	-4.9	33,831	32,180	-4.9
Rubber-processing chemicals	160	176	9.9	121	129	6.9	424	473	11.6
Elastomer (synthetic rubber)	2,226	2,091	-6.0	1,467	1,395	-4.9	2,982	2,872	-3.7
Plasticizers	1,043	976	-6.4	850	837	-1.6	1,001	1,046	4.4
Surface-active agents	3,319	3,085	-7.0	1,933	1,724	-10.8	2,303	2,086	-9.4
Pesticides and related products	528	572	8.4	424	461	8.7	4,354	5,203	19.5
Miscellaneous end-use chemicals and chemical products	12,940	13,503	4.3	10,214	9,278	-9.2	9,449	9,759	3.3
Miscellaneous cyclic and acyclic chemicals	48,046	48,804	1.6	19,147	20,103	5.0	15,118	16,247	7.5

¹ Percentage calculated from figures rounded to thousands.

² Not available.

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

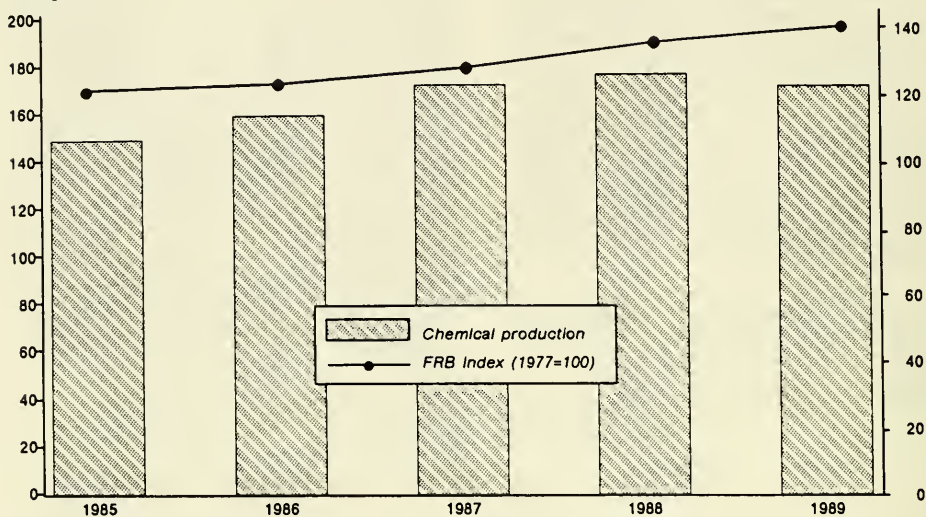
Note.—Data for 1988 and 1989 do not include ethane, propane, and butane production.

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

Summary

Figure 1-1
Synthetic organic chemicals and their raw materials, total production, vs FRB Industrial production Index

Billions
of kilograms



Source: Production, U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales*; FRB Industrial Production Index, The Board of Governors of the Federal Reserve System.

General

In this report, synthetic organic chemicals are classified on the basis of their principal use as follows: Cyclic intermediates, dyes, organic pigments, medicinal chemicals, flavor and perfume materials, plastics and resin materials, rubber-processing chemicals, elastomers (synthetic rubber), plasticizers, surface-active agents, pesticides and related products, miscellaneous end-use chemicals and chemical products, and miscellaneous cyclic and acyclic chemicals. Most of these groups are further subdivided either by use or by chemical composition. As intermediates, chemicals are used in the manufacture of finished products, aggregate figures that cover both intermediates and finished products necessarily include considerable duplication.

Total production of synthetic organic chemicals (intermediates and finished products combined) in 1989 was 121,378 million kilograms, or 2.1 percent less than the output of 123,944 million kilograms reported for 1988, and 53.4 percent more than the output of 79,144 million kilograms reported in 1977 (see table 2).

Sales of synthetic organic chemicals in 1989 amounted to 70,548 million kilograms, valued at \$84,702 million, compared with 71,528 million kilograms, valued at \$82,889 million, in 1988, and 44,378 million kilograms, valued at \$32,434 million, in 1977. Production of all cyclic (ring chemical structure) products (intermediates and finished products combined) in 1989 totaled 38,895 million kilograms, or 5.2 percent less than the 41,031 million kilograms reported for 1988, and 122.9 percent more than the 17,451 million kilograms reported for 1977; however, the transfer of eight items, in 1979, from the primary products from petroleum and natural gas section to the section on cyclic intermediates has caused the output of cyclic products to appear much higher in relation to 1977 than would otherwise have resulted. Production of all acyclic (linear or branch chemical structure) products in 1989 totaled 80,392 million kilograms, or 0.4 percent less than the 80,688 million kilograms reported for 1988, and 36.1 percent more than the 59,057 million kilograms reported for 1977. Differences in trends between cyclic and acyclic products reflect the aggregation of changes in usage of individual chemicals rather than preferences for cyclic versus acyclic chemicals.

Table 2

Synthetic organic chemicals: Summary of U.S. production and sales of intermediates and finished products, 1977, 1988, and 1989

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

Chemicals	1977 ¹	1988	1989	Increase or decrease (-)	
				1989 over 1977	1989 over 1988
Organic chemicals, cyclic and acyclic, total:					
Production	79,144,460	123,944,362	121,378,075	53.4	-2.1
Sales	44,378,105	71,528,398	70,548,189	59.0	-1.4
Sales value	32,434,301	82,888,676	84,702,188	161.2	2.2
Cyclic, total:2					
Production	17,451,083	41,030,608	38,895,104	122.9	-5.2
Sales	10,833,542	23,550,694	23,577,601	117.6	0.1
Sales value	13,410,029	35,676,925	38,189,601	184.8	7.0
Acyclic, total:2					
Production	59,056,510	80,888,148	80,391,891	36.1	-0.4
Sales	31,649,694	46,510,559	45,575,686	44.0	-2.0
Sales value	17,084,012	44,229,621	43,640,346	155.4	-1.3
1. Cyclic Intermediates					
Production	6,493,888	26,492,181	24,755,837	191.5	-6.6
Sales	3,622,331	12,016,015	12,370,861	241.5	3.0
Sales value	2,596,627	9,369,068	10,283,993	296.1	9.8
2. Dyes					
Production	119,917	127,183	174,358	45.4	37.1
Sales	115,448	113,779	145,757	26.3	28.1
Sales value	689,992	766,148	857,554	24.3	11.9
3. Organic Pigments					
Production	31,165	52,570	50,360	61.6	-4.2
Sales	26,052	39,406	43,236	66.0	9.7
Sales value	267,747	594,657	701,552	162.0	18.0

See footnotes at end of table.

Table 2—Continued

Synthetic organic chemicals: Summary of U.S. production and sales of intermediates and finished products, 1977, 1988, and 1989

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

Chemicals	1977 ¹	1988	1989	Increase or decrease (-)	
				1989 over 1977	1989 over 1988
4. Medicinal Chemicals					
Cyclic:					
Production	69,819	72,140	95,672	37.0	32.6
Sales	37,914	50,295	153,166	304.0	204.5
Sales value	718,392	1,622,980	1,782,033	148.1	9.8
Acyclic:					
Production	39,377	44,979	34,654	-12.0	-23.0
Sales	35,743	53,079	50,447	41.1	-5.0
Sales value	75,626	208,031	205,486	171.7	-1.2
5. Flavors and Perfume Materials					
Cyclic:					
Production	26,514	35,552	38,097	43.7	7.2
Sales	21,232	25,882	27,502	29.5	6.3
Sales value	134,628	704,353	908,457	574.8	29.0
Acyclic:					
Production	41,715	37,970	26,227	-37.1	-30.9
Sales	27,559	17,200	10,918	-60.4	-36.5
Sales value	72,473	161,742	96,786	33.5	-40.2
6. Plastics and Resin Materials					
Cyclic:					
Production	4,899,932	8,559,482	8,017,658	63.6	-6.3
Sales	4,284,062	7,316,588	6,955,265	62.4	-4.9
Sales value	4,275,111	13,795,504	13,065,234	205.6	-4.9
Acyclic:					
Production	10,804,977	20,260,322	18,977,823	75.6	-6.3
Sales	9,232,677	17,740,220	16,864,135	82.7	-4.9
Sales value	6,606,712	20,095,787	19,115,146	189.3	-4.9
7. Rubber-Processing Chemicals					
Cyclic:					
Production	152,204	144,462	155,035	1.9	7.3
Sales	91,740	107,185	108,721	18.5	1.4
Sales value	248,756	397,388	429,565	72.7	8.1
Acyclic:					
Production	21,076	15,535	20,830	-1.2	34.1
Sales	16,254	13,322	20,125	23.8	51.1
Sales value	29,009	26,525	43,327	49.4	63.3
8. Elastomers (Synthetic Rubber)					
Production	2,636,867	2,225,606	2,091,080	-20.7	-6.0
Sales	1,894,869	1,467,145	1,394,902	-26.4	-4.9
Sales value	1,940,260	2,982,130	2,872,241	48.0	-3.7
9. Plasticizers					
Cyclic:					
Production	638,249	804,954	734,653	15.1	-8.7
Sales	630,645	653,102	634,202	0.6	-2.9
Sales value	474,781	700,084	703,942	48.3	0.6
Acyclic:					
Production	174,615	238,508	241,738	38.1	1.4
Sales	125,784	196,753	202,387	60.9	2.9
Sales value	157,549	301,219	341,585	116.8	13.4
10. Surface-Active Agents					
Cyclic:3					
Production	448,863	1,375,479	1,347,168	(4)	-2.1
Sales	212,933	1,035,108	911,195	(4)	-12.0
Sales value	200,244	1,000,033	743,088	(4)	-25.7
Acyclic:					
Production	1,691,285	1,943,071	1,738,206	(4)	-10.5
Sales	927,674	897,769	812,840	(4)	-9.5
Sales value	674,778	1,303,218	1,342,759	(4)	3.0
11. Pesticides and Related Products					
Cyclic:					
Production	376,276	344,599	365,900	-2.8	6.2
Sales	313,520	259,530	286,745	-8.5	10.5
Sales value	1,664,008	3,054,331	3,639,436	118.7	19.2
Acyclic:					
Production	253,099	183,312	206,486	-18.4	12.6
Sales	259,376	164,662	174,427	-32.8	5.9
Sales value	1,144,265	1,299,407	1,563,346	36.6	20.3

See footnotes at end of table.

Table 2—Continued

Synthetic organic chemicals: Summary of U.S. production and sales of intermediates and finished products, 1977, 1988, and 1989

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

Chemicals	1977 ¹	1988	1989	Increase or decrease (-)	
				1989 over 1977	1989 over 1988
12. Miscellaneous End-Use Chemicals and Chemical Product					
Cyclic:					
Production	1,252,527	1,537,478	1,592,471	27.1	3.6
Sales	1,004,105	1,243,629	1,205,851	20.1	-3.0
Sales value	1,479,800	1,984,420	3,606,757	143.7	81.8
Acyclic:					
Production	7,523,638	11,402,681	11,910,252	58.3	4.5
Sales	3,919,801	8,970,501	8,072,193	105.9	-10.0
Sales value	1,067,681	7,464,116	6,152,720	476.3	-17.6
13. Miscellaneous Cyclic and Acyclic Chemicals					
Cyclic:					
Production	941,729	1,484,528	1,567,895	66.5	5.6
Sales	473,560	690,175	735,100	55.2	6.5
Sales value	659,943	1,747,959	1,467,990	122.4	-16.0
Acyclic:					
Production	38,506,728	46,561,770	47,235,675	22.7	1.4
Sales	17,104,826	18,457,053	19,368,214	13.2	4.9
Sales value	7,255,919	13,369,576	14,779,191	103.7	10.5

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 1977 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 1989 of one or more of the chemicals included in each group.

Chemical group	Number of companies	Chemical group	Number of companies
Cyclic intermediates	168	Elastomers (synthetic rubber)	31
Dyes	34	Plasticizers	43
Organic pigments	34	Surface-active agents	156
Medicinal chemicals	87	Pesticides and related products	67
Flavor and perfume materials	30	Miscellaneous end-use chemicals and	
Plastics and resins materials	254	chemicals products	161
Rubber-processing chemicals	23	Miscellaneous cyclic and acyclic	
		chemicals	249

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. Production of coal tar, therefore, depends on the demand for steel. 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 1989, U.S. production of crude coal tar was 590 million liters. Production of crude light oil was 268 million liters in 1989.

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 1-1.

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 1-1 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.

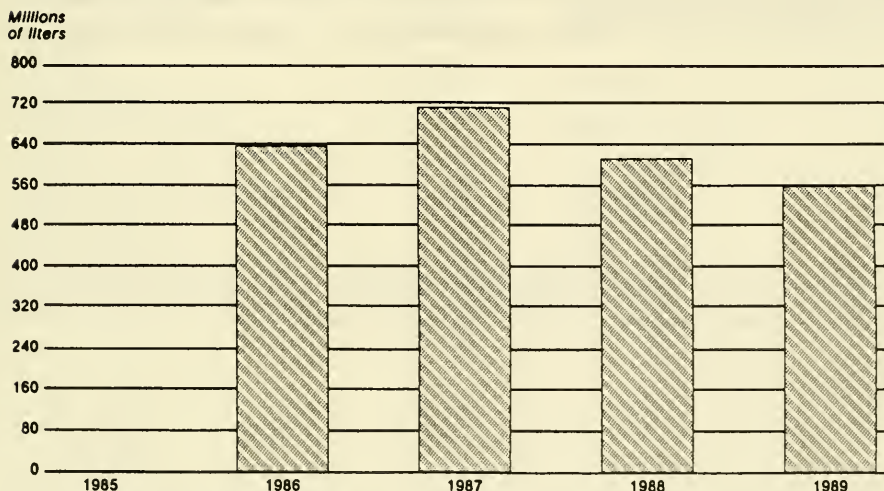
Table 1-2 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 1-3.

Data for 1989 tar crudes were supplied by 26 companies and company divisions.

Cynthia B. Foreso
202-252-1348

(Effective 1/14/91 202-205-3348)

Figure 1-1
Crude Coal tar: U.S. production, 1985-89



Note.—Data for 1985 are not available.

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

Table 1-1

Coal tar, tar crudes, and pitches: U.S. production and sales, 1989

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 liters	589,669	657,391	47,965	\$0.07
Crude light oil: (coke-oven operators)	1,000 liters	267,908	264,259	43,282	.16
Light-oil distillates:					
Benzene, all grades, total ²	1,000 liters	(³)	(³)	(³)	(³)
Coke-oven operators	1,000 liters	(³)	(³)	(³)	(³)
Petroleum refiners	1,000 liters	6,159,354	3,987,436	1,360,245	.34
Toluene, all grades, total ²	1,000 liters	(³)	(³)	(³)	(³)
Coke-oven operator	1,000 liters	(³)	(³)	(³)	(³)
Petroleum refiners	1,000 liters	3,039,346	2,034,914	548,599	.27
Xylene, all grades, total ²	1,000 liters	(³)	(³)	(³)	(³)
Coke-oven operators	1,000 liters	(³)	(³)	(³)	(³)
Petroleum refiners	1,000 liters	3,227,742	1,556,757	506,042	.33
Other tar distillates	1,000 liters	278,713	255,312	35,650	.14
Creosote oil (Dead oil) (100 percent creosote basis):					
Distillate as such (100 percent creosote basis)	1,000 liters	206,672	138,231	21,787	.16
Creosote in coal tar solution (100 percent solution basis)	1,000 liters	72,041	117,081	13,863	.12
Tar and tar pitches:					
Refined tar for uses other than road tar	1,000 liters	35,271	(³)	(³)	(³)
Pitch of tar:					
Hard	1,000 metric ton	645	487	121,246	248.90

¹ Unit value per liter or metric 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.

Note.—Statistics for materials produced in tar and petroleum refineries are compiled by the U.S. International Trade Commission. Data for all other tars and tar crudes are not included in the 1989 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 1-2

Coal tar, tar crudes and pitches for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Coal tar, tar crudes and pitches	Separate statistics ¹	Manufacturers' identification codes (according to list in table 1-3)
Light oil, light oil distillates, and tar bases:		
Crude coal tar	Yes	ABP, ALS, ART, CGU, DTR, EKO, GSS, ILI, INL, LTV, NBC, NTS, SGO, TWD, WPS.
Crude light oil	Yes	ABP, ALS, ART, BTS, CGU, EKO, GSS, ILI, INL, KPT, LTV, NBC, NTS, SGO, TWD, USX, WPS.
Pyridine, tar bases:		
Benzene (benzol):		
Tar bases: crude bases (dry basis)	No	CPY, KPT, USX.
Toluene (toluol):		
Toluene (Toluol) other grades	No	KPT.
All other:		
All other light-oil distillates	No	LYP, NTS.
Other tar distillates:		
Naphthalene, crude:		
Methylnaphthalene	No	KPT.
Naphthalene, crude, solidifying at less than 74° C ..	No	BTS, COP, CPY, 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	No	ACS, ASY, INL, KPT, 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	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.
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, COP, KPT, RIL.
Pitch of tar: medium (M.P. 110° To 160° F)	No	ART, 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.

Table 1-3

Coal tar, tar crudes and pitches: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABP	Drummond Co. Inc.	ILI	Acme Steel Corp.
ACS	Allied Signal, Inc., Engineered Materials Sector	INL	Inland Steel Co.
ALS	Armco, Inc.	KPT	Kopper Industries
ART	Arlotech Chemical Corp.	LTV	LTV Steel Co.
ASY	American Synthetic Rubber Corp.	LYP	Lyondell Petrochemical Co.
BTS	Bethlehem Steel Corp.	NBC	New Boston Coke Corp.
CGU	Citizen Gas And Coke Utility	NTS	National Steel Corp., Great Lakes Div.
COP	Coopers Creek Chemical Corp.	RIL	Relly Industries, Inc.
CPY	Copolymer Rubber and Chemical Corp.	SGO	Shenango, Inc.
DTR	Detroit Coke Corp.	TWD	Tonawanda Coke Corp.
EKO	Empire Coke Co.	USX	U.S. Steel, Div. of USX Chemical Div.
GIV	Givaudan Corp.		Gary Works
GSS	Gulf States Steel	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 to 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

1985-89 is shown in figure 2-1. Beginning in 1988, production and sales data no longer are collected for ethane, propane, and butane. Total production for primary products during 1989 amounted to 50,742 million kilograms.

The output of aromatic and naphthenic products from petroleum amounted to 12,628 million kilograms in 1989, compared with 13,254 million kilograms in 1988. Sales amounted to \$2,635 million in 1989 and \$2,254 million in 1988. In 1989, production of benzene was 5,414 million kilograms; production of toluene was 2,635 million kilograms; and production of mixed xylenes was 2,948 million kilograms (table 2-1).

Production of all aliphatic hydrocarbons and derivatives from petroleum and natural gas was 38,113 million kilograms in 1989. Sales of these products were valued at \$8,734 million. Production of ethylene was 15,871 million kilograms in 1989. The output of 1,3-butadiene was 1,416 million kilograms and propylene production was 9,331 million kilograms during 1989 (table 2-1).

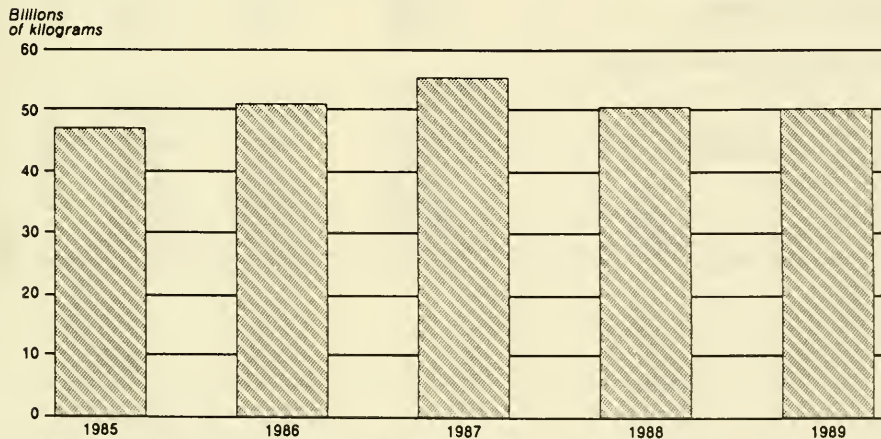
Table 2-2 lists the products reported in this section and indicates the manufacturer(s) of each by code. The codes are identified by company name in table 2-3.

Data for 1989 primary products from petroleum and natural gas for chemical conversion were supplied by 61 companies or company divisions.

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¹ Statistics on chemicals from coal tar are given in Section 1 (Coal tar, tar crudes, and pitches) of this report.

Figure 2-1
Primary products from petroleum and natural gas for chemical conversion U.S. production, 1985-89



Note.—Data for 1988 and 1989 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 2-1

Primary products from petroleum and natural gas for chemical conversion:
U.S. production and sales, 1989

Primary products from petroleum and natural gas for chemical conversion	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	50,741,619	27,834,154	11,369,191	\$0.41
Aromatics and naphthenes²				
Total	12,628,256	7,658,278	2,635,111	.34
Benzene, all grades	5,414,072	3,504,956	1,360,245	.39
Toluene, all grades ^{3,4}	2,634,809	1,764,067	548,599	.31
Xylenes, mixed	2,947,574	1,421,631	506,042	.36
All other aromatics and naphthenes ⁵	1,631,801	967,624	220,225	.23
Aliphatic hydrocarbons				
Total	38,113,363	20,175,876	8,734,080	.43
C₂ Hydrocarbons, total⁶	15,926,316	(?)	(?)	(?)
Acetylene ⁶ (For chemical use only)	55,814	(?)	(?)	(?)
Ethylene	15,870,502	7,622,374	3,991,876	.52
C₃ Hydrocarbons, total⁶	9,331,186	5,269,185	2,109,565	.40
Propylene ¹⁰	9,331,186	5,269,185	2,109,565	.40
C₄ Hydrocarbons, total¹¹	5,316,981	3,162,813	1,046,936	.33
Butadiene and butylene fractions	853,516	594,631	132,168	.22
1,3-Butadiene, grade for rubber (elastomers)	1,415,751	1,370,278	592,991	.43
1-Butene	255,479	134,614	71,761	.53
Isobutane	383,307	319,572	55,766	.17
Isobutylene	541,173	121,938	64,046	.53
All other C ₄ hydrocarbons ¹²	1,867,755	621,780	130,204	.21
C₅ Hydrocarbons, total	1,483,464	870,792	230,307	.26
Isoprene (2-Methyl-1,3-butadiene)	158,027	97,439	40,090	.41
n-Pentane	430,008	(?)	(?)	(?)
Piperylene (1,3-Pentadiene)	50,928	55,301	18,382	.33
All other C ₅ hydrocarbons ^{13,14}	844,501	718,052	171,835	.24
All other aliphatic hydrocarbons, derivatives, and mixtures, total	6,055,416	3,250,712	1,355,396	.42
Alpha olefins, C ₆ -C ₁₀	345,073	(?)	(?)	(?)
Alpha olefins, C ₁₁ and higher	346,764	184,406	183,334	.99
Dodecene (Tetrapropylene)	156,641	144,154	66,417	.46
n-Heptane	62,419	64,039	28,346	.44
Nonene (Tripropylene)	291,600	161,384	76,928	.48
n-Paraffins ¹⁶	927,142	588,039	219,974	.37
All other ¹⁶	3,925,777	2,108,690	780,397	.37

See footnotes at end of table.

Table 2-1—Continued

Primary products from petroleum and natural gas for chemical conversion:
U.S. production and sales, 1989

-
- 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 1-1 of the report on "Coal tar, tar crudes and pitches."
- ³ Includes toluene, solvent grade, 90 percent.
- ⁴ Includes toluene and xylene used as solvents; may include that which is blended in aviation and motor gasolines.
- ⁵ Includes data for alkyl aromatics, crude cresylic acid, cyclopentane, naphthalene, naphthenic acid, carbon black feedstock, distillates, solvents and miscellaneous cyclic hydrocarbons.
- ⁶ Ethane production and sales data are no longer collected.
- ⁷ Reported data are accepted in confidence and may not be published, or no data were reported.
- 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, 2-pentene, and mixed pentenes.
- ¹⁴ Includes sales data only for n-pentane.
- ¹⁵ Includes data for the following chain lengths: C₈-C₉, C₉-C₁₀, C₁₀-C₁₄, C₁₀-C₁₆, C₁₂-C₁₈ and others.
- ¹⁶ Includes production and/or sales data for acetylene, alpha olefins (C₆-C₁₀), methane, hexane, isoheptanes, isoheptane, iso-octane, neohexane, methylcyclopentadiene, mixed hexenes, mixed heptenes, mixed octenes, n-octane, di-isobutylene, elcosane, mixtures of C₂ and C₃, C₆-C₈, 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.

Table 2-2

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Primary products from petroleum and natural gas for chemical conversion	Separate statistics ¹	Manufacturers' identification codes (according to list in table 2-3)
Aromatics and naphthenes:		
Alkyl aromatics:		
Cyclosols	No	CXI.
All other alkyl aromatics:	No	SHC.
Benzene:		
Benzene High purity (98-100%)	No	AMO, ASH, CNE, CSD, DOW, ENJ, GRS, HES, KHI, LYP, MOC, PLC, PPR, SHC, SIO, SM, SOC, SOG, SUN, SWR, TX, UOC, USI.
All other benzenes	No	AMO, ATR, HCL, KLM, UTP, 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 less than 150	No	HEC, SHC.
Toluene:		
Toluene High purity (98-100%)	No	ASH, CNE, CSD, ENJ, GRS, HES, KHI, LYP, MOC, PLC, PPR, PPX, SC, SHC, SIO, SM, SOG, SUN, SWR, TX, UOC, LYP, SOC.
All other toluenes	No	
Xylenes, mixed:		
Xylene High purity (98-100%)	No	AMO, ASH, CSD, CSP, ENJ, HES, LYP, PLC, PPR, SHC, SOG, SUN, SWR, UOC.
All other xylenes	No	AMO, MOC.
All other aromatics and naphthenes:		
Aromatics, C ₉	No	ENJ, MOC.
Benzene, toluene, xylene, mixtures	No	ELP.
Carbon black feedstock	No	ENJ.
All other products from petroleum and natural gas, cyclic	No	AMO, ATR, BAS, BFG, EKX, ELP, ENJ, LYP, OMC, SHC, TX, UCC, UPM, VST.
Aliphatic hydrocarbons:		
C ₁ Hydrocarbons:		
Methane	No	SHO.
C ₂ Hydrocarbons:		
Acetylene (For chemical use only)	Yes	KHI, RH, UCC.
Ethylene	Yes	AMO, BAS, BFG, CNE, DOW, DUP, EKX, ELP, ENJ, GE, LYP, OMC, PLC, SHC, SM, SOC, SUN, TX, UCC, USI, UTP, VST.
C ₃ Hydrocarbons:		
Hydrocarbons, C ₂ -C ₃ mixtures	No	CGO, SIO.
Propylene	Yes	AMO, ASH, BAS, BFG, CCP, CGO, CNE, CSD, DA, DOW, DUP, EKX, ELP, ENJ, GE, KHI, LYP, MOC, PLC, PPS, SHC, SM, SOC, SOG, SUN, TX, UCC, USI, UTP, VLR, VST.
C ₄ Hydrocarbons:		
Butadiene and butylene fractions	Yes	BAS, CNE, DA, DOW, EKX, ELP, GE, PLC, SOC, TX, UCC, USI, UTP, VST.
1,3-Butadiene, grade for rubber (Elastomers)	Yes	AMO, CNE, 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	ATR, DOW, LYP, SHC, TNA.
Hydrocarbons, C ₄ fraction	No	KHI, TX.
Hydrocarbons, C ₄ mixtures	No	LYP, PPR, SOG.
Isobutane (2-Methylpropane)	Yes	AMO, ATR, CSP, DA, MOC, PLC, SHO, SUN, TX.
Isobutylene (2-Methylpropene)	Yes	AMO, ATR, ENJ, SHC, TPC, TX.
All other C ₄ hydrocarbons	No	ENJ, SM, TX.

See footnotes at end of table.

Table 2-2—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Primary products from petroleum and natural gas for chemical conversion	Separate statistics ¹	Manufacturers' identification codes (according to list in table 2-3)
---	----------------------------------	--

Aliphatic hydrocarbons—Continued

C₆ Hydrocarbons:

Hydrocarbons, C ₆ mixtures	No	CNE, GYR, LYP.
Isoamylene	No	ENJ.
Isopentane (2-Methylbutane)	No	PLC, SHO.
Isoprene (2-Methyl-1,3-butadiene)	Yes	DOW, ENJ, GYR, LYP, SOC.
n-Pentane	Yes	CSP, KHI, PLC, SHO.
2-Pentene	No	BFG, DOW.
Pentenes, mixed	No	CSP, CXI, PLC, SHO, TX.
Piperylene (1,3-Pentadiene)	Yes	CXI, DOW, LYP.
All other C ₆ hydrocarbons	No	ENJ, SHC, TX.

All other aliphatic hydrocarbons, derivatives, and mixtures:

C₆ Hydrocarbons:

Hexane	No	ENJ, PLC, SOG, TX, UOC.
1-Hexene	No	PLC.
Hexenes, mixed	No	ENJ.
Hydrocarbons, C ₆ -C ₈ mixtures	No	PLC.
Isohexane	No	PLC.
Methylcyclopentadiene	No	ENJ.
Neohexane (2,2-Dimethylbutane)	No	PLC.
All other C ₆ hydrocarbons	No	DA, PLC, SHC, SM, TX.

C₇ Hydrocarbons:

n-Heptane	Yes	ENJ, PLC, SOG, TX, UOC.
Heptenes, mixed	No	ENJ, TX.
Isoheptanes	No	PLC.
All other C ₇ hydrocarbons	No	EKX, PPR, SHC.

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.

C₉ and above Hydrocarbons (except alpha olefins):

Dodecene	Yes	CSP, ENJ, SOC, SUN.
Nonene (Tripropylene)	Yes	ATR, CSP, ENJ, SOC, TX.

Alpha olefins:

Alpha olefins, C ₉ -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	SHC, UOC.
n-Paraffins, C ₁₀ -C ₁₈	No	ENJ, VST.
n-Paraffins, C ₁₂ -C ₁₈	No	VST.
n-Paraffins, C ₈ -C ₉	No	SOG, UOC.
n-Paraffins, C ₈ -C ₁₆	No	SOG, TX, 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.
Decyl mercaptans	No	PAS.
Di-tert-butyl disulfide	No	PLC.
Diethyl sulfide (Ethyl sulfide)	No	HAP, PAS.
Dimethyl sulfide	No	GAY, 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.
Methyl mercaptan (Methanethiol)	No	PAS.
Octyl mercaptans	No	PAS.
n-Propyl mercaptan (1-Propanethiol)	No	PAS, PLC.

See footnotes at end of table.

Table 2-2—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1989

<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 2-3)</i>
Allphatic hydrocarbons—Continued		
Hydrocarbon derivatives—Continued		
Thlophane (Tetrahydrothlophene)	No	HAP.
All other hydrocarbon derivatives	No	PAS, PLC, SHC.
All other hydrocarbons C ₆ and above, including mixtures	No	ENJ, 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 2-3

Primary products from petroleum and natural gas for chemical conversion: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
AMO	Amoco Corp.	HKO	Occidental Chemical Corp., Olefins Div.
ASH	Ashland Oil, Inc., Ashland Petroleum Co.	KHI	Koch Refining Co.
ATR	Atlantic Richfield Co., Arco Chemical Co.	KLM	Kalama Chemical, Inc.
BAS	BASF Corp.	LYP	Lyondell Petrochemical Co.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group	MER	Merichem Co.
CCP	Crown Central Petroleum Corp.	MOC	Marathon Petroleum Co., Texas Refining Div.
CED	Cedar Chemical Co.	OMC	Olin Corp.
CGO	Citgo Petroleum Corp.	PAS	Atochem North America, Inc.
CNE	Oxy Petrochemicals, Inc.	PLC	Phillips 66 Co.
CPS	CPS Chemical Co., Inc.	PPR	Phillips Puerto Rico Corp., Inc.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.	PPS	EPC Partners, LTD
CSP	Coastal Refining & Marketing, Inc.	PPX	Phillips Paraxylene, Inc.
CXI	Chemical Exchange Industries, Inc.	PSG	PMC, Inc., Specialties Group, Inc.
DA	Diamond Shamrock Refining & Marketing	RH	Rohm & Haas Co.
DOW	Dow Chemical Co.	SC	Sterling Chemicals, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Eastman Kodak Co.:	SHC	Shell Chemical Co.
EKT	Tennessee Eastman Co. Div.	SHO	Shell Oil Co.
EKX	Texas Eastman Co. Div.	SIO	BP Oil Company
ELP	Rexene Products Company	SM	Mobil Oil Corp.:
ENJ	Exxon Chemical Americas		Gas Liquids Dept.
EPC	EPC Partners, Ltd.		Petrochemicals Div.
GAY	Gaylord Chemical Corp.	SOC	Chevron Corp., Chevron Chemical Co.
GE	General Electric, Specialty Chemical Group	SOG	Hill Petroleum Co.
GRS	Champlin Refining Co.	SUN	Sun Company, Inc.
GYR	Goodyear Tire & Rubber Co.	SWR	Southwestern Refining Co., Inc.
HAP	Helmerich & Payne Inc., Natural Gas Odorizing, Inc.	TNA	Ethyl Corp.
HCL	Hoechst Celanese Corp., Bayport Works, SP & W Div.	TPC	Texas Petrochemicals Corp.
HEC	Hewchem	TX	Texaco Chemical Co.
HES	Amerada Hess Corp. (Hess Oil Virgin Islands Corp)	UCC	Union Carbide Corp., Industrial Chemical Div.
		UOC	Union Oil Co. of California
		UPM	UOP, Inc.
		USI	Quatum Chemical Corp., USI Div.
		UTP	Union Texas Product Corp.
		VLR	Valero Refining Co. & Marketing 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, ethylbenzene is used as a raw material in the manufacture of styrene. In 1989, about 50 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 1985-89 is shown in figure 3-1. Total production of cyclic intermediates in 1989 amounted to 24,756 million kilograms, a decrease of 7 percent compared with production reported to the Commission in 1988. Reported

sales of cyclic intermediate chemicals in 1989 were 12,371 million kilograms, valued at \$10,284 million, compared with 12,016 million kilograms, valued at \$9,369 million, in 1988.

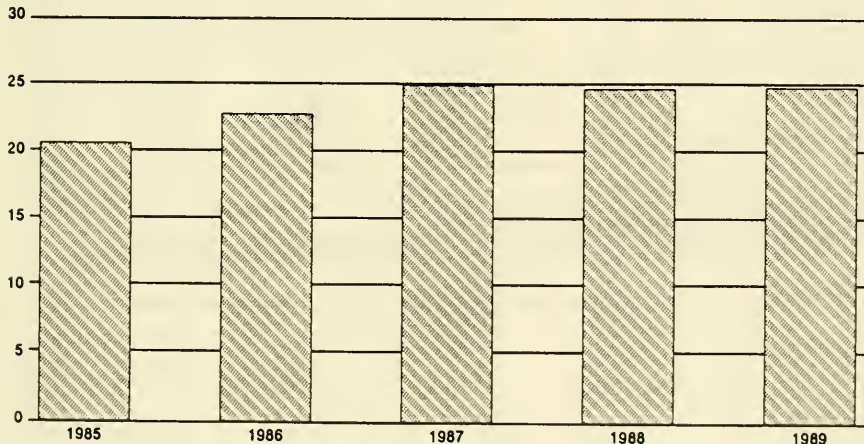
Intermediates that were produced in excess of 500 million kilograms in 1989 were ethylbenzene (4,189 million kilograms), terephthalic acid and terephthalic acid dimethyl ester (3,822 million kilograms), styrene (3,782 million kilograms), p-xylene (2,424 million kilograms), cumene (2,008 million kilograms), phenol (1,726 million kilograms), cyclohexane (1,031 million kilograms), and bisphenol A (563 million kilograms). These intermediate chemicals produced in excess of 1 billion kilograms accounted for about 79 percent of the total output of cyclic intermediate chemicals produced in 1989.

Table 3-2 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 3-3.

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Figure 3-1
Cyclic Intermediates: U.S. production, 1985-89

Billions
of kilograms



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

Table 3-1

Cyclic Intermediates: U.S. production and sales, 1989

Cyclic intermediates	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	24,755,837	12,370,861	10,283,993	\$0.83
o-Acetoacetanilide	718	677	5,833	8.62
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-1-o-anisidine sulfonic acid)	1,068	(²)	(²)	(²)
Aniline (Aniline oil)	460,998	316,383	215,867	.68
Anilinoethanesulfonic acid and salt	92	(²)	(²)	(²)
Benzoic acid, tech	47,332	(²)	(²)	(²)
Biphenyl	19,775	10,196	6,697	.66
Chlorobenzene, mono-	133,741	(²)	(²)	(²)
Cresols and cresylic acid ³	34,412	29,904	49,332	1.65
Cumene	2,007,702	1,271,899	601,429	.47
Cyclohexane	1,031,211	1,048,405	489,448	.47
Cyclohexanone	483,277	56,673	64,323	1.13
Dicyclopentadiene (including cyclopentadiene)	54,867	62,146	21,720	.35
Ethylbenzene	4,189,377	145,353	80,533	.55
Isocyanic acid derivatives, total	774,332	571,117	962,373	1.69
Diphenylmethane-4,4'-diisocyanate (MDI)	158,428	(²)	(²)	(²)
Polymethylene polyphenylisocyanate	277,523	205,806	393,154	1.91
Toluene-2,4- and 2,6-diisocyanate (80/20 mixture)	332,443	281,615	459,347	1.63
All other isocyanic acid derivatives	5,938	83,696	109,872	1.31
4,4'-Isopropylidenediphenol (Bisphenol A)	563,074	180,965	221,658	1.22
Nonylphenol	74,702	38,841	46,218	1.19
Octylphenol	14,248	(²)	(²)	(²)
Phenol, total	1,726,417	654,045	619,665	.95
From cumene	1,406,030	528,584	494,091	.93
All other phenol	320,387	125,461	125,574	1.00
Phthalic anhydride	416,125	195,880	130,786	.67
Salicylic acid, tech	11,691	(²)	(²)	(²)
Styrene	3,781,561	1,965,840	1,411,501	.72
Terephthalic acid, dimethyl ester ⁴	3,821,973	(²)	(²)	(²)
Tetrahydrofuran	78,275	33,751	64,064	1.90
o-Xylene	445,915	238,607	102,563	.43
p-Xylene	2,424,231	1,401,609	870,823	.62
All other cyclic intermediates	2,158,723	4,148,570	4,319,160	1.04

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 3-2

Cyclic intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic		
Acetoacetanilide	No	BRD, EKT.
o-Acetoacetanilide	Yes	BRD, EKT, LC.
o-Acetoacetotoluidide	No	BRD, EKT.
2',4'-Acetoacetoxyllide	No	EKT.
Acetoacet-m-xylidide	No	BRD.
Acetoguanamine	No	DIX.
Acetophenone, tech	No	S, TLI.
p-Acetotoluidide	No	EK.
2-Acetylpyridine	No	RIL.
Aldadene	No	SRL.
Alkylbenzenes:		
Alkylbenzene straight-chain (except dodecyl and tridecyl)	No	MON, PLC.
Dodecylbenzene (including tridecylbenzene):		
Dodecylbenzene, straight-chain	No	MON, VST.
All other dodecylbenzene (including tridecylbenzene)	No	MON.
Alkylphenols, mixed	No	PSG, SCN.
Alkylpyridines, mixed	No	RIL, (2).
Aluminum chlorohydroxyphthalocyanine blue	No	PHC.
4'-Aminoacetanilide (Acetyl-p-phenylenediamine)	No	HCL.
3'-Amino-p-acetanilide	No	BUC, SDC.
1-Aminoanthraquinone and salt	No	SDC.
p-Aminobenzamide	No	NSC.
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-p-toluenesulfonic acid [SO ₂ H=1]	No	LMC.
5-Amino-5-chloro-m-toluenesulfonic acid [SO ₂ H=1] (2B Acid)	No	DUP, PHC.
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.
2-Amino-2-methylpropyl-8-bromothephyllinate	No	CHT.
2-Amino-5-methylpyridine	No	RIL.
2-Amino-6-methylpyridine	No	RIL.
3-Amino-2,7-naphthalenedisulfonic acid	No	NES.
2-Amino-5-nitrothiazole	No	PCW, SAL.
2-Amino-4-nitrotoluene hydrochloride	No	PCW.
5-Amino-2-[(2-oxo-5-benzimidazolyl)amino]-benzenesulfonic acid	No	BRS, PFZ.
6-Aminopenicillanic acid	No	BEE.
p-Aminophenol	No	MAL.
p-[(p-Aminophenyl)azo]benzenesulfonic acid	No	ATL, VPC.
7-[(4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	No	ACY.
3-Aminophenylphosphonic acid	No	ICI.
2-Aminopyridine	No	RIL.
4-Aminopyridine	No	RIL.
5-Aminosallylic acid	No	SAL.
2-Aminothiazole nitrate	No	PCW.
4-Amino-m-toluenesulfonic acid [SO ₂ H=1]	No	DUP.
6-Amino-m-toluenesulfonic acid [SO ₂ H=1]	No	DUP, PHC.
Aniline (Aniline oil)	Yes	ART, DUP, FST, ICI, MAL, MOB, RUC, USR.
2-Anilinoethanol	No	SCP.
Anilinoethanesulfonic acid and salt	Yes	ACY, ATL, VPC.
o-Anisidinmethanesulfonic acid	No	VPC.
Anisole, tech	No	CHF.

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
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.
Benzene phosphorous chloride	No	ICI.
Benzenesulfonic acid	No	UPF.
Benzenesulfonic acid, 2-formyl-, sodium salt	No	(?).
Benzenesulfonyl chloride	No	ICI, UPF.
1,2,4,5-Benzenetetracarboxylic acid	No	AMO.
1,2,4-Benzenetricarboxylic acid, 1,2-dianhydride (Trimellitic anhydride)	No	AMO.
Benzhydrol (Diphenylmethanol)	No	PD.
Benzimidazole	No	EK.
Benzoic acid, 2-[4-(dimethylamino)-benzoyl]-	No	(?).
Benzoic acid, methyl ester	No	HCF.
Benzoic acid, tech	Yes	KLM, PFZ, VEL.
Benzonitrile	No	PSG.
Benzophenone	No	CWN.
2-Benzothiazolethiol, sodium salt	No	BFG, USR.
1H-Benzotriazole	No	PSG.
2-Benzoxazolethiol	No	EK.
Benzoyl chloride	No	HK, VEL.
Benzylamine	No	HXL, KLM.
2-(Benzylamino)ethanol	No	HXL.
2-Benzyl-2'-hydroxy-5,9-dimethyl-6,7-benzomorphanhydrobromide	No	SD.
1-Benzyl-4-phenylisonipecotonitrile	No	SDW.
Benzyltrimethylammonium hydroxide	No	RSA.
4,4'-Biphenol	No	SCN.
Biphenyl	Yes	CI, KHI, MON, SOC.
2,6-Bis(p-azidobenzylidene)-4-methylcyclohexanone	No	(?).
N,N-Bis(2-hydroxyethyl)-p-toluidine	No	RSA.
N,N-Bis(4-methylphenyl)sulfonylamine, potassium salt	No	EK.
1,2-Bis(tribromophenoxy)ethane	No	GTL.
3-Bromoacetophenone	No	(?).
Bromobenzene, mono	No	DAZ, GTL.
p-Bromobenzenesulfonyl chloride	No	EK.
o-Bromobenzoic acid	No	PD.
2-Bromodibenzofuran	No	ARS.
2-Bromo-4,6-dinitroaniline	No	HCL.
1-Bromo-4-ethoxy-2-methylbenzene	No	(?).
Bromoethylbenzene	No	GTL.
p-Bromofluorobenzene	No	(?).
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.
2-[(1-Butyl-2-methylindol-3-yl)carbonyl]benzoic acid	No	(?).
o-sec-Butylphenol	No	SCN, TNA.
o-tert-Butylphenol	No	TNA.
p-sec-Butylphenol	No	SCN.
p-tert-Butylphenol	No	PSG, SCN.
Butylphenols, mixed	No	PSG, TNA, (?.)
p-tert-Butyltoluene	No	GIV.
6-tert-Butyl-2,4-xyleneol	No	GAF, PSG.
4,4'-Carbonylbis [phthalic anhydride]	No	ACH.
N-Carboxy-N-methylanthranilic anhydride	No	(?).

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
2-Chloroacetophenone	No	EK.
1-(3-Chloro-allyl)-D-3,5,7-triaza-1-azoniaadamantane chloride	No	DOW.
2-Chloro-4-aminotoluene	No	LMC.
o-Chloroaniline	No	CWN, 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-dlethoxybenzene	No	ALL.
1-Chloro-2,5-dlethoxy-4-nitrobenzene	No	ALL.
4'-Chloro-2',5'-dimethoxyacetacetanilide	No	HCL.
2-Chloro-1,4-dimethoxybenzene	No	CHF.
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	No	SDC.
4-Chloro-3,5-dinitrobenzenesulfonic acid	No	LMC.
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.
N-(4-Chlorophenyl)-N'-(3,4-dichlorophenyl)urea	No	VPC.
4-Chloro-o-phenylenediamine	No	FMT.
4-Chlorophthalic acid	No	PSG.
3-Chloropropyl-2,5-xylyl ether	No	PD.
2-Chloropyridine	No	OMC.
4-Chlororesorcinol	No	PCW.
2-(4-Chlorosulfonylphenyl)ethyltrichlorosilane	No	NOD.
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	(?).
4-Chloro-3,5-xylene	No	FER.
Cis-1-(3-Chloro-allyl)-3,5,7-triaza-1-azoniaadamantane chloride	No	DOW.
Copper, [2,2',2'',2'''-[9H,31H-phthalocyanine]penty]pentakis(methylene)]pentakis[1H-isolindole-1,3(2H)-dionato]]	No	(?).
Cresols:		
m-Cresol	No	MER.
o-Cresol:		
o-Cresol, from petroleum	No	GE, MER, PSG.
p-Cresol	No	MER, PSG.
Cresole, mixed:		
(m,p)-cresol:		
(m,p)-Cresol, from petroleum	No	MER, PSG.
Cresylic acid, refined:		
Cresylic acid, refined: from petroleum	No	MER, PSG.
Cumene (Isopropyl benzene)	Yes	ASH, BTL, GGC, GRS, KHI, SHC, SOC, TX.
Cumene hydrogen peroxide	No	ART.
Cumenesulfonic acid	No	NES.
4-(Cyanooctyl)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.

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
1,2-Cyclohexanedicarboxylic acid anhydride	No	BCC, HK.
Cyclohexanol	No	ACS, BAS, DUP, MON.
Cyclohexanone	Yes	ACS, BAS, CNP, DUP, MON.
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.
Cyclooctadene	No	DUP.
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.
Decyldiphenyl oxide	No	TCC.
3-Diacetoxyethylaminobenzanilide	No	HCL.
DI-N- β -acetoxyethyl-m-toluidine	No	SDC.
Dialkylbenzene	No	VST.
1,3-Diaminocyclohexane	No	DUP.
4,4'-Diaminodiphenyl sulfone	No	TLI.
2,6-Diaminopyridine	No	RIL.
2,5-Dianilino-terephthalic acid	No	VPC.
Dibenzylaminosuccinic acid	No	(²).
m-Dibromobenzene	No	DAZ.
p-Dibromobenzene	No	DAZ.
(1,2-Dibromoethyl)benzene	No	DAZ.
2,6-Dibromo-4-nitroaniline	No	HCL.
p-Dibutoxybenzene (DBB)	No	ALL.
2,5-Dibutoxy-4-morpholinobenzene-diazonium sulfate salt (DBB sulfate)	No	ALL.
2,5-Dibutoxy-4-morpholinonitrobenzene	No	ALL.
Dibutyl-p-cresol	No	PSG.
2,4-Di-tert-butylphenol	No	PSG, SCN.
2,6-Di-tert-butylphenol	No	SCN.
2,6-Di-tert-butylphenol	No	TNA.
2,6-Di-tert-4-sec-butylphenol	No	SCN.
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	MON, PPG, SCC, SOI.
3,3'-Dichlorobenzidine base and salts	No	CWN, LMC.
3,4-Dichlorobenzotrifluoride	No	HK, (²).
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-4-(2-nitro-4-trifluoromethylphenyl)-cinnamic acid	No	SK.
2,6-Dichloropyridine	No	OMC.
p, α -Dichlorotoluene	No	HK.
2,4-Dicumylphenol	No	SCN.
Dicyclohexylamine	No	AIP.
Dicyclopentadiene (includes Cyclopentadiene)	Yes	CXI, DOW, ENJ, LYP, SHC, VEL.
α , α -Diethoxyacetophenone	No	CWN.
p-Diethoxybenzene	No	ALL.

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
2,5-Diethoxy-4-morpholinonitrobenzene	No	ALL.
p-(Diethylamino)benzaldehyde	No	MCK, VPC.
4-(Diethylamino)benzaldehyde, 1,1-diphenylhydrazone	No	EKT.
2-[4-(Diethylamino)-2-hydroxybenzyl]benzoic acid	No	(²).
4-(Diethylamino)-2-methylbenzaldehyde	No	(²).
m-(Diethylamino)phenol (N,N-Diethyl-3-aminophenol)	No	HIL.
3-(Diethylamino)propophenone	No	SCP.
N,N-Diethylaniline	No	BCC, DUP.
2,6-Diethylaniline	No	TNA.
Diethylbenzene	No	UPM.
N,N-Diethylcyclohexylamine	No	AIP.
3,5-Diethyl-1,2-dihydro-1-phenyl-2-propylpyridine	No	RIL.
3,5-Diethyltoluene	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-(2,3-Dihydro-1,3-dioxo-1H-inden-2yl)-(quinolinyl)-6-methylbenzothiazole-7-sulfonic acid	No	VPC.
Dihydrophenylglycine sodium methyl diane salt	No	KAN.
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.
Diisopropylbenzene	No	EKT, GGC.
2,6-Diisopropyl-4-phenoxyaniline	No	TNA.
2,5-Dimethoxybenzaldehyde	No	CWN.
m-Dimethoxybenzene	No	ACY.
p-Dimethoxybenzene	No	CHF.
p-(Dimethylamino)benzaldehyde	No	(²).
m-(Dimethylamino)benzoic acid	No	HIL.
2-[4-(Dimethylamino)benzoyl]benzoic acid	No	EK.
m-Dimethylaminophenol	No	ACY, 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	HXL.
Dimethyl-1,4-cyclohexanedicarboxylate	No	EKT.
N,N-Dimethylcyclohexylamine	No	AIP, BAS.
4,4'-Dimethyldiphenyl ether	No	TNA.
5,5-Dimethylhydantoin	No	BRD.
2,6-Dimethylnaphthalene	No	UPM.
Dimethyl-2,6-naphthalenedicarboxylate	No	AMC, UPF.
N,N'-Dimethyl-3,4,9,10-perylenetetra-carboxylic acid 3,4:9,10-dilimide	No	VPC.
3,5-Dimethylpiperidine	No	RIL.
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-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.
2,4-Dinitrotoluene	No	DUP.

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
2,4 (and 2,6)-Dinitrotoluene	No	ICI, RUC, (?).
3,5-Dinitro-p-toluenesulfonic acid	No	(?).
Dinonylphenol	No	TX.
2,4-Dioxo-3-azaspiro[5,5]undecane-1,5-dicarbonitrile mono sodium salt	No	PD.
DI-para-benzoquinone dioxime	No	LC.
2,4-DI-tert-pentylphenol	No	PAS, PSG, SCN.
Diphenylamine	No	ART, RUC, USR.
Diphenyldimethoxysilane	No	NOD.
Diphenyldisulfide	No	PAH.
Diphenyl phosphorous chloride	No	ICI.
Diphenyl phthalate	No	EK, UPF.
DI-2-picolyamine	No	RIL.
1,3-DI-4-piperidylpropane	No	RIL.
2,5-DI-p-toluidinoterephthalic acid	No	VPC.
1,5-Dlureldonaphthalene	No	SOI.
Divinylbenzene	No	DOW, TCC.
Dodecylphenyl oxide	No	TCC.
Dodecylnitrobenzene	No	LMC.
p-Dodecylphenol	No	MON, SCN.
4-Ethanolpiperidine	No	RIL.
2-Ethanolpyridine	No	RIL.
5-Ethoxy-3-trichloromethyl-1,2,4-thiadiazole	No	OMC.
Ethlsterone	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	MIL, SCP.
3-(N-Ethylanilino)propionitrile	No	SCP.
α-(N-Ethylanilino)-m-toluenesulfonic acid	No	HIL.
Ethylbenzene	Yes	AMO, ATR, CSD, DOW, ELP, GE, HCL, KHI.
2-(N-Ethyl-N, -cyanoethyl)-4-acetaminoanilole	No	SCP.
N-Ethylmaleimide	No	REG.
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.
5-Ethyl-2,3-pyridinedicarboxylic acid	No	NES.
N-Ethyl-m-toluidine	No	DUP, FST.
3-(N-Ethyl-m-toluidino)propionitrile	No	SCP.
p-Fluoroaniline	No	DAZ.
o-Fluorobenzoyl chloride	No	OMC.
5-Fluoro-2-methyl-1-[4-(methylsulfinyl)phenyl]-methylene-1h-Indene	No	MRK.
p-Fluoronitrobenzene	No	(?).
1-Formylpiperidine	No	RIL.
Furan	No	QKO.
Furfuryl alcohol	No	QKO.
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-Hydroxybenzenesulfonic acid	No	UPF.
p-Hydroxybenzoic acid	No	LEM.
4-Hydroxybenzylbenzene	No	TNA.
2'-Hydroxy-5,9-dimethyl-6,7-benzomorphan	No	SD.
3-[N-(2-Hydroxyethyl)anilino]propionitrile	No	SCP.

See footnotes at end of table.

Table 3-2—Continued

Cyclic intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
N- β -Hydroxyethyl-2,4-dihydroxybenzamide	No	PCW.
5-Hydroxylsophthalic acid	No	MRF.
2-Hydroxymethylene-17 α -ethinylandrosta-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	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.
2-Imidazolidinone modification	No	(?).
5-Indanol	No	(?).
Isatoic anhydride	No	PSG.
Isobutylbenzene	No	PLC, TNA.
Isobutylbiphenyl	No	TCC.
Isobutyrophenone	No	ARS.
Isocyanic acid derivatives:		
Bitoluene diisocyanate (TODI)	No	CWN.
Diphenylmethane-4,4'-diisocyanate (MDI)	Yes	BAS, DOW, ICI, MOB, RUC.
Polymethylene polyphenylisocyanate	No	BAS, ICI, RUC.
Toluene 2,4- and 2,6-diisocyanate (80/20 Mixture)	Yes	BAS, DOW, ICI, MOB, OMC, RUC.
p-Toluenesulfonyl isocyanate	No	CWN.
Isonicotinamide	No	RIL.
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, SCP.
4,4'-Isopropylidenediphenol, propoxylated	No	ICI, SCP.
o-Isopropylphenol	No	FMC.
Isopropylphenol, mixed	No	PSG.
Isothiocyanic acid, phenyl ester	No	EK.
2,6-Lutidine	No	RIL.
3,4-Lutidine	No	RIL.
Magnesium bis(4-nitrobenzylmalonate) dihydrate	No	(?).
Malonanilide	No	PCW.
Melamine	No	ACY, MLC.
dl-p-Mentha-1,8-diene (Limonene)	No	ARZ, NCI.
4-Methoxybenzyl alcohol	No	BUC.
2-Methoxyethylpiperidine	No	RIL.
N-(4-Methoxy-3-nitrophenyl)acetamide	No	SDC.
2-(N-Methylanilino)ethanol	No	SCP.
3-(N-Methylanilino)propionitrile	No	SCP.
2-Methylantraquinone	No	ACY.
Methyl-2-benzimidazole carbamate	No	CED.
2-Methylbenzothiazole	No	FMT.
o-Methylbenzoyl chloride	No	TLC.
4-Methylbenzoyl chloride	No	TLC.
Methylbenzyl alcohol	No	TNA.
N-Methylbenzylamine	No	HXL.
Methyl-bis-diisopropylaniline	No	TNA.
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.

See footnotes at end of table.

Table 3-2—Continued

Cyclic intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
4-Methyl-2,6-dinitrophenol	No	PSG.
4,4-Methylenedi(2,6-di-tert-butylphenol)	No	TNA.
4,4'-Methylenedi[N,N-dimethylaniline]	No	ACY.
4,4'-Methylenedi[N,N-dimethylaniline] (Methane base)	No	ACY.
2,2'-Methylenedi(4-methyl-6-nonyl-p-cresol)	No	PSG.
4,4'-Methylenedianiline	No	RUC, USR.
5,5'-Methylenedisalicylic acid	No	KLM.
N-Methyl-2-ethanolpiperidine	No	RIL.
Methyl p-formylbenzoate	No	EKT.
(2,4-Methyl-5-imidazolyl)methylthioethylamine dihydrochloride-	No	SK.
2-Methylindole	No	(?).
4-Methyl-N-(4-methylphenyl)sulfonylbenzenesulfonamide	No	EK.
N-Methyl-p-nitroaniline	No	ACY, USR.
4-Methyl-2-nitroanisole	No	PSG.
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	No	BCC.
N-(3-Methylphenyl)acetamide	No	SDC.
4-(1-Methyl-1-phenyl)ethylphenol	No	SCN.
4-Methylphthalic acid	No	EK.
1-Methylpiperidine	No	RIL.
2-Methylpiperidine	No	RIL.
α -Methylstyrene	No	ART, GGC, TX.
ar-Methylstyrene (Vinyltoluene)	No	BTL.
Methylthiobenzoic acid	No	(?).
Myristylbenzyltrimethylammonium chloride $\cdot 2H_2O$	No	PCW.
1-Naphthaldehyde	No	GNW.
2,6-Naphthalenedicarboxylic acid	No	AMO.
2-Naphthalenesulfonic acid	No	ACY.
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	No	BUC, MON.
p-Nitroaniline	No	DUP, MON.
5-Nitroanthranilic acid	No	SAL.
1-Nitroanthraquinone	No	SDC.
Nitrobenzamide	No	PD.
Nitrobenzene	No	FST, ICI, 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-p-cresol	No	PSG.
5-Nitrodimethylsophthalate	No	SAL.
Nitrodiphenylamine	No	ACY, MON.
5-Nitrosophthalic acid	No	SAL.
3-Nitro-4-methylacetophenone	No	TLI.
p-Nitrophenethyl alcohol	No	PCW.
p-Nitrophenol	No	DUP, MON.
p-Nitrophenol, sodium salt	No	DUP.
3(and 5)-Nitrosalicylic acid	No	SAL.
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.

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
(2-Nitro-4-trifluoromethylphenyl)acetic acid	No	SK.
Nonylphenol	Yes	GAF, GE, KLM, MON, RH, SCN, TX.
Octylphenol	Yes	PSG, RH, SCN.
Octylphenoxydiethoxy chloride	No	RH.
5-Oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	No	HCL.
4,4'-Oxydianiline	No	CHT, DUP.
Parahydroxyphenylglycine potassium methyl dane salt	No	KAN.
o-Pentylphenol (o-Amylphenol)	No	PAS, SCN, (?).
p-tert-Pentylphenol	No	PAS.
3,4,9,10-Perylene-tetracarboxylic-3,4:9,10-dianhydride	No	VPC.
3,4,9,10-Perylene-tetracarboxylic-3,4:9,10-dlmlide	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:		
By caustic fusion:		
All other phenol, synthetic, by caustic fusion	No	ISP.
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.
All other phenol, synthetic	No	KLM, SHC, TX.
Phenolsulfonaphthalein	No	EK.
Phenolsulfonaphthalein, sodium salt	No	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.
4-(Phenylazo)-1-naphthylamine	No	OMC.
m-Phenylenedibismaleimide	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, potassium salt	No	KAN.
Phenylglycine, sodium salt	No	LIL.
Phenylglycol esters	No	BCC.
2,2'-[(Phenyl)imino]diethanol (N-Phenyldiethanolamine)	No	MIL, SCP.
2,2'-[(Phenyl)imino]diethanol, diacetate ester	No	SCP.
o-Phenylphenol	No	DOW.
p-Phenylphenol	No	DOW.
o-Phenylphenol, sodium salt	No	DOW.
N-Phenyl-p-phenylenediamine	No	USR.
Phenylphosphinic acid	No	FER.
Phenylphosphinic acid, potassium salt	No	FER.
Phenylphosphinic acid, sodium salt	No	FER.
1-Phenyl-1,2-propanedione, 2-oxime	No	ORT.
4-Phenylpropylpyridine	No	RIL.

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic Intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
dl-Phenylsuccinic acid	No	PD.
Phenyltrimethyl ammonium chloride	No	LLI.
Phthalic acid	No	EK.
Phthalic anhydride	Yes	ART, BAS, ENJ, KPT, SC, STP, USR.
Phthalimide	No	PSG.
[Phthalocyaninato(2-)]copper	No	PHC.
[Phthalocyaninato(2-)]iron	No	PHC.
[Phthalocyaninetetramethanaminato]copper	No	(²).
Phthalocyaninetetrasulfonyl chloride, copper derivative	No	VPC.
Phthaloyl chloride (Phthalyl chloride)	No	TLC.
Picolines:		
2-Picoline (α -Picoline)	No	RIL.
3-Picoline (β -Picoline)	No	NEP, RIL.
4-Picoline (γ -Picoline)	No	RIL.
Picolinonitrile (2-Cyanopyridine)	No	NEP.
3-Picolylamine	No	RIL.
Picric acid (Trinitrophenol)	No	SDC.
Piperidine	No	AIP, RIL.
Polyethylbenzene (80 percent diethylbenzene)	No	ELP.
Propiophenone	No	ORT.
8,16-Pyranthredione	No	PCW.
1,3,6,8-Pyranetetrasulfonic acid	No	(²).
Pyridine hydrochloride	No	RSA.
Pyridine, refined:		
2 ^o Pyridine, refined	No	NEP.
All other pyridine, refined grades	No	RIL.
3-Pyridinemethanol	No	RIL.
2-Pyridinethiol-1-oxide, sodium salt	No	OMC.
2-Pyridinethiol-1-oxide, zinc salt	No	OMC.
3-Pyridinol	No	RIL.
Pyromellitic dianhydride	No	ACH.
2-Pyrrolidone (2-Pyrrolidone)	No	GAF.
Pyrvinium pamoate	No	(²).
Quinaldine	No	ACY.
Quinoline:		
Quinoline-2,3-dicarboxylic acid	No	NES.
2-Quinolindol	No	EK.
Quinone dioxime	No	LC.
Resorcinol, dimethyl ether	No	BAS.
Resorcinol, tech.	No	CIC, ISP.
β -Resorcylic acid	No	ISP.
Salicylaldehyde	No	RDA.
Salicylaldehyde oxime	No	EK.
Salicylanilide	No	PCW.
Salicylic acid, tech.	Yes	DOW, HIL, KLM, MON, RDA.
Sodium p-sulfophenylmethyl ether	No	SAL.
Sodium trichlorobenzenesulfate	No	UPF.
Spiro[3H-1,2-benzoxathiole-3,9'-[9H]-xanthene]-3',6'-diol-1,1-dioxide	No	(²).
Styrene (Vinylbenzene)	Yes	AMO, ATR, CSD, DOW, ELP, GE, HCL, PLC, SC, SOC.
Sulfanilic acid (p-Aminobenzenesulfonic acid) and salt	No	HIL.
5-Sulfisophthalic acid, 1,3-dimethyl ester	No	PCW.
5-Sulfisophthalic acid, 1,3-dimethyl ester, sodium salt	No	DUP.
5-Sulfisophthalic acid, lithium salt	No	EKT.
5-Sulfisophthalic acid, sodium salt	No	EKT, PCW.
4-Sulfophthalic acid	No	CWN.
Terephthalic acid	No	AMO, DUP, HCF.
Terephthalic acid, dimethyl ester	Yes	DUP, EKT, HCF.
Terephthaloyl chloride	No	DUP, TLC.

See footnotes at end of table.

Table 3-2—Continued

Cyclic Intermediates for which U.S. production and/or sales were reported, Identified by manufacturer, 1989

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
Terphenyl (Phenylbiphenyl) (m-, o-, and p-isomers)	No	MON.
1-Tert-butyl-2,5-dimethoxybenzene	No	EKT.
Tetrabromophthalic anhydride	No	TNA.
Tetrachlorophthalic anhydride	No	MON.
Tetrahydrofuran	Yes	BAS, DUP, GAF, QKO.
1,2,3,4-Tetrahydronaphthalene	No	RDA.
2,2',3,3'-Tetrahydro-3,3,3',3'-tetramethyl-1,1'-spiro[11H-Indene]-5,5',6,6'-tetrol	No	SCN.
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.
Thiodiphenol	No	CRZ.
Thiophenol	No	ICI.
Toluene-2,3-(and 3,4)-diamine (35/65 mixture)	No	OMC.
Toluene-2,4-diamine (4-m-Tolylendiamine)	No	RUC, (2).
Toluene-2,4-(and 2,6)-diamine (80/20 mixture)	No	OMC.
Toluene-3,4-diamine	No	(2).
p-Toluenesulfonamide	No	UTC.
p-Toluenesulfonic acid	No	TEN, UPF.
p-Toluenesulfonic acid, aniline salt	No	NES.
o-Toluenesulfonyl chloride	No	UPF.
m-Toluid acid	No	WTC.
p-Toluid acid, methyl ester	No	HCF.
o-Toluidine	No	DUP, FST.
m-Toluidine	No	DUP, FST.
p-Toluidine	No	DUP, FST.
m-Toluidinomethanesulfonic acid	No	ATL.
2,2'-(m-Tolylimino)diethanol	No	MIL, SCP.
Tolyltriazole	No	PSG.
N,N,N-Tribenzylamine	No	HXL.
ar-Tribromoethyl benzene	No	(2).
2,4,6-Tribromophenol	No	GTL.
3,4',5-Tribromosalicylanilide	No	PCW.
2,4,6-Tri-tert-butylphenol	No	SCN.
1,2,3(and 1,2,4)-Trichlorobenzene	No	PPG, SCC.
1,2,4-Trichlorobenzene	No	SCC.
3-Trichloromethyl-1,2,4-thiadiazole	No	OMC.
1,2,4-Trichloro-5-nitrobenzene	No	PCW.
Trichlorophenylsilane	No	DCC.
α,α',α''-Trichlorotoluene (Benzotrchloride)	No	HK, VEL.
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	No	DGC.
Tri(dimethylaminomethyl)phenol	No	PEL.
Trimellitic trichloride	No	TLC.
1,2,4-Trimethylbenzene (Pseudocumene)	No	KHI.
1,3,5-Trimethylbenzene (Mesitylene)	No	ABB.
1,3,3-Trimethyl-δ ² , α-indolineacetaldehyde	No	VPC.
2,3,6-Trimethylphenol	No	GE.
Triphenylmethane	No	EK.
Triphenylphosphine	No	(2).
α,α',α''-Tris(dimethylamino)mesitol	No	RH.
Tris(2-methyl-1-aziridinyl)phosphine oxide	No	ARS.
7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid] (J-Acid urea)	No	S.
Veratraldehyde (3,4-Dimethoxybenzaldehyde)	No	GIV.
2-Vinylpyridine	No	RIL.
4-Vinylpyridine	No	RIL.
o-Xylene (90-100% of o-xylene isomer)	Yes	ENJ, KHI, LYP, PLC, PPR, SM.
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.
2,4-Xylenesulfonic acid	No	UPF.
Xylenesulfonic acid, mixed isomers	No	NES.

See footnotes at end of table.

Table 3-2—Continued

Cyclic intermediates for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Cyclic intermediates	Separate statistics ¹	Manufacturers' identification codes (according to list in table 3-3)
Cyclic—Continued		
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.
Xylenols, not classified as to boiling point	No	GE.
Xyldines:		
Xyldine, original mixture	No	DUP.
4-(2,4-Xylylazo)-2,5-xyldine	No	ACH.
All other cyclic intermediates	Yes	ACY, AMB, ATL, BRD, BRS, BUC, CHD, CRZ, DUP, 2EK, EKT, GIV, HCF, HCL, HIL, HK, HXL, LC, NOD, OMC, PAH, PCW, PFZ, PSG, RAY, RIL, S, SAL, SCH, SCP, SDC, SDW, SK, TLI, TNA, TRD, UPF, UPJ, UPJ, UPJ, VPC, (2), (2), (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 3-3

Cyclic Intermediates: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
ABB	Abbott Laboratories		Bedford Chemical Div. Grant Div.
ACH	Alco Chemical Corp.	FMC	FMC Corp., Nitro Div.
ACS	Allied Signal Inc., Engineered Material Sector	FMN	Agricultural Chemical Group
ACY	American Cyanamid Co.	FMT	Fairmount Chemical Co., Inc.
AIP	Air Products & Chemicals, Inc.	FST	First Chemical Corp.
ALL	Alliance Chemical, Inc.	GAF	GAF Chemical Corp.
AMB	American Bio-Synthetics Corp.	GE	General Electric Co., Speciality Chemical Group
AMO	Amoco Corp.	GGC	Georgia-Gulf Corp.: Houston Div. Plaquemine Div.
ANG	Angus Chemical Co.		
ARK	Armstrong World Industries, Inc.	GIV	Givaudan Corp
ARS	Arsynco, Inc., Sub. Div. of Aceto Corp.	GNW	Greenwood Chemical Co.
ART	Aristech Chemical Corp., Chemical Div.	GRS	Champlin Refining Co.
ARZ	Arizona Chemical Co.	GTL	Great Lakes Chemical Corp.
ASH	Ashland Oil, Inc., Ashland Petroleum Co.	GYR	Goodyear Tire & Rubber Co.
ATL	Atlantic Industries, Inc.	HCF	Cape Industries
ATR	Atlantic Richfield Co., Arco Chemical Co.	HCL	Hoechst Celanese Corp.: Bayport Works Fine Chemicals Div. Sou-Tex Works Specialty Chem Group
BAS	BASF Corp.	HIL	Hilton Davis Co.
BCC	Buffalo Color Corp.	HK	Occidental Chemical Corp., ED & S Div.
BEE	Beecham Inc., Beecham Laboratories Div.	HPC	Hercules, Inc.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group	HXL	Hexcel Corp., Hexcel Chemical Products
BRD	Lonza, Inc.	ICI	ICI Americas, Inc., Agricultural Chemicals Div. Polyurethanes Group Specialty Chem Div.
BRS	Bristol-Myers Co.	ISP	Indspec Chemical Corp.
BTL	BTL Speciality Resin Corp.	KAN	Kanasco, Ltd
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	KHI	Koch Refining Co.
CCC	C.N.C. International, Inc.	KLM	Kalama Chemical, Inc.
CED	Cedar Chemical Co.	LC	Lord Corp., Chemical Products Group
CHD	Chemdesign Corp.	LEM	Napp Chemicals, Inc.
CHF	Kincaid Enterprises, Inc.	LIL	Eli Lilly & Co.
CHT	Chattem, Inc.	LLI	Lee Laboratories, Inc.
CIC	Color Chem International Corp.	LMC	Lomac, Inc.
CNP	DSM Chemicals North America	LYP	Lyondell Petrochemical Co.
CPS	CPS Chemical Co., Inc.	MAL	Mallinckrodt, Inc.
CRZ	James River II Corp.	MCK	MacKenzie Chemical Works, Inc.
CSD	Fina Oil & Chemicals Co., Cosden Chemical Div.	MER	Merichem Co.
CWN	Upjohn Co., Fine Chemicals	MIL	Milliken & Co., Milliken Chemical Div.
CXI	Chemical Exchange Industries, Inc.	MLC	Melamine Chemicals, Inc.
DAZ	Diaz Chemical Corp.	MNA	Monsanto Agriculture Co.
DCC	Dow Corning Corp.	MON	Monsanto Co.
DGC	Degussa Corp.	MRF	Morflex, Inc.
DIX	Dixie Chemical Co., Inc.	MRK	Merck & Co., Inc.
DKA	Mobay Synthetics Corp.	NCC	Niacet, Corp.
DOW	Dow Chemical Co.	NCI	Union Camp Corp., B B A Div.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept. Petrochemicals Dept.	NEP	Nepera, Inc.
EK	Eastman Kodak Co.:	NES	Ruetgers-Nease Chemical Co.
EKT	Tennessee Eastman Co. Div.	NOD	Huls America, Inc.
ELP	Rexene Products Company		
ENJ	Exxon Chemical Americas		
FER	Ferro Corp.:		

See note at end of table.

Table 3-3—Continued

Cyclic Intermediates: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
NSC	National Starch & Chemical Corp.	SDC	Sandoz Chemicals Corp.
OMC	Olin Corp.	SDW	Sterling Drug, Inc., Organic Div.
ORT	Rohr Chemicals, Inc., Div. of Aceto Corp.	SHC	Shell Chemical Co.
PAH	Parish Chemical Co.	SK	Smithkline Beecham Chemicals
PAS	Atocem North America, Inc.	SOC	Chevron Corp., Chevron Chemical Co.
PCW	Pfister Chemical, Inc.	SOG	Hill Petroleum Company
PD	Parke-Davis Div. of Warner-Lambert Co.	SOI	Specialty Organics, Inc.
PEL	Pelron Corp.	SRL	G. D. Searle & Co.
PFZ	Pfizer, Inc., & Pfizer Pharmaceuticals, Inc.	STP	Stepan Co.
PHC	Phthalchem, Inc.	STX	St. Croix Petrochemical Corp.
PLC	Phillips 66 Co.	SUN	Sun Company, Inc.
PPG	PPG Industries, Inc.	TCC	Sybron Chemicals, Inc.
PPR	Phillips Puerto Rico Core, Inc.	TEN	Tennessee Chemical Co.
PPX	Phillips Paraxylene, Inc.	TLC	Twin Lake Chemical, Inc.
PSG	PMC, Inc., PMC Specialty Group, Inc.	TLI	Teledyne Industries Inc., Teledyne McCormick Selph
QKO	QO Chemicals, Inc.	TNA	Ethyl Corp.
RAY	Rayonier Chemical Products, Inc.	TRD	Bristol Myers Squibb Co.
RDA	Rhone-Poulenc, Inc.	TX	Texaco Chemical Co.
REG	Regie Chemical Co.	UOC	Unlon Oil Co., of California
RH	Rohm & Haas Co.	UPF	Sloss Industries
RIL	Rellly Industries, Inc.	UPJ	Upjohn Co.
RSA	R. S. A. Corp.	UPM	UOP, Inc.
RUC	Rubicon, Inc.	USM	Crown Metro, Inc.
S	Sandoz Chemicals Corp.	USR	Uniroyal Chemical Co., Inc.
SAL	Solvay Animal Health Inc.	UTC	Unitex Chemical Corp.
SC	Sterling Chemicals, Inc.	VEL	Velcol Chemical Corp.
SCC	Standard Chlorine of Delaware, Inc.	VNC	Vanderbilt Chemical Corp.
SCH	The Schering Corp.	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
SCN	Schenectady Chemical, Inc.	VST	Vieta Chemical Co.
SCP	Henkel Corp.	WAY	Olin Hunt Specialty Products, Inc.
SD	Sterling Drug, Inc., Sterling Pharmaceuticals, Inc.	WTC	Witco 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 1989 amounted to 174 million kilograms, or 37 percent more than the 127 million kilograms produced in 1988 (table 4-1). Sales of dyes in 1989 amounted to 146 million kilograms, valued at \$858 million, compared with 114 million kilograms, valued at \$766 million, in 1988. In terms of quantity, sales of dyes in 1989 was 28 percent higher, and in terms of value 12 percent higher. The average unit value of sales of all dyes in 1989 was \$5.88 per kilogram, compared with \$6.73 per kilogram in 1988.

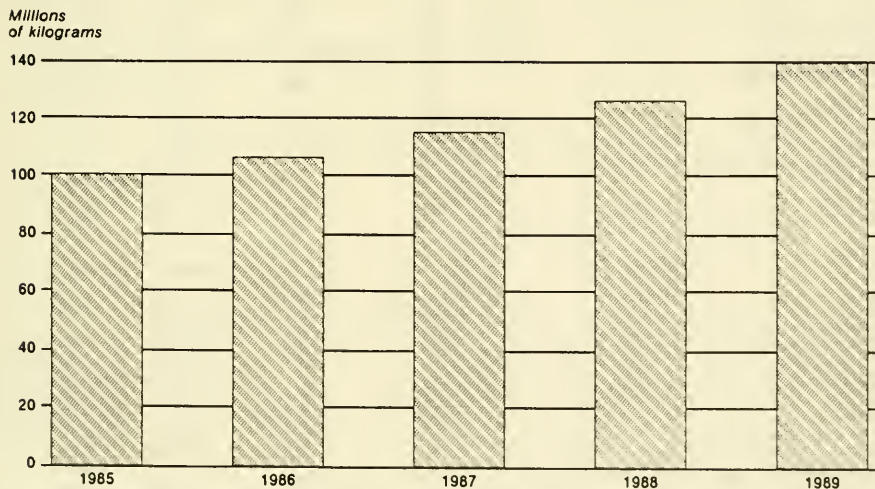
Production of four classes of dyes decreased in 1989, while the remaining six major classes increased their production. Fiber-reactive dyes and fluorescent brightening agents registered significant increases in 1989 while acid and basic dyes registered a noticeable declines. Changes in U.S. production of synthetic dyes followed overall changes in U.S. economic activity during 1985-89 (see figure 4-1).

Table 4-2 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 4-3.

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202-252-1363

(Effective 1/14/91 202-205-3363)

Figure 4-1
Dyes: U.S. production, 1985-89



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

Table 4-1

Dyes: U. S. production and sales, 1989

Dyes	Production	Sales		Average Unit value ¹
		Quantity	Value	
		1,000 kilograms	1,000 kilograms	1,000 dollars
Grand total	174,358	145,757	857,554	\$5.88
Acid dyes				
Total	5,764	6,339	73,370	11.57
Acid yellow dyes	730	1,072	10,075	9.40
Acid orange dyes	640	1,106	7,515	6.79
Acid red dyes, total	1,005	989	12,871	13.01
Acid Red 1	(²)	103	761	7.41
Acid Red 137	(²)	12	248	20.49
Acid Red 182	(²)	250	2,485	9.92
All other acid red dyes	(²)	624	9,377	15.03
Acid violet dyes	25	46	959	20.85
Acid blue dyes, total	1,787	1,836	27,874	15.18
Acid Blue 324	637	648	9,193	14.19
All other acid blue dye	1,150	1,188	18,681	15.72
Acid green dyes	101	75	1,457	19.43
Acid brown dyes	578	368	3,970	10.79
Acid black dyes	898	847	8,649	10.21
Basic dyes (classical and modified)				
Total	5,476	5,235	70,523	13.47
Basic yellow dyes	1,479	1,461	14,723	10.08
Basic orange dyes	255	247	2,698	10.92
Basic red dyes, total	762	741	10,854	14.65
Basic Red 15	225	201	1,504	7.49
All other basic red dyes	537	540	9,350	17.31
Basic violet dyes, total	1,546	1,422	15,012	10.56
Basic Violet 3	600	570	5,133	9.00
All other basic violet dyes	946	852	9,879	11.59
Basic blue dyes	856	837	14,685	17.54
All other basic dyes	578	527	12,551	23.82
Direct dyes				
Total	28,823	20,949	118,619	5.66
Direct yellow dyes	7,374	7,002	35,602	5.08
Direct orange dyes	395	506	3,620	7.15
Direct red dyes, total	3,196	3,353	23,119	6.90
Direct Red 254	1,164	1,238	6,325	5.11
All other direct red dyes	2,032	2,115	16,794	7.94
Direct violet and green dyes	170	141	2,103	14.91

See footnotes at end of table.

Table 4-1—Continued

Dyes: U.S. production and sales, 1989

Dyes	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Direct dyes—Continued				
Direct blue dyes, total	2,639	2,784	25,134	\$9.03
Direct Blue 80	166	174	1,858	10.69
Direct Blue 86	281	318	2,453	7.71
Direct Blue 98	145	125	1,153	9.21
All other direct blue dyes	2,047	2,167	19,670	9.08
Direct brown dyes	116	139	1,333	9.59
Direct black dyes	14,933	7,024	27,708	3.94
Disperse dyes				
Total	12,184	10,595	117,706	11.11
Disperse yellow dyes	843	966	10,074	10.43
Disperse orange dyes, total	1,741	1,377	9,891	7.18
Disperse Orange 37	162	135	884	6.55
Disperse Orange 44 and 44:1	53	94	708	7.53
All other disperse orange dyes	1,526	1,148	8,299	7.23
Disperse red dyes, total	2,266	1,900	28,491	15.00
Disperse Red 73	245	188	1,652	8.78
Disperse Red 167 and 167:1	271	224	1,957	8.72
Disperse Red 177	169	142	1,754	12.34
All other disperse red dyes	1,581	1,346	23,128	17.20
Disperse violet dyes	705	343	4,353	12.69
Disperse blue dyes	4,919	4,556	51,650	11.32
Disperse black, brown and green dyes, total	1,710	1,453	13,247	9.12
Disperse Brown 1	434	374	2,790	7.46
All other disperse black, brown, and green dyes	1,276	1,079	10,457	9.70
Fiber-reactive dyes				
Total	13,832	9,820	118,972	12.12
Fluorescent brightening agents				
Total	60,711	57,181	119,787	2.09
Food, drug, and cosmetic colors				
Total	3,187	3,174	53,950	17.00
Food, drug and cosmetic dyes, total	3,043	3,033	48,400	15.96
Drug and cosmetic dyes, total ²	144	141	5,550	39.36
Mordant dyes				
Total	29	29	355	12.24

See footnotes at end of table.

Section 4

Table 4-1—Continued

Dyes: U.S. production and sales, 1989

Dyes	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Solvent dyes				
Total	5,539	3,985	44,805	\$11.24
Solvent yellow dyes	765	562	9,993	17.78
Solvent orange dyes	166	175	3,125	17.86
Solvent red dyes	1,415	1,447	15,082	10.42
Solvent blue dyes	1,860	516	7,593	14.72
All other solvent dyes	1,333	1,285	9,012	7.01
Vat dyes				
Total	16,714	16,699	78,861	4.72
Vat Yellow dyes	2	14	628	44.86
Vat orange dyes	65	89	1,692	19.01
Vat red dyes	185	298	7,944	26.66
Vat violet dyes	107	114	1,790	15.70
Vat blue dyes	15,839	15,285	54,646	3.58
Vat green dyes	197	219	2,448	11.18
Vat brown dyes	120	359	4,868	13.58
Vat black dyes	199	321	4,845	15.09
All other dyes				
Total ⁴	22,099	11,751	60,606	5.16

¹ Calculated from unrounded figures.² Reported data were accepted in confidence and may not be published, or no data were reported.³ The data include external drug and cosmetic dyes.⁴ 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 4-2

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Acid dyes	Yes	
Acid yellow dyes:	Yes	
Acid Yellow 3	No	BAS.
Acid Yellow 17	No	ATL, CK, HIL.
Acid Yellow 19	No	CK.
Acid Yellow 23	No	BAS, CK, HIL, LVR.
Acid Yellow 34	No	ATL.
Acid Yellow 36	No	ATL.
Acid Yellow 49	No	ATL, CK.
Acid Yellow 59	No	BAS, CK.
Acid Yellow 65	No	ATL.
Acid Yellow 73	No	HIL.
Acid Yellow 99	No	CK.
Acid Yellow 129	No	CGY.
Acid Yellow 135	No	ICI.
Acid Yellow 137	No	CK.
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	No	ATL, BAS, CGY, CK.
Acid Orange 10	No	ATL, CK.
Acid Orange 24	No	CK, FAB.
Acid Orange 60	No	CGY, CK.
Acid Orange 64	No	ATL.
Acid Orange 89	No	BAS.
Acid Orange 116	No	CK.
Acid Orange 128	No	CK.
Acid Orange 152	No	CK.
Acid Orange 156	No	CGY, CK.
Acid Orange 161	No	ATL.
Acid red dyes:	Yes	
Acid Red 1	Yes	ATL, BAS, CGY, CK, FAB.
Acid Red 4	No	ATL.
Acid Red 14	No	ATL, BAS.
Acid Red 33	No	FAB.
Acid Red 57	No	CK.
Acid Red 73	No	ATL, PSC, S.
Acid Red 87	No	HIL.
Acid Red 97	No	ATL.
Acid Red 119	No	CK.
Acid Red 137	Yes	ATL, BAS, CK, LVR.
Acid Red 151	No	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 256	No	CK.
Acid Red 278	No	CK.
Acid Red 296	No	BAS.
Acid Red 299	No	CK.
Acid Red 337	No	ATL, CK.
Acid Red 364	No	CK.
Acid Red 384	No	CK.
Acid Red 388	No	CK.
Acid Red 398	No	ICI.
Acid Red 410	No	ATL.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Acid dyes—Continued	Yes	
Acid red dyes—Continued	Yes	
Acid Red 418	No	CK.
Acid Red 419	No	CK.
All other acid red dyes	Yes	ATL, BAS, CK.
Acid violet dyes:	Yes	
Acid Violet 3	No	FAB.
Acid Violet 7	No	ATL, FAB.
Acid Violet 12	No	CGY.
Acid Violet 17	No	HIL.
Acid Violet 49	No	HIL.
Acid blue dyes:	Yes	
Acid Blue 9	No	BAS, CK, HIL, LVR.
Acid Blue 15	No	BAS.
Acid Blue 25	No	VPC.
Acid Blue 40	No	CK.
Acid Blue 41	No	CK.
Acid Blue 62	No	CK.
Acid Blue 67	No	CK.
Acid Blue 92	No	BAS.
Acid Blue 113	No	FAB.
Acid Blue 118	No	CK.
Acid Blue 145	No	ATL.
Acid Blue 231	No	ATL, CK.
Acid Blue 281	No	CK.
Acid Blue 283	No	CK.
Acid Blue 298	No	S.
Acid Blue 321	No	CK.
Acid Blue 324	No	ATL.
Acid Blue 330	Yes	CK, S, VPC.
All other acid blue dyes	No	ATL.
Acid green dyes:	Yes	
Acid Green 1	No	CK.
Acid Green 5	No	LVR.
Acid Green 16	No	WJ.
Acid Green 20	No	FAB, LVR.
Acid Green 25	No	ATL.
Acid Green 70	No	ATL, CK.
All other acid green dyes	No	CGY.
Acid brown dyes:	Yes	
Acid Brown 14	No	CK, LVR.
Acid Brown 19	No	CK.
Acid Brown 50	No	BAS.
Acid Brown 97	No	BAS, FAB.
Acid Brown 147	No	CK.
Acid Brown 159	No	BAS.
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	CK.
Acid black dyes:	Yes	
Acid Black 1	No	CK, LVR.
Acid Black 2	No	ATL, LVR.
Acid Black 52	No	CK, S.
Acid Black 60	No	CK.
Acid Black 63	No	BAS.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Acid dyes—Continued	Yes	
Acid black dyes—Continued	Yes	
Acid Black 92	No	FAB.
Acid Black 107	No	CK.
Acid Black 172	No	CK, ICI.
Acid Black 194	No	BAS.
Acid Black 210	No	BAS.
All other acid black dyes	No	BAS.
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.
Azolic brown compositions:	No	
Azolic Brown 9	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 14, 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, BUC.
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 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 41, salt	No	ALL.
Azolic Diazo Component 42, salt	No	ALL.
Azolic Diazo Component 44, salt	No	ALL.
Azolic Diazo Component 48, salt	No	ATL.
All other azolic diazo components, salt	No	ALL.
Azolic coupling components:	No	
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.
Azolic Coupling Component 14	No	ALL.
Azolic Coupling Component 17	No	ALL.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Azolic dyes and components—Continued		
Azolic coupling components—Continued		
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 35	No	PCW.
Azolic Coupling Component 43	No	ALL.
All other azolic coupling components	No	PCW.
Basic dyes (classical and modified):	Yes	
Basic yellow dyes:		
Basic Yellow 11	No	ATL, CK.
Basic Yellow 13	No	ATL.
Basic Yellow 15	No	CK.
Basic Yellow 28	No	BAS, VPC.
Basic Yellow 29	No	BAS.
Basic Yellow 53	No	CK.
Basic Yellow 58	No	VPC.
Basic Yellow 65	No	BAS.
Basic Yellow 78	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.
All other basic yellow dyes	No	ALL. (?)
Basic orange dyes:		
Basic Orange 1	No	ATL, BAS, CK.
Basic Orange 2	No	BAS, CK, PSC.
Basic Orange 21	No	ATL, VPC.
Basic Orange 26	No	CK.
All other basic orange dyes	No	ATL. (?)
Basic red dyes:		
Basic Red 1	No	BAS.
Basic Red 12	No	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.
Basic Red 104	No	CK.
Basic Red 111	No	S.
All other basic red dyes	No	BAS. (?)
Basic violet dyes:		
Basic Violet 1	No	BAS, DSC.
Basic Violet 3	Yes	BAS, CK, DSC.
Basic Violet 4	No	BAS, DSC.
Basic Violet 10	No	BAS.
Basic Violet 11	No	BAS.
Basic Violet 16	No	ATL, CK, VPC.
Basic Violet 35	No	BAS.
All other basic violet dye	No	BAS. (?)
Basic blue dyes:		
Basic Blue 1	No	BAS.
Basic Blue 3	No	BAS, CK.
Basic Blue 4	No	BAS.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Basic dyes (classical and modified)—Continued	Yes	
Basic blue dyes—Continued	Yes	
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 basic blue dyes, modified	No	CK.
Basic green dyes:	No	
Basic Green 4	No	BAS.
All other basic green dyes	No	BAS. (2)
Basic brown dyes:	No	
Basic Brown 2	No	PSC.
Basic Brown 4	No	BAS, PSC.
All other basic brown dyes	No	BAS.
All other basic brown dyes, modified	No	CGY.
Basic black dyes:	No	
All other basic black dyes	No	BAS. (2)
All other basic black dyes, modified	No	BAS.
Direct dyes:	Yes	
Direct yellow dyes:	Yes	
Direct Yellow 4	No	BAS, CGY, CK, LVR, VPC.
Direct Yellow 5	No	BAS.
Direct Yellow 6	No	VPC.
Direct Yellow 11	No	BAS, VPC.
Direct Yellow 34	No	CK.
Direct Yellow 44	No	CK.
Direct Yellow 50	No	CGY.
Direct Yellow 51	No	S.
Direct Yellow 105	No	CGY, CK.
Direct Yellow 108	No	CK.
Direct Yellow 107	No	CK.
Direct Yellow 118	No	CK.
Direct Yellow 119	No	VPC.
Direct Yellow 127	No	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.
Direct Yellow 148	No	S.
Direct Yellow 154	No	VPC.
Direct Yellow 166	No	CGY.
All other direct yellow dyes	No	ATL, BAS, CK.
Direct orange dyes:	Yes	
Direct Orange 15	No	BAS, CGY, VPC.
Direct Orange 26	No	CK.
Direct Orange 39	No	CK, FAB.
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	ATL, BAS.
Direct red dyes:	Yes	
Direct Red 9	No	CK.
Direct Red 16	No	ATL, CGY.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Direct dyes—Continued	Yes	
Direct red dyes—Continued	Yes	
Direct Red 24	No	ATL, FAB.
Direct Red 26	No	ATL.
Direct Red 72	No	CGY, CK.
Direct Red 73	No	ATL.
Direct Red 80	No	ATL, CK.
Direct Red 81	No	ATL, CGY, CK, FAB, LVR, VPC.
Direct Red 83	No	ATL, CK, FAB.
Direct Red 224	No	CGY, CK.
Direct Red 236	No	BAS, VPC.
Direct Red 238	No	VPC.
Direct Red 239	No	BAS, CGY, CK, S.
Direct Red 243	No	CK.
Direct Red 254	Yes	BAS, CGY, CK, VPC.
All other direct red dyes	Yes	ATL, BAS, CK, VPC.
Direct violet dyes:	No	
Direct Violet 9	No	ATL, CGY.
Direct Violet 66	No	ATL.
Direct Violet 99	No	VPC.
Direct Violet 195	No	CK.
All other direct violet dyes	No	BAS.
Direct blue dyes:	Yes	
Direct Blue 15	No	VPC.
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 120, 120:1, 120:2, and 120:3	No	FAB.
Direct Blue 160	No	CK.
Direct Blue 189	No	CK.
Direct Blue 191	No	CK.
Direct Blue 199	No	BAS, CGY, VPC.
Direct Blue 218	No	CGY, CK, FAB, VPC.
Direct Blue 261	No	S.
Direct Blue 269	No	VPC.
Direct Blue 279	No	VPC.
Direct Blue 281	No	CGY.
Direct Blue 283	No	ATL, CK.
Direct Blue 285	No	ATL.
Direct Blue 286	No	ATL.
Direct Blue 290	No	CGY.
All other direct blue dyes	Yes	ATL, BAS, FAB, VPC.
Direct green dyes:	No	
Direct Green 92	No	ATL.
All other direct green dyes	No	FAB.
Direct brown dyes:	Yes	
Direct Brown 44	No	FAB.
Direct Brown 154	No	CGY.
Direct Brown 230	No	ATL.
Direct Brown 231	No	ATL.
Direct Brown 232	No	ATL.
Direct Brown 238	No	ATL.
All other direct brown dyes	No	BAS, FAB, VPC.
Direct black dyes:	Yes	
Direct Black 22	No	ATL, CGY, CK, FAB.
Direct Black 80	No	ATL, CK, FAB.
Direct Black 163	No	S.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Direct dyes—Continued	Yes	
Direct black dyes—Continued	Yes	
Direct Black 165	No	ATL.
Direct Black 170	No	ATL.
Direct Black 179	No	CK.
All other direct black dyes	No	ATL, BAS, CK, FAB, VPC.
Disperse dyes:	Yes	
Disperse yellow dyes:	Yes	
Disperse Yellow 3	No	CGY, CK.
Disperse Yellow 23	No	ATL, CK.
Disperse Yellow 42	No	CGY, CK, S.
Disperse Yellow 54	No	BAS.
Disperse Yellow 64	No	BAS, HCL.
Disperse Yellow 77	No	VPC.
Disperse Yellow 86	No	CGY, EKT.
Disperse Yellow 88	No	EKT.
Disperse Yellow 108	No	CGY, 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 5	No	ATL.
Disperse Orange 25 and 25:1	No	ATL, CK, ICI.
Disperse Orange 29	No	CK.
Disperse Orange 30	No	ATL, BUC, CGY, CK, S, SDC.
Disperse Orange 37	Yes	ATL, CK, EKT.
Disperse Orange 41	No	CGY, CK, S.
Disperse Orange 44 and 44:1	Yes	ATL, CGY, CK, SDC.
Disperse Orange 73	No	BAS.
Disperse Orange 89	No	CK.
Disperse Orange 94	No	S.
Disperse Orange 138	No	EKT.
Disperse Orange 153	No	CK.
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.
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, S.
Disperse Red 74	No	S.
Disperse Red 88	No	EKT.
Disperse Red 91	No	BAS.
Disperse Red 117	No	EKT.
Disperse Red 135	No	CK.
Disperse Red 136	No	EKT.
Disperse Red 137	No	EKT.
Disperse Red 145	No	CK.
Disperse Red 153	No	CK, FAB, S.
Disperse Red 159	No	VPC.

See footnotes at end of table.

Section 4

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Disperse dyes—Continued	Yes	
Disperse red dyes—Continued	Yes	
Disperse Red 167 and 167:1	Yes	ATL, CGY, CK, S.
Disperse Red 177	Yes	CK, ICI, S.
Disperse Red 179	No	BAS, CK, S.
Disperse Red 263	No	BAS.
Disperse Red 273	No	S.
Disperse Red 274	No	CK, S.
Disperse Red 278	No	ICI.
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	CGY, EKT.
Disperse Red 340	No	EKT.
Disperse Red 345	No	CK.
Disperse Red 358	No	HCL.
All other disperse red dyes	Yes	BAS, CK, SDC.
Disperse violet dyes:	Yes	
Disperse Violet 1	No	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.
All other disperse violet dyes	No	CK, SDC.
Disperse blue dyes:	Yes	
Disperse Blue 3	No	CGY, CK, EKT, FAB.
Disperse Blue 7	No	CGY.
Disperse Blue 14	No	CK.
Disperse Blue 27	No	CGY, EKT.
Disperse Blue 60	No	BAS, CGY.
Disperse Blue 62	No	EKT.
Disperse Blue 64	No	EKT.
Disperse Blue 73	No	S.
Disperse Blue 77	No	CGY.
Disperse Blue 79	No	BAS, BUC, CGY, HCL, ICI.
Disperse Blue 81	No	S.
Disperse Blue 95	No	HCL.
Disperse Blue 102	No	CK, EKT.
Disperse Blue 106	No	CK.
Disperse Blue 118	No	EKT.
Disperse Blue 122	No	ICI.
Disperse Blue 148	No	BAS.
Disperse Blue 165	No	CGY, HCL.
Disperse Blue 183	No	ATL, S.
Disperse Blue 200	No	ICI.
Disperse Blue 281	No	S.
Disperse Blue 284	No	ICI.
Disperse Blue 291	No	CK, S.
Disperse Blue 317	No	CK.
Disperse Blue 333	No	HCL.
Disperse Blue 337	No	EKT.
Disperse Blue 359	No	CK.
All other disperse blue dyes	No	ATL, BAS, BUC, HCL, ICI.
Disperse green dyes:		
Disperse Green 9	No	ICI.
Disperse brown dyes:		
Disperse Brown 1	Yes	ATL, BUC, CK, S.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Disperse dyes—Continued		
Disperse brown dyes—Continued		
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 1	No	CGY.
Disperse Black 9	No	ATL, CGY, CK, EKT, FAB.
Disperse Black 33	No	CGY.
All other disperse black dyes	No	BAS, SDC.
Fiber-reactive dyes:		
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 37	No	HCL.
Reactive Yellow 42	No	HCL.
Reactive Yellow 86	No	ICI.
Reactive Yellow 125	No	S.
Reactive Yellow 135	No	ICI.
Reactive Yellow 160	No	HCL.
All other reactive yellow dyes	No	HCL.
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 16	No	ATL, CK, HCL.
Reactive Orange 20	No	CK.
Reactive Orange 72	No	CK.
Reactive Orange 78	No	HCL.
Reactive Orange 84	No	ICI.
Reactive Orange 88	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 31	No	ICI.
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	CK, ICI.
Reactive Red 141	No	ICI.
Reactive Red 147	No	S.
Reactive Red 180	No	ATL, HCL.
Reactive Red 198	No	ATL.
All other reactive red dyes	No	ATL, HCL.
Reactive violet dyes:		
Reactive Violet 1	No	ICI.
Reactive Violet 5	No	HCL.
Reactive violet 33	No	S.
All other reactive violet dyes	No	CGY, HCL, ICI.
Reactive blue dyes:		
Reactive Blue 3	No	ICI.
Reactive Blue 4	No	CK, ICI.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Fiber-reactive dyes—Continued	Yes	
Reactive blue dyes—Continued	No	
Reactive Blue 5	No	ICI.
Reactive Blue 7	No	CGY, CK.
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 50	No	CGY.
Reactive Blue 71	No	ICI.
Reactive Blue 89	No	HCL, 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.
All other reactive brown dyes	No	HCL.
Reactive black dyes:		
Reactive Black 5	Yes	ATL, CK, HCL.
Reactive Black 9	No	ICI.
All other reactive black dyes	No	HCL.
Fluorescent brighteners:	Yes	
Fluorescent Brightener 6	No	VPC.
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	BAS.
Fluorescent Brightener 71	No	CGY, VPC.
Fluorescent Brightener 102	No	CGY.
Fluorescent Brightener 128	No	HIL.
Fluorescent Brightener 130	No	BAS.
Fluorescent Brightener 134	No	CGY.
Fluorescent Brightener 205	No	VPC.
Fluorescent Brightener 220	No	S.
Fluorescent Brightener 235	No	S.
All other fluorescent brighteners	No	CGY, S, VPC.(²)
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	No	WJ.
Food, Drug, and Cosmetic Red 3	No	HIL, STG, WJ.
Food, Drug, and Cosmetic Red 4	No	CK.
Food, Drug, and Cosmetic Red 40	No	HIL, STG, WJ.
Food, Drug, and Cosmetic Yellow 5	No	HIL, STG, WJ.
Food, Drug, and Cosmetic Yellow 6	No	CK, HIL, STG, WJ.
Drug and cosmetic dyes:	Yes	
Drug and Cosmetic Green 5	No	CK.
Drug and Cosmetic Green 8	No	HIL.
Drug and Cosmetic Orange 5	No	SNA.
Drug and Cosmetic Red 6	No	HIL, SNA.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Food, drug and cosmetic colors—Continued	Yes	
Drug and cosmetic dyes—Continued	Yes	
Drug and Cosmetic Red 7	No	HIL, SNA.
Drug and Cosmetic Red 17	No	WJ.
Drug and Cosmetic Red 21	No	SNA.
Drug and Cosmetic Red 27	No	HIL.
Drug and Cosmetic Red 30	No	SNA.
Drug and Cosmetic Red 33	No	CK, SNA.
Drug and Cosmetic Red 34	No	SNA.
Drug and Cosmetic Yellow 5	No	WJ.
Drug and Cosmetic Yellow 10	No	CK, HIL, WJ.
Drug and cosmetic dyes, external:	No	
External Drug and Cosmetic Orange 3	No	CK.
Mordant dyes:	Yes	
Mordant yellow dyes:	No	
Mordant Yellow 20	No	FAB.
Mordant orange dyes:	No	
Mordant Orange 1	No	FAB.
Mordant Orange 6	No	ATL, FAB.
All other mordant orange dyes	No	FAB.
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	BAS, MRT.
Solvent Yellow 40	No	CK.
Solvent Yellow 42	No	ATL, CK.
Solvent Yellow 43	No	DGO, HCL, MRT.
Solvent Yellow 47	No	(²).
Solvent Yellow 56	No	PSC.
Solvent Yellow 72	No	CIC, FAB, PSC.
Solvent Yellow 94	No	HIL.
Solvent Yellow 107	No	MRT.
Solvent Yellow 131	No	DGO.
Solvent Yellow 135	No	(²).
Solvent Yellow 143	No	MRT.
Solvent Yellow 160	No	(²).
Solvent Yellow 161	No	MRT.
Solvent Yellow 167	No	CIC.
All other solvent yellow dyes	No	ATL, MIL, MRT, (²)
Solvent orange dyes:	Yes	
Solvent Orange 2	No	PSC.
Solvent Orange 3	No	BAS, PSC.
Solvent Orange 7	No	ATL, PSC.
Solvent Orange 20	No	BAS, FAB.
Solvent Orange 23	No	CK.
Solvent Orange 25	No	ATL.
Solvent Orange 31	No	PSC.
Solvent Orange 60	No	CIC.
Solvent Orange 77	No	MRT.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Solvent dyes—Continued	Yes	
Solvent orange dyes—Continued	Yes	
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 49	No	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 175	No	MRT.
Solvent Red 207	No	MRT.
Solvent Red 208	No	MRT.
Solvent Red 222	No	CIC.
All other solvent red dyes	No	CIC, MIL, PSC.
Solvent violet dyes:	No	
Solvent Violet 8	No	BAS, DSC.
Solvent violet 11	No	CK.
Solvent Violet 13	No	CK, DSC, MRT.
Solvent Violet 14	No	MRT.
Solvent Violet 38	No	MRT.
All other solvent violet dyes	No	MIL.
Solvent blue dyes:	Yes	
Solvent Blue 3	No	PSG.
Solvent Blue 5	No	DSC.
Solvent Blue 23	No	BAS.
Solvent Blue 35	No	MRT.
Solvent Blue 36	No	MRT.
Solvent Blue 38	No	ATL, TNI.
Solvent Blue 43	No	ATL.
Solvent Blue 58	No	VPC.
Solvent Blue 59	No	MRT, VPC.
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 129	No	MRT.
All other solvent blue dyes	No	MIL.
Solvent green dyes:	No	
Solvent Green 3	No	CK, MRT.
Solvent brown dyes:		
Solvent Brown 12	No	PSC.
Solvent Brown 20	No	ATL.
Solvent Brown 22	No	PSC.
Solvent Brown 52	No	MRT.
Solvent black dyes:	No	
Solvent Black 5	No	LVR.
Solvent Black 7	No	BAS, OCC, PSC.
Solvent Black 13	No	ATL, CK.
Solvent Black 26	No	ATL, FAB.
Solvent Black 46	No	MRT.
Solvent Black 47	No	MRT.
Solvent Black 49	No	MRT.

See footnotes at end of table.

Table 4-2--Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Sulfur dyes:	No	
Sulfur yellow dyes:	No	
Leuco Sulfur Yellow 22	No	SDC.
All other sulfur yellow dyes	No	SDC.
Sulfur orange dyes:	No	
All other sulfur orange dyes	No	SDC.
Sulfur red dyes:	No	
Leuco Sulfur Red 14	No	SDC.
Sulfur Red 10	No	SDC.
Sulfur blue dyes:	No	
Leuco Sulfur Blue 7	No	S, SDC.
Leuco Sulfur Blue 11	No	SDC.
Sulfur green dyes:	No	
Leuco Sulfur Green 2	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:	No	
Leuco Sulfur Brown 1, 1:1	No	SDC.
Leuco Sulfur Brown 3	No	SDC.
Leuco Sulfur Brown 37	No	SDC.
Leuco Sulfur Brown 52	No	SDC.
Sulfur brown dyes:	No	
Leuco Sulfur Brown 96	No	S.
All other sulfur brown dyes	No	SDC.
Sulfur black dyes:	No	
Leuco Sulfur Black 1	No	SDC.
Leuco Sulfur Black 2	No	SDC.
Leuco Sulfur Black 11, 11:1	No	SDC.
Leuco Sulfur Black 18	No	SDC.
Solubilized Sulfur Black 2	No	S, SDC.
Sulfur Black 1	No	BRR.
Sulfur Black 11, 11:1	No	SDC.
Vat dyes:	Yes	
Vat yellow dyes:	Yes	
Vat Yellow 2, 8-1/2%	No	BRR.
Vat Yellow 33, 15%	No	CGY.
Vat orange dyes:	Yes	
Vat Orange 1, 20%	No	CGY, SDC.
Vat Orange 2, 12%	No	BAS.
Vat Orange 7, 11%	No	HCL.
Vat Orange 9, 12%	No	BAS.
Vat red dyes:	Yes	
Vat Red 1, 13%	No	BAS.
Vat Red 10, 18%	No	BAS, CGY.
Vat Red 13, 11%	No	CGY.
Vat Red 15, 10%	No	HCL.
All other vat red dyes	No	HCL.
Vat violet dyes:	Yes	
Vat Violet 1, 11%	No	BRR, CGY.
Vat Violet 13, 6-1/4%	No	BAS, SDC.
Vat blue dyes:	Yes	
Vat Blue 1, 20%	No	BCC, PSC.
Vat Blue 6, 8-1/3%	No	BAS, CGY.
Vat Blue 16, 16%	No	BAS, BUC, CGY.
Vat Blue 18, 13%	No	CGY.
Vat Blue 19	No	BAS.
Vat Blue 20, 14%	No	BRR, CGY, SDC.
Vat Blue 29	No	BAS.

See footnotes at end of table.

Table 4-2—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Dyes	Separate statistics ¹	Manufacturers' identification codes (according to list in table 4-3)
Vat dyes—Continued	Yes	
Vat blue dyes—Continued	Yes	
Vat Blue 43	No	S, SDC.
Vat Blue 66	No	BAS.
Vat green dyes:	Yes	
Vat Green 1, 6%	No	BAS, CGY, SDC.
Vat Green 3, 10%	Yes	BAS, BRR, SDC.
Vat Green 7	No	SDC.
All other vat green dyes	No	BRR.
Vat brown dyes:	Yes	
Vat Brown 1, 11%	No	BRR, CGY.
Vat Brown 11, 12%	No	CGY.
Vat Brown 13, 17%	No	CGY.
Vat Brown 57, 12.8%	No	CGY, HCL.
All other vat brown dyes	No	BRR.
Vat black dyes:	Yes	
Vat Black 16	No	BRR, CGY.
Vat Black 22, 19%	No	CGY.
Vat Black 25, 12-1/2%	No	BAS, CGY, SDC.
All other vat black dyes	No	BRR, SDC.
Miscellaneous dyes:		
All other dyes	Yes	BRR, DAN, MIL, MRT, SDC.

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 4-3

Dyes: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ALL	Alliance Chemical, Inc.	ICI	ICI Americas, Inc., Specialty Chem Div.
ATL	Atlantic Industries, Inc.	LVR	C. Lever Co., Inc.
BAS	BASF Corp.	MIL	Milliken & Co., Milliken Chemical Div.
BCC	Buffalo Color Corp.	MRT	Morton International, Inc., Specialty Chemicals
BRR	Burris 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, Inc., PMC Specialties Group, Inc.
CK	Crompton & Knowles Corp.	S	Sandoz Chemical Corp.,
DAN	Dan River, Inc., Chemical Products Div.	SDC	Colors & Chemicals Div.
DGO	Day-Glo Color Corp.	SNA	Sun Chemical Corp., Pigments Div.
DSC	Dye Specialties, Inc.	STG	McCormick & Co., Inc., McCormick/Strange Flavor Div.
EKT	Eastman Kodak Co., Tennessee Eastman Co. Div.	TNI	Gillette Co., Chemical Div.
FAB	Fabricolor Manufacturing Corp.	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
HCL	Hoechst Celanese Corp.: Sou-Tax Works Specialty Chem Group	WJ	Warner-Jenkinson Co.
HIL	Hilton Davis Company		

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 questionnaire 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 1989 are given in table 5-1. 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 1989 was 50 million kilograms, 4 percent less than the 53 million kilograms produced in 1988. Total sales of organic pigments in 1989 amounted to 43 million kilograms, valued at \$702 million, compared with 39 million kilograms, valued at \$595 million, in 1988. In terms of quantity, sales of organic pigments in 1989 were 10 percent higher than in 1988; in terms of value, sales in 1989 were 18 percent higher than in 1988. Changes in U.S. production of pigments have followed overall changes in U.S. economic activity during 1985-89 (see figure 5-1).

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 1989 amounted to 50 million kilograms, 4 percent less than the 52 million pounds reported in 1988. Sales in 1989 were 43 million kilograms, valued at \$702 million, compared with 39 million kilograms valued at \$591 million, in 1988. In terms of quantity, sales of toners in 1989 were 10 percent higher than in 1988; in terms of value, sales were 18 percent higher in 1989 than in 1988. The individual toners listed in the report which were produced in the largest quantities in 1989 were Pigment Yellow 12, Pigment Yellow 14, Pigment Red 48:1 barium toner, Pigment Red 49:1 barium toner, Pigment Red 53:1 barium toner, Pigment Red 57:1, calcium toner, Pigment Violet 19, Pigment Blue 15:3, beta form, and Pigment Green 7.

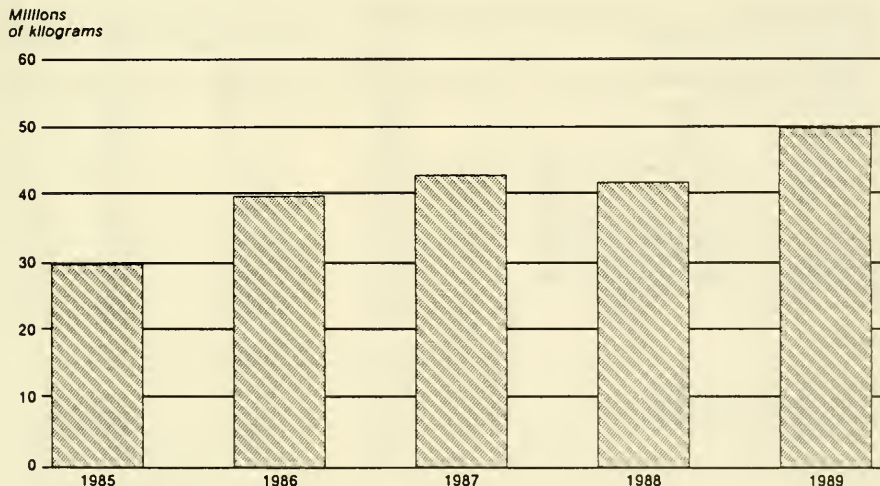
Production of lakes totaled 307,000 kilograms in 1989, 9 percent lower than the 336,000 pounds reported for 1988. Sales of lakes in 1989 amounted to 256,000 kilograms, valued at \$4.4 million. In terms of quantity, sales of lakes in 1989 were 7 percent lower than in 1988; in terms of value, sales in 1989 were 7 percent higher lower than in 1988.

Table 5-2 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 5-3.

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Figure 5-1
Organic pigments: U.S. production, 1985-89



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

Section 5

Table 5-1

Organic pigments: U.S. production and sales, 1989

Organic pigments	Production	Sales		Average Unit value ²
		Quantity	Value ¹	
	1,000 Kilograms dry basis ³	1,000 Kilograms dry basis ³	1,000 dollars	Per kilogram
Grand Total	50,360	43,236	701,552	\$16.23
Toners				
Total	50,053	42,980	697,145	16.20
Yellow toners, total	13,122	10,750	133,756	12.44
Acetoacetarylide yellows:				
Pigment Yellow 3, C.I. 11 710	30	36	476	13.34
Pigment Yellow 65, C.I. 11 740	99	94	1,739	18.58
Pigment Yellow 73, C.I. 11 738	128	126	1,632	13.01
Pigment Yellow 74, C.I. 11 741	326	316	5,979	18.92
All other acetoacetarylide yellows	774	267	3,386	12.67
Diarylide yellows:				
Pigment Yellow 12, C.I. 21 090	8,192	6,468	74,695	11.55
Pigment Yellow 13, C.I. 21 100	307	307	4,296	13.98
Pigment Yellow 14, C.I. 21 095	2,372	2,283	23,968	10.50
Pigment Yellow 17, C.I. 21 105	321	308	4,632	15.05
Pigment Yellow 83, C.I. 21 108	507	485	10,668	22.01
All other yellow toners	66	60	2,285	38.08
Orange toners, total	1,303	1,174	17,312	14.75
Pigment Orange 5, C.I. 21 075	437	347	4,015	11.58
Pigment Orange 16, C.I. 21 160	410	374	4,165	11.13
Pigment Orange 46, C.I. 15 602	370	346	4,319	12.50
All other orange toners	86	107	4,813	44.98
Red toners, total	17,158	14,927	264,131	17.69
Naphthol reds, total				
Pigment Red 2, C.I. 12 310	20	16	419	26.09
Pigment Red 17, C.I. 12 390	20	5	116	21.54
Pigment Red 22, C.I. 12 315	118	112	1,863	16.69
Pigment Red 23, C.I. 12 355	153	104	2,710	26.07
All other naphthol reds	669	655	18,601	28.42
Pigment Red 3, C.I. 12 120	300	327	4,649	14.23
Pigment Red 4, C.I. 12 085	41	37	568	15.33
Pigment Red 38, C.I. 12 120	67	72	1,761	24.61
Pigment Red 48:1, barium toner, C.I. 15 865	1,108	1,123	15,625	13.92
Pigment Red 48:2, calcium toner, C.I. 15 865	704	629	8,493	13.50
Pigment Red 49:1, barium toner, C.I. 15 630	1,932	1,669	16,668	10.00
Pigment Red 49:2, calcium toner, C.I. 15 630	421	389	5,066	13.03
Pigment Red 52:1, calcium toner, C.I. 15 860	376	386	6,284	16.29
Pigment Red 53:1, barium toner, C.I. 15 585	1,160	1,141	11,663	10.22
Pigment Red 57:1, calcium toner, C.I. 15 850	7,224	5,614	67,329	11.99
Pigment Red 81, PMA, C.I. 45 160	180	170	6,532	38.38
All other red toners	2,665	2,478	95,784	38.63
Violet toners, total	2,547	2,459	85,175	34.65
Pigment Violet 1, C.I. 45 170	12	13	474	37.11
Pigment Violet 19, C.I. 46 500	1,856	1,797	55,666	30.97
Pigment Violet 23, C.I. 51 319	226	218	17,044	78.32
All other violet toners	453	431	11,991	27.87

See footnotes at end of table.

Table 5-1—Continued

Organic pigments: U.S. production and sales, 1989

Organic pigments	Production	Sales		Average Unit value ²
		Quantity	Value ¹	
	1,000 Kilograms dry basis ³	1,000 Kilograms dry basis ³	1,000 dollars	Per kilogram
Toners—Continued				
Blue toners, total	14,542	12,318	169,235	\$13.74
Pigment Blue 1, (PMA), C.I. 42 595	31	27	911	33.81
Pigment Blue 15, alpha form, C.I. 74 160	195	278	5,306	19.10
Pigment Blue 15:1, alpha form, C.I. 74 160	380	413	10,965	26.55
Pigment Blue 15:2, alpha form, C.I. 74 160	198	250	5,558	22.26
Pigment Blue 15:3, beta form, C.I. 74 160	8,017	6,753	85,366	12.64
Pigment Blue 15:4, beta form, C.I. 74 160	644	459	6,736	14.68
All other blue toners	5,077	4,138	54,393	13.14
Green toners, total	1,279	1,238	25,882	20.91
Pigment Green 7, C.I. 74 260	1,211	1,166	23,173	19.87
All other green toners	68	72	2,709	37.76
Brown and black toners,	102	114	1,654	14.51
Lakes				
Total	307	256	4,407	17.21
Pigment Red 83, C.I. 58 000	14	13	422	31.66
Pigment Violet 5:1, C.I. 58 055	31	31	732	23.61
All other lakes	262	212	3,253	15.34

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.

Table 5-2

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Organic pigments	Separate statistics ¹	Manufacturers' identification codes (according to list in table 5-3)
Toners		
Yellow toners:		
Acetoacetylrylide yellows:		
Pigment Yellow 1	No	BAS, DUP, GLX, HSH, SNA, VPC.
Pigment Yellow 2	No	KCW.
Pigment Yellow 3	Yes	HEU, HSH, KCW, SNA, VPC.
Pigment Yellow 60	No	HSH.
Pigment Yellow 65	Yes	HEU, HSH, SNA, VPC.
Pigment Yellow 73	No	HCL, HSH, SNA, VPC.
Pigment Yellow 74	Yes	BAS, HCL, HEU, HIL, HSH, IND, ROM, SNA, VPC.
Pigment Yellow 97	No	HCL.
Pigment Yellow 98	No	HCL.
Pigment Yellow 118	No	VPC.
All other acetoacetylrylide yellows	No	KCW.
Diarylide yellows:		
Pigment Yellow 12	Yes	AMS, APO, BAS, HCL, HIL, HSH, IDC, IND, POP, ROM, SNA.
Pigment Yellow 13	Yes	AMS, APO, BAS, FAB, GLX, HCL, IDC, IND, SNA.
Pigment Yellow 14	Yes	AMS, BAS, BNS, FAB, GLX, HCL, HSH, IDC, IND, ROM, SNA.
Pigment Yellow 17	Yes	AP0, BAS, FAB, GLX, HCL, HSH, IDC, IND, ROM, SNA, VPC.
Pigment Yellow 83	Yes	BAS, FAB, GLX, HCL, IDC, IND, ROM, SNA.
Pigment Yellow 124	No	GLX.
Pigment Yellow 152	No	HCL.
Yellow pigments, other:		
Pigment Yellow 139	No	VPC.
All other pigment yellow toners	No	HCL, HSH.
Orange toners:		
Pigment Orange 1	No	KCW.
Pigment Orange 2	No	UHL.
Pigment Orange 5	Yes	BAS, HCL, HIL, HSH, PCW, SNA.
Pigment Orange 13	No	GLX, HSH, IND, SNA, VPC.
Pigment Orange 15	No	BNS.
Pigment Orange 16	Yes	BNS, CGY, FAB, GLX, HSH, IND, ROM, SNA.
Pigment Orange 34	No	HCL, IND, ROM, VPC.
Pigment Orange 43	No	HCL.
Pigment Orange 46	Yes	AMS, BAS, CMC, MGR, SNA, UHL.
Pigment Orange 48	No	CGY.
Pigment Orange 49	No	CGY.
All other pigment orange toners	No	GLX.
Red toners:		
Naphthol reds:		
Pigment Red 2	Yes	GLX, HCL, HSH.
Pigment Red 5	No	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, 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 112	No	HCL, VPC.
Pigment Red 146	No	HCL.
Pigment Red 147	No	HSH.
Pigment Red 170	No	GLX, HCL.
Pigment Red 210	No	SNA.
All other naphthol reds	No	BUC, FAB, GLX, IND, KCW, ROM, (2), (2).

See footnotes at end of table.

Table 5-2—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Organic pigments	Separate statistics ¹	Manufacturers' identification codes (according to list in table 5-3)
Toners—Continued		
Red toners—Continued		
Red pigments, other:	Yes	
Pigment Red 1, (light)	No	HSH.
Pigment Red 3	Yes	BAS, CGY, HIL, HSH, KCW, SNA, UHL.
Pigment Red 4	Yes	ALE, HIL, HSH, MAX, UHL.
Pigment Red 38	Yes	HCL, HSH, SNA, VPC.
Pigment Red 41	No	VPC.
Pigment Red 48:1, (barium)	Yes	AMS, APO, BAS, CGY, CMC, FAB, HEU, HIL, HSH, MGR, MAX, SNA, UHL.
Pigment Red 48:2, (calcium)	Yes	AMS, APO, BAS, CMC, FAB, HIL, HSH, MGR, MAX, SNA, UHL, VPC.
Pigment Red 48:3, (strontium)	No	CGY, HEU, HSH.
Pigment Red 48:4, (manganese)	No	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, BNS, CMC, HIL, IDC, MGR, SNA, UHL.
Pigment Red 52:1, (calcium)	Yes	BAS, HSH, MGR, SNA, UHL.
Pigment Red 52:2, (manganese)	No	BAS, HSH, UHL.
Pigment Red 53, (sodium)	No	MGR.
Pigment Red 53:1, (barium)	Yes	AMS, APO, BAS, CMC, FAB, HCL, HIL, HSH, IDC, MAX, SNA, UHL.
Pigment Red 57	No	BNS.
Pigment Red 57:1, (calcium)	Yes	AMS, APO, BAS, BNS, CGY, CMC, FAB, HEU, HIL, HSH, IDC, MGR, POP, PS, SNA, UHL.
Pigment Red 63	No	HSH.
Pigment Red 63:1, calcium	No	SNA.
Pigment Red 81, (PMA)	Yes	BAS, MGR, MAX, SNA, UHL.
Pigment Red 81, (PTA)	No	BAS, MGR, MAX, UHL.
Pigment Red 88	No	VPC.
Pigment Red 101	No	BAS.
Pigment Red 122	No	SNA, VPC.
Pigment Red 123	No	VPC.
Pigment Red 168	No	VPC.
Pigment Red 169	No	MAX.
Pigment Red 179	No	SNA, VPC.
Pigment Red 188	No	HCL.
Pigment Red 190	No	VPC.
Pigment Red 200	No	BAS.
Pigment Red 202	No	CGY, SNA, VPC.
Pigment Red 206	No	CGY.
Pigment Red 207	No	CGY.
Pigment Red 209	No	SNA.
Pigment Red 224	No	VPC.
Pigment Red 245	No	IND.
All other pigment red toners	No	HCL.
Violet toners:		
Pigment Violet 1, (fugitive)	No	KCW, UHL.
Pigment Violet 1, (PMA)	Yes	MGR, MAX, UHL.
Pigment Violet 1, (PTA)	No	MGR, SNA, UHL.
Pigment Violet 3, (fugitive)	No	KCW, MGR, UHL.
Pigment Violet 3, (PMA)	No	BAS, HIL, MGR, MAX, UHL.
Pigment Violet 3, (PTA)	No	MAX, UHL.
Pigment Violet 4, (fugitive)	No	KCW.
Pigment Violet 19.	Yes	CGY, SNA, VPC.
Pigment Violet 23.	Yes	HCL, IPP, SNA, VPC.
Pigment Violet 27	No	MAX.
Pigment Violet 29	No	SNA, VPC.
Pigment Violet 39, (PMA)	No	BAS.
Pigment Violet 42	No	CGY.
All other pigment violet toners	No	BUC. (?)

See footnotes at end of table.

Table 5-2 —Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Organic pigments	Separate statistics ¹	Manufacturers' identification codes (according to list in table 5-3)
Toners—Continued		
Blue toners:		
(Basic Blue 7)	No	KCW.
Pigment Blue 1, (PMA)	Yes	BNS, HIL, MGR, MAX, UHL.
Pigment Blue 1, (PTA)	No	MAX.
Pigment Blue 2, (PMA)	No	UHL.
Pigment Blue 14, (PMA)	No	BAS, UHL.
Pigment Blue 15, (alpha form)	Yes	BAS, CGY, FAB, HEU, HSH, SNA.
Pigment Blue 15:1, (alpha form)	Yes	CGY, HEU, HIL, SNA, VPC.
Pigment Blue 15:2, (alpha form)	Yes	CGY, DUP, HEU, HIL, SNA, VPC.
Pigment Blue 15:3, (beta form)	Yes	AMS, APO, BAS, CGY, CIK, CMC, HEU, HIL, IDC, IPP, MGR, POP, PS, ROM, SNA, VPC.
Pigment Blue 15:4, (beta 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	MAX.
All other pigment blue toners	No	FAB.
Green toners:		
Pigment Green 1, (PMA)	No	MAX, UHL.
Pigment Green 2, (PTA)	No	MAX, UHL.
Pigment Green 4, (fugitive)	No	UHL.
Pigment Green 4, (PMA)	No	UHL.
Pigment Green 7	Yes	ALG, BAS, CGY, HCL, HIL, MGR, POP, SNA, VPC.
Pigment Green 8	No	KCW.
Pigment Green 10	No	HEU.
Pigment Green 36	No	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	HCL, UHL.
Lakes:		
Yellow lakes:		
(Acid Yellow 1)	No	KCW.
(Acid Yellow 23)	No	MAX.
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, MAX, SNA.
Pigment Red 83	Yes	HSH, MAX, UHL.
Violet lakes:		
(Basic Violet 1)	No	BNS.
(Basic Violet 3, PMA)	No	LVR.
(Basic Violet 4)	No	BNS.
(Basic Violet 10)	No	BNS.
Pigment Violet 5:1	Yes	HSH, MAX, UHL, VPC.
Blue lakes:		
(Basic Blue 14, PMA)	No	LVR.
(Basic Blue 1, PTA)	No	LVR.

See footnote at end of table.

Table 5-2 —Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Organic pigments	Separate statistics ¹	Manufacturers' identification codes (according to list in table 5-3)
Lakes—Continued		
Green lakes:		
(Acid Green 3)	No	KCW.
(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 5-3

Organic pigments: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
ALE	Alex Chemical Co.	HIL	Hilton Davis Company
ALG	Allegheny Chemical Corp.	HSH	Engelhard Corporation
AMS	Rldgway Color Co.	IDC	Industrial Color, Inc.
APO	Apollo Colors, Inc.	IND	Indol Color Co., Inc.
BAS	BASF Corp.	IPP	Spectrachim Corp.
BNS	Binney and Smith, Inc.	KCW	Keystone Color Works, Inc.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	LVR	C. Lever Co., Inc.
CGY	Ciba-Gelgy Corp.	MAX	Max Marx Color Corp.
CIK	Flint Ink Corp., Cal/Ink Div.	MGR	Magruder Color Co., Inc.
CMC	Chromatic Color Corp.	PCW	Pfister Chemical, Inc.
DUP	E.I. duPont de Nemours & Co., Inc., Chemicals and Pigments Dept.	POP	Dalcolor-Pope, Inc.
FAB	Fabricolor Manufacturing Corp.	PS	CPS Corp.
GLX	Galaxie Chemical Corp.	PSG	PMC, Inc. Specialties Group, Inc.
HCL	Hoechst Celanese Corp.: Sou-Tex Works	ROM	Roma Color, Inc.
	Specialty Chem Group	SNA	Sun Chemical Corp., Pigment Div.
HEU	Cookeon Pigment, Inc.	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 1985-89 are shown in figure 6-1.

Table 6-1 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

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.

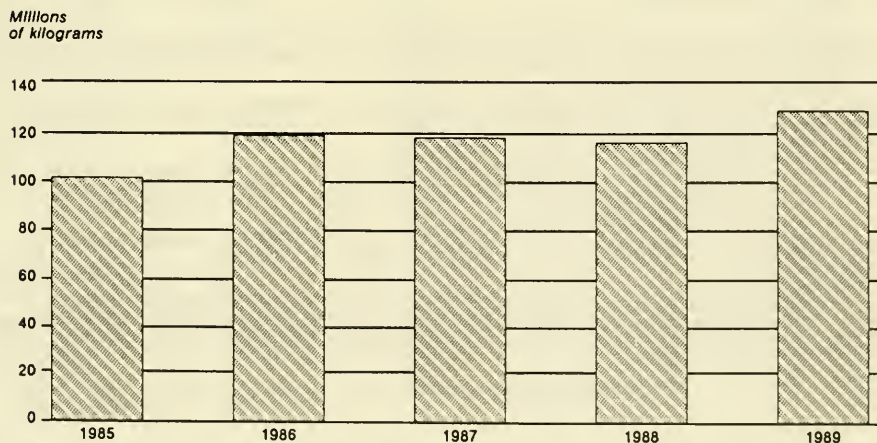
pharmaceutical products by the primary manufacturer. In some instances, the difference may also include quantities for medicinal grade products used as intermediates; for example, penicillin V used as an intermediate in the manufacture of other antibiotics. All quantities are given in terms of 100 percent content of the pure bulk drug. Table 6-2 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 6-3.

Total U.S. production of bulk medicinal chemicals in 1989 amounted to 130.3 million kilograms. Total sales of bulk medicinal chemicals in 1989 amounted to 203.6 million kilograms, valued at \$1,987.5 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 1989 was as follows (see table 6-1): Antibiotics, 17.6 million kilograms, 34 percent higher than in 1988; anti-infective agents other than antibiotics, 8.9 million kilograms, 3 percent higher than in 1988; central nervous system depressants and stimulants, 34.3 million kilograms, 53 percent higher than in 1988; gastrointestinal agents and therapeutic nutrients, 34.4 million kilograms, 24 percent lower than in 1988; and vitamins, 19.9 kilograms, 14 percent higher than in 1988.

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Figure 6-1
Medicinal Chemicals: U.S. production, 1985-89



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

Section 6

Table 6-1

Medicinal chemicals: U.S. production and sales, 1989

Medicinal chemicals	Production ¹	Sales		Average Unit value ²
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	130,326	203,613	1,987,519	\$9.76
Acyclic	34,654	50,447	205,486	4.07
Benzenoid ³	63,402	134,664	889,795	6.61
Cyclic nonbenzenoid ⁴	32,270	18,502	892,238	48.22
Antibiotics	17,645	105,047	606,524	5.77
Antihistamines	190	152	7,276	47.87
Anti-infective agents (except antibiotics), total	8,902	6,301	42,042	6.67
Anthelmintics	4,152	2,634	4,800	1.82
All other anti-infective agents (except antibiotics) ⁵	4,750	3,667	37,242	10.16
Central depressants and stimulants, total	34,331	24,542	381,026	15.53
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents, total	31,452	23,325	164,829	7.07
Aspirin	10,201	(⁶)	(⁶)	(⁶)
All other analgesics, antipyretics, and nonhormonal anti-inflammatory agents ⁷	21,251	23,325	164,829	7.07
Antidepressants	40	7	1,795	256.43
Antitussives	214	184	45,527	247.43
All other central depressants and stimulants ⁸	2,625	1,026	168,875	164.60
Dermatological agents	5,349	2,660	5,762	2.17
Expectorants and mucolytic agents	475	430	9,336	21.71
Gastrointestinal agents and therapeutic nutrients ⁹	34,445	48,735	58,274	1.20
Vitamins ¹⁰	19,872	13,459	160,052	11.89
Miscellaneous medicinal chemicals ¹¹	9,117	2,287	717,227	313.61

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

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

⁷ Includes sales quantity and value of aspirin.

⁸ Includes production and sales of amphetamines; general anesthetics; respiratory and cerebral stimulants; skeletal muscle relaxants; tranquilizers; and anticonvulsants, hypnotics, and sedatives.

⁹ Methionine and its salts are reported in the section in Miscellaneous End-Use Chemicals and Chemical Products under amino acids.

¹⁰ Includes production and sales of vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, and vitamin K.

¹¹ Includes production and sales of antineoplastic agents, cardiovascular agents, diagnostic agents, hematological agents, renal-acting and edema-reducing agents, autonomic drugs, 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 6-2

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

<i>Medicinal chemicals</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 6-3)</i>
Antibiotics:	Yes	
Cephalosporins:	No	
Cefaclor	No	LIL.
Cefamandole	No	LIL.
Cefazolin, sodium	No	LIL.
Cefoxitin	No	MRK.
Cephalexin	No	BOC, KAN, LIL, TRD.
Cephalothin, sodium	No	LIL.
Cephradine	No	KAN, SK, TRD.
Penicillins, semisynthetic:	No	
Amoxicillin:	No	
Amoxicillin (trihydrate)	No	BEE, BOC, KAN.
Amoxicillin (anhydrous)	No	BEE, BEW, BRS.
Ampicillin:	No	
Ampicillin (trihydrate)	No	BEW, BOC, BRS, KAN.
Other semisynthetic penicillins:	No	
Ampicillin, sodium	No	BEE, BEW, WYT.
Carbenicillin, disodium	No	BEW.
Cloxacillin, sodium	No	BEE, BEW.
Dicloxacillin, sodium	No	BEE, BEW, BOC, WYT.
Floxacin	No	BEW.
Hetacillin, potassium	No	BRS.
Nafcillin, sodium	No	WYT.
Oxacillin, sodium	No	BEE, BOC.
Piperacillin	No	BRS.
Ticarcillin, disodium	No	BEE, BEW.
All other semisynthetic penicillins	No	BEE.
Penicillins (except semisynthetic):	No	
For medicinal use:	No	
Penicillin V	No	BRS.
Penicillin G, benzathine	No	WYT.
Penicillin G, potassium	No	PFZ.
Penicillin V, potassium	No	BRS, LIL.
Penicillin G, procaine (medicinal grade)	No	PFZ, WYT.
For nonmedicinal uses:	No	
Penicillin G, procaine (animal feed grade)	No	PFZ.
Tetracyclines:	No	
For medicinal use:	No	
Chlortetracycline (medicinal grade)	No	ACY.
Demeclocycline	No	ACY.
Minocycline	No	ACY.
Oxytetracycline (medicinal grade)	No	PFZ.
Tetracycline	No	ACY.
For nonmedicinal uses:	No	
Chlortetracycline (animal feed grade)	No	ACY, PFZ.
Oxytetracycline (animal feed grade)	No	PFZ.
Other antibiotics:	No	
For medicinal use:	No	
Antifungal antibiotics:	No	
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	
Aztreonam	No	TRD.
Cefonicid	No	SK.
Cefuroxime	No	LIL.
Clindamycin	No	ABB, UPJ.
Erythromycin	No	ABB, ANG, UPJ.
Erythromycin estolate	No	LIL, UPJ.

¹ footnotes at end of table.

Table 6-2—Continued

Medical chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Antibiotic—Continued	Yes	
Other antibiotics—Continued	No	
For medicinal use—Continued	No	
Other antibiotics for medicinal use—Continued	No	
Erythromycin stearate	No	UPJ.
Erythromycin succinate	No	ANG.
Erythromycin thioyanate	No	ANG.
Gentamycin	No	SCH.
Imipenem	No	MRK.
Kanamycin	No	BRS.
Lincomycin (medicinal grade)	No	UPJ.
Moxalactam	No	LIL.
Neomycin (medicinal grade)	No	UPJ.
Netilmicin	No	SCH.
Novoblocin, 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:	No	
Bacitracin (animal feed grade)	No	IMC.
Cycloheximide	No	UPJ.
Efrotomycin	No	MRK.
Hygromycin B	No	LIL.
Lasalocid, sodium	No	HOF.
Lincomycin (animal feed grade)	No	UPJ.
Monesin	No	LIL.
Neomycin (animal feed grade)	No	PFZ, UPJ.
Spectinomycin (animal feed grade)	No	UPJ.
Streptomycin	No	PFZ.
Tylosin	No	LIL.
Antihistamines:	Yes	
Antinauseants:	No	
Dimenhydrinate	No	GAN.
Meclizine hydrochloride	No	PFZ.
Metoclopramide hydrochloride	No	LLI.
Other antihistamines:	No	
Brompheniramine maleate	No	LLI.
Chlorpheniramine	No	SK, UPJ.
Chlorpheniramine maleate	No	SK.
Chlorpheniramine tannate	No	CHL.
Cyproheptadine hydrochloride	No	MRK.
Dexbrompheniramine maleate	No	(*)
Dimethindene maleate	No	CGY.
Diphenhydramine citrate	No	WYK.
Diphenhydramine hydrochloride	No	PD, WYK.
Doxylamine succinate	No	BKC, MAL.
Phenindamine tartrate	No	HOF.
Phenyltoloxamine citrate	No	GAN.
Tripeleannamine	No	CGY.
Tripeleannamine citrate	No	CGY.
Tripeleannamine hydrochloride	No	CGY.
Triprolidine hydrochloride	No	AMD, BUR.
Anti-infective agents (except antibiotics):	Yes	
Anthelmintics:	Yes	
Clorsulon	No	MRK.
Dichlorvos	No	CHL.
Diethylcarbamazine citrate	No	SK.
Ivermectin	No	MRK.
Piperazine	No	TX, UCC.

See footnotes at end of table.

Table 5-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Anti-infective agents (except antibiotics)—Continued	Yes	
Anthelmintics—Continued	Yes	
Piperazine dihydrochloride	No	FLM.
Piperazine hexahydrate	No	BRS.
Piperazine hydrochloride	No	FLM.
Piperazine sulfate	No	FLM.
Thiabendazole	No	MRK.
Antiprotozoan agents:	No	
Arsenic and bismuth compounds:	No	
Arsenic acid	No	FLM.
Bismuth subsalicylate	No	MAL.
Nitarsone	No	SAL.
Roxarsone	No	SAL.
Roxarsone, sodium	No	SAL.
Other antiprotozoan agents:	No	
Amprolium	No	MRK.
Dinitolmide	No	SAL.
Ethopabate	No	MRK.
Florfenicol	No	SCH.
Hydroxychloroquine sulfate	No	SD.
Iodochlorhydroxyquin	No	CGY.
Metronidazole	No	SRL.
Sulfonamides:	No	
Mafenide	No	SDW.
Mafenide acetate	No	SDW.
Sulfabenzamide	No	ACY.
Sulfacetamide, sodium	No	SCH.
Sulfadiazine	No	ACY.
Sulfadiazine, silver	No	BOT. LEM.
Sulfadimethoxine	No	HOF.
Sulfamethazine	No	SAL.
Sulfamethazine, sodium	No	SAL.
Sulfamethizole	No	ACY.
Sulfamethoxazole	No	HOF.
Sulfasalazine	No	SAL.
Sulfathiazole, sodium	No	SAL.
Sulfisoxazole	No	HOF.
Sulfisoxazole, acetyl	No	HOF.
Urinary antiseptics:	No	
Methanamine	No	ARN.
Methanamine mandelate	No	ARN. PD.
Other anti-infective agents:	Yes	
Antifungal agents:	No	
Benzolic acid	No	KLM.
Calcium undecylenate	No	RCN.
Fluconazole	No	PFZ.
Flucytosine	No	HOF.
Sodium caprylate	No	LEM.
Zinc undecylenate	No	RCN.
All other antifungal agents	No	ARN.
Antileprotic and antitubercular agents:	No	
Aminosallylic acid	No	HXL.
Sulfoxone, sodium	No	ABB.
Antiviral agents:	No	
Acyclovir	No	BUR.
Azidothymidine	No	BUR.
General antiseptics and antibacterial agents:	No	
Bromchloronone	No	MHI.
Capreomycin	No	LIL.
Ceftazidime	No	BRS. LIL.
Cetylpyridinium chloride	No	HXL.
Cinoxacin	No	LIL.

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Anti-infective agents (except antibiotics)—Continued	Yes	
Other anti-infective agents—Continued	Yes	
General antiseptics and antibacterial agents—Cont	No	
m-Cresyl acetate	No	ADC.
8-Hydroxy-5-quinolinesulfonic acid	No	MRK.
Iodoform	No	MAL.
Magnesium salicylate	No	ARN.
Ormetoprim	No	HOF.
Oxyquinoline benzoate (Benoxiquine)	No	LEM.
Oxyquinoline citrate	No	LEM.
Pentamidine isethionate	No	MRX.
Povidone - Iodine	No	GAF.
Resorcinol	No	ISP.
Trimethoprim	No	BUR.
Autonomic drugs:	No	
Sympathomimetic agents:	No	
Albuterol sulfate	No	SCH.
Dobutamine	No	LIL.
Methoxyphenamine hydrochloride	No	HXL.
Naphazoline hydrochloride	No	CGY.
Phenylephrine bitartrate	No	GAN.
Phenylephrine hydrochloride	No	GAN, SDW.
Phenylpropanolamine bitartrate	No	ARS.
Phenylpropanolamine hydrochloride	No	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:	No	
Parasympatholytic quaternary ammonium compounds (except tropane derivatives):	No	
Glycopyrrolate	No	LLI.
Propantheline bromide	No	SRL.
Parasympatholytic tertiary amines (except tropane derivatives):	No	
Oxybutyrin chloride	No	ABB.
Oxyphenycyclimine hydrochloride	No	PFZ.
Parasympathomimetic agents:	No	
Bethanechol chloride	No	GAN.
Neostigmine methylsulfate	No	HOF.
Pyridostigmine bromide	No	HOF.
Sympatholytic agents:	No	
Timolol maleate	No	MRK.
Central depressants and stimulants:	Yes	
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents:	Yes	
Acetaminophen	No	MAL, MON, RDA, SDW.
Aspirin	Yes	DOW, MON, NOR, RDA, SD.
Aurothioglucoase	No	SCH.
Butorphanol tartrate	No	BRS.
Choline magnesium salicylate	No	ARN, LEM.
Choline salicylate	No	ARN.
Diflunisal	No	MRK.
Fenoprofen	No	LIL, WYK.
Fentanyl citrate	No	MRX.
Flunixin	No	SCH.
Hydromorphone hydrochloride	No	PEN.
Ibuprofen	No	TNA.
Indomethacin	No	MRK.
Ketoprofen	No	WYK.

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Central depressants and stimulants—Continued	Yes	
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents—Continued	Yes	
Meclufenamate, sodium	No	PD, WYK.
Meclufenamic acid	No	PD.
Mefenamic acid	No	PD, WYK.
Meperidine hydrochloride	No	PEN, SDW.
Methadone hydrochloride	No	MAL.
Morphine sulfate	No	MAL, PEN.
Oxycodone hydrochloride	No	DUP, MAL, PEN.
Oxycodone terephthalate	No	PEN.
Pentazocine	No	SD.
Pentazocine hydrochloride	No	SD.
Phenylbutazone	No	CGY.
Piroxicam	No	PFZ.
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.
Sulindac	No	MRK.
Anticonvulsants, hypnotics, and sedatives:	No	
Anticonvulsants (except barbiturates):	No	
Ethosuximide	No	PD.
Ethotoin	No	ABB.
Methsuximide	No	PD.
Phenytoin	No	PD.
Phenytoin, sodium	No	PD.
Valproic acid	No	ABB.
Barbiturates:	No	
Amobarbital	No	GAN.
Amobarbital, sodium	No	GAN.
Butobarbital	No	GAN.
Butobarbital, sodium	No	ABB.
Butalbital	No	GAN.
Phenobarbital	No	GAN.
Phenobarbital, sodium	No	GAN.
Poly(oxy-1,2-ethanediyloxy)- α -carboxymethyl, omega-(tridecyloxy), potassium salt	No	GAN.
Secobarbital	No	GAN.
Secobarbital, sodium	No	GAN.
Thiamylal, sodium	No	ABB, PD.
Thiopental, sodium	No	ABB.
Hypnotics and sedatives (except barbiturates):	No	
Alprazolam	No	UPJ.
Dichloralphenazone	No	ARN.
Ethchlorvynol	No	ABB.
Glutethimide	No	CGY, GAN.
Antidepressants:	Yes	
Amitriptyline hydrochloride	No	GAN, MRK.
Amoxapine	No	WYK.
Bupropion	No	BUR.
Doxepin hydrochloride	No	PFZ, SK.
Imipramine hydrochloride	No	CGY.
Maprotiline hydrochloride	No	ABB.
Nortriptyline hydrochloride	No	LIL.
Antitussives:	Yes	
Benzonatate	No	CGY, WYK.
Caramphen	No	SK.
Codeine	No	MAL, PEN.
Dextromethorphan hydrobromide	No	AMD, HOF.

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Central depressants and stimulants—Continued	Yes	
Antitussives—Continued	Yes	
Doxepin	No	SK.
Hydrocodone bitartrate	No	MAL, PEN.
Noscapine	No	MAL, PEN.
Thebaine	No	MAL, PEN.
Tranquillizers:	No	
Phenothiazine derivatives:	No	
Chlorpromazine	No	SK.
Chlorpromazine hydrochloride	No	SK.
Fluphenazine hydrochloride	No	TRD.
Perphenazine	No	SCH.
Prochlorperazine	No	SK.
Prochlorperazine maleate	No	SK.
Other tranquilizers:	No	
Diazepam	No	PEN.
Halazepam	No	SCH.
Haloperidol	No	SRL.
Hydroxyzine pamoate	No	LEM, PFZ.
Loxapine succinate	No	WYK.
Prazepam	No	PD.
Thiothixene hydrochloride	No	PFZ.
Other central depressants and stimulants:	Yes	
Amphetamines:	No	
Amphetamine	No	ARN, SK.
Amphetamine sulfate	No	ARN.
Dextroamphetamine	No	ARN.
Dextroamphetamine sulfate	No	ARN.
Methamphetamine hydrochloride	No	ARN.
General anesthetics:	No	
Enflurane	No	OH.
Isoflurane	No	OH.
Ketamine hydrochloride	No	PD.
Respiratory and cerebral stimulants:	No	
Caffeine (natural and synthetic):	No	
Caffeine, natural	No	CPR.
Caffeine, synthetic	No	PFZ.
Other respiratory and cerebral stimulants:	No	
Benzphetamine hydrochloride	No	UPJ.
Diethylpropion hydrochloride	No	GAN.
Doxapram hydrochloride	No	LLI.
Methyphenidate hydrochloride	No	CGY.
Pemoline	No	ABB.
Phendimetrazine tartrate	No	GAN.
Phentermine	No	GAN, SDW.
Skeletal muscle relaxants:	No	
Cyclobenzaprine hydrochloride	No	MRK.
Metaxalone	No	LLI.
Methocarbamol	No	ABB, LLI.
Orphenadrine citrate	No	WYK.
Succinylcholine chloride	No	ABB, BUR.
Tubocurarine	No	ABB.
Dermatological agents:	Yes	
Ammonium phenolsulfonate	No	SAL.
Bismuth subgallate	No	MAL.
Salicylic acid	No	DOW, KLM, MON.
Zinc phenolsulfonate	No	MAL, SAL.
Zinc salicylate	No	RSA.
Expectorants and mucolytic agents:	Yes	
Ethylethylenediamine dihydrochloride	No	AJY, DPW.
Guaifenesin	No	LLI, NOR.
Iodinated glycerol	No	(?).

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Gastrointestinal agents and therapeutic nutrients:	Yes	
Gastrointestinal agents:	No	
Choline chloride (all grades):	No	
Choline chloride (animal feed grade)	No	CHO, HFT, NUT.
Choline chloride (medicinal grade)	No	CHO, HFT, TMH.
Other gastrointestinal agents:	No	
Betaine hydrochloride	No	CHO, HFT, UPJ.
Calcium polycarbophil	No	DAN, LLI.
Choleretics and hydrocholeretics	No	UPJ.
Choline	No	HFT, RSA.
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.
Sucralfate	No	SK.
Therapeutic nutrients:	No	
Calcium gluceptate	No	PFN.
Copper gluconate	No	PFZ.
Magnesium gluconate	No	PFZ.
Manganese gluconate	No	PFZ.
Potassium gluconate	No	PFZ.
Zinc gluceptate	No	PFN.
Zinc gluconate	No	PFZ.
Hormones and synthetic substitutes:	No	
Anabolic agents and androgens:	No	
Fluoxymesterone	No	UPJ.
Methyltestosterone	No	(²).
Stanozolol	No	SD.
Testosterone	No	(²).
Testosterone cypionate	No	(²).
Testosterone propionate	No	(²).
Zeranol	No	IMC.
All other anabolic agents and androgens	No	(²).
Corticosteroids:	No	
Aclomethasone	No	SCH.
Betamethasone	No	SCH.
Betamethasone dipropionate	No	SCH, (²).
Betamethasone sodium phosphate	No	SCH.
Betamethasone valerate	No	SCH, (²).
Cortisone acetate	No	MRK, UPJ.
Dexamethasone	No	MRK, (²).
Dexamethasone sodium phosphate	No	(²).
Diflorasone diacetate	No	MRK, UPJ.
Fludrocortisone acetate	No	UPJ.
Fluorometholone	No	UPJ.
Halcinonide	No	TRD.
Hydrocortisone	No	UPJ.
Hydrocortisone acetate	No	UPJ.
Medrysone	No	UPJ.
Meprednisone	No	UPJ.

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Hormones and synthetic substitutes—Continued	No	
Corticosteroid—Continued	No	
Methylprednisolone	No	ABB, SCH, UPJ.
Prednisolone	No	MRK, UPJ.
Prednisolone acetate	No	UPJ.
Prednison	No	UPJ.
Triamcinolone	No	TRD, (*).
Triamcinolone acetonide	No	TRD, (*).
Triamcinolone diacetate	No	TRD, (*).
All other corticosteroids	No	(*).
Estrogens and progestogens	No	
Estrogens:	No	
Estradiol cypionate	No	UPJ.
Estrogens, conjugated	No	ORG.
Estrogens, esterified	No	ORG.
All other estrogens	No	ORG.
Progestogens:	No	
Alprostadil	No	(*).
Dinoprostone	No	UPJ.
Hydroxyprogesterone	No	CWN, UPJ.
Medroxyprogesterone acetate	No	(*).
Megestrol acetate	No	UPJ.
Melengestrol acetate	No	UPJ.
Progesterone	No	UPJ.
Synthetic hypoglycemic agents:	No	
Chlorpropamide	No	PFZ.
Glipizide	No	PFZ.
Tolazamide	No	(*).
Tolbutamide	No	UPJ.
Thyroid hormone and antithyroid agents:	No	
Methimazole	No	LIL.
Thyroglobulin	No	NEP.
Other hormones and synthetic substitutes:	No	
Calcitonin	No	ARP.
Corticotropin	No	ARP, ORG.
Danazol	No	SD.
Flutamide	No	SCH.
Glucagon	No	LIL.
Gonadorelin, acetate	No	ABB.
Humatrope	No	LIL.
Insulin	No	LIL.
Local anesthetics:	No	
Benzocaine	No	MAL, WYK.
Butamben	No	ABB, WYK.
Butamben picrate	No	ARN.
Cocaine	No	MAL.
Dibucaine	No	CGY.
Dibucaine hydrochloride	No	CGY.
Lidocaine	No	LEM, WYK.
Lidocaine hydrochloride	No	LEM, WYK.
Pramoxine hydrochloride	No	ABB.
Renal-acting and edema-reducing agents:	No	
Benzothiadiazine derivatives:	No	
Chlorothiazide	No	MRK.
Hydrochlorothiazide	No	CGY, MRK, SK.
Methyclothiazide	No	ABB.
Polythiazide	No	PFZ.
Trichlormethiazide	No	SCH.
Other renal-acting and edema-reducing agents:	No	
Acetazolamide	No	ACY.
Amiloride hydrochloride	No	MRK.
Canrenoate, potassium	No	SRL.

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Renal-acting and edema-reducing agents—Continued	No	
Other renal-acting and edema-reducing agents—Cont.	No	
Probencid	No	MRK, SAL.
Spronolactone	No	SRL.
Triamterene	No	GAN, SK.
Smooth muscle relaxants:	No	
Atracurium besylate	No	BUR.
Flavoxate hydrochloride	No	SK.
Oxtriphylline	No	PD.
Papaverine hydrochloride	No	CHT.
Vitamins:	Yes	
Vitamin A:	No	
Beta carotene (provitamin A)	No	HOF.
Tretinoin (vitamin A acid)	No	EK.
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:	No	
Niacin and derivatives:	No	
Niacin (medicinal grade)	No	RIL.
Niacinamide (medicinal grade)	No	NEP, RIL.
Pantothenic acid derivatives:	No	
Dexpanthenol	No	HOF.
Panthenol	No	HOF.
Other B-complex vitamins:	No	
Biotin	No	AMD, HOF.
Cyanocobalamin (medicinal grade)	No	MRK.
Riboflavin (animal feed grade)	No	MRK.
Riboflavin (medicinal grade)	No	HOF.
Riboflavin-5-phosphate, sodium	No	HOF.
Thiamine mononitrate	No	HOF, TKD.
Vitamin C:	No	
Ascorbic acid	No	HOF, TKD.
Calcium ascorbate	No	HOF.
Sodium ascorbate	No	HOF.
All other vitamin C	No	HOF.
Vitamin D:	No	
Ergocalciferol (vitamin D ₂)	No	VTM.
Vitamin E	No	
dl- α -tocopheryl acetate (all grades):	No	
dl- α -Tocopheryl acetate (animal feed grade)	No	BAS, HOF.
dl- α -Tocopheryl acetate (medicinal grade)	No	BAS, HOF.
Other vitamin E:	No	
d- α -Tocopherol	No	EKT, SCP.
dl- α -Tocopherol	No	HOF.
d- α -Tocopheryl acetate	No	EKT, SCP.
d- α -Tocopheryl acid succinate	No	EKT, SCP.
Poly(oxy-1,2-ethanedyl)- α -tocopheryl acetate (all grades):	No	
Other vitamin E:	No	
Miscellaneous medicinal chemicals:	Yes	
Antineoplastic agents:	No	
Azathioprine	No	BUR.
Carboplatin	No	MRX.
Cisplatin	No	BRS, MRX.
Cytarabine	No	PFN, UPJ.
Gallium nitrate	No	MRX.
Leuprolide acetate	No	ABB.
Mitomycin	No	BRS.
Procabazine hydrochloride	No	HOF.
Streptozocin	No	PFN.
Vinblastine sulfate	No	LIL.
Vincristine sulfate	No	LIL.

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Medicinal chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 6-3)
Miscellaneous medicinal chemicals—Continued	Yes	
Cardiovascular agents:	No	
Antihypertensive agents:	No	
Captopril	No	TRD.
Diazoxide	No	SCH.
Dilevalol hydrochloride	No	SCH.
Doxazosin mesylate	No	PFZ.
Hydralazine hydrochloride	No	CGY.
Lisinopril	No	MRK.
Methyldopa	No	MRK.
Metoprolol tartrate	No	CGY.
Minoxidil	No	UPJ.
Nadolol	No	TRD.
Phenoxybenzamine	No	SK.
Prazosin	No	ABB.
Sodium nitropruside	No	ABB.
Terazosin	No	ABB.
Enalapril maleate	No	MRK.
Vasodilators:	No	
Amyl nitrite	No	BUR.
Nicotinic alcohol tartrate	No	ARN.
Nifedipine	No	PFZ.
Other cardiovascular agents:	No	
Disopyramide phosphate	No	SRL.
Lovastatin	No	MRK.
Propranolol 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.
Glutamyl-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.
Dicumarol	No	ABB.
Lithium heparin	No	SPR.
Potassium warfarin	No	(?).
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.

See footnotes at end of table.

Table 6-2—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

<i>Medicinal chemicals</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 6-3)</i>
Miscellaneous medicinal chemicals—Continued	Yes	
Unclassified medicinal chemicals—Continued	No	
Sodium tetradecyl sulfate	No	MRX.
Tacrine	No	PD.
All other medicinal chemicals	No	ABB, BIB.

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 6-3

Medicinal chemicals: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	MAL	Mallinckrodt, Inc.
ACY	American Cyanamid Co.	MHI	Morton International, Inc., Ventron Div.
ADC	Anderson Development Co.	MON	Monsanto Co.
AJY	Ajay Chemicals, Inc.	MRK	Merck & Co., Inc.
AMD	Cyclo Products, Inc.	MRX	Johnson Matthey, Inc.
ANG	Angus Chemical Co.	NEP	Nepers Inc.
ARN	Arenol Chemical Corp.	NOR	Norwich Eaton Pharmaceutical, Inc.
ARP	Armour Pharmaceutical Co.	NUT	Bloproducts, Inc.
ARS	Arsynco, Inc., Sub. Div. of Aceto Corp.	OH	Anequest
BAS	BASF Corp.	ORG	Organics/LaGrange, Inc.
	Beecham, Inc.:	ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.
BEE	Beecham Laboratories Div.	PD	Parke-Davis Div. of Warner-Lambert Co.
BEW	Beecham Western Hemisphere, Inc.	PEN	Penick Corp.
BIB	Beckman Instruments, Inc., Spline Div.	PFN	Pfanstiehl Laboratories, Inc.
BKC	J. T. Baker Chemical Co.	PHR	Pharmachem Corp.
BOC	Blocraft Laboratories, Inc.	RCN	Racon, Inc.
BOT	The Boots Company	RDA	Rhone-Poulenc, Inc.
BRS	Bristol-Myers Co.	REG	Regia Chemical Co.
BUR	Burroughs Wellcome Co.	RIK	Riker Laboratories, Inc. Sub of 3M Co.
CGY	Ciba-Geigy Corp.	RIL	Reilly Industries, Inc.
CHL	Chemol Co.	RSA	R. S. A. Corp.
CHO	Ducon	SAL	Solvay Animal Health, Inc.
CHT	Chatterm, Inc.	SCH	The Schering Corp.
CPR	Certified Processing Corp.	SCP	Henkel Corp.
CWN	Upjohn Co., Fine Chemicals	SD	Sterling Drug, Inc.:
DAN	Dan River, Inc., Chemical Products Div.		Sterling Pharmaceuticals, Inc.
DOW	Dow Chemical Co.	SDW	Sterling Organics Div.
DPW	Deepwater, Inc.	SK	Smithkline Beecham Chemicals
DUP	E. I. duPont de Nemours & Co., Inc.	SPR	Scientific Protein Laboratories
	Medical Products Dept.	SRL	G. D. Searle & Co.
EK	Eastman Kodak Co.:	TKD	Takeda Chemical Product USA, Inc.
EKT	Tennessee Eastman Co. Div.	TMH	Harcros Chemicals, Inc.
FLM	Fleming Laboratories, Inc.	TNA	Ethyl Corp.
GAF	GAF Corp., Chemical Group	TRD	Bristol Myers Squibb Co.
GAN	Ganes Chemicals, Inc.	TX	Texaco Chemical Co.
HFT	Syntex Agribusiness, Inc.	UCC	Union Carbide Corp., Industrial Chemical Div.
HOF	Hoffmann-LaRoche, Inc.	UPJ	Upjohn Co.
HXL	Hexcel Corp., Hexcel Chemical Products	VTM	Vitamins, Inc.
IMC	IMC Pittman-Moore, Inc.	WYK	Wyckoff Chemical Co., Inc.
ISP	Inspec Chemical Corp.	WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.
KAN	Kanasco, LTD		
KLM	Kalama Chemical, Inc.		
LEM	Napp Chemicals, Inc.		
LIL	Eli Lilly & Co., Eli Lilly Industries, Inc.		
LLI	Lee Laboratories, 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 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 1989 amounted to 64.3 million kilograms (see figure 7-1). Sales of these materials in 1989 amounted to 38.4 million kilograms, valued at \$1,005.2 million, compared with 43.1 million kilograms, valued at \$866.1 million, in 1988. U.S. production of flavor and perfume materials in 1989 decreased by 12.5 percent from the level in 1988 while the value of sales increased by 16.1 percent.

Production of cyclic flavor and perfume materials in 1989 amounted to 38.1 million kilograms; sales amounted to 27.5 million

kilograms, valued at \$908.5 million. Individual publishable chemicals in the cyclic group produced in the greatest volume in 1989 were anethole (1.2 million kilograms), and eugenol (131 thousand kilograms).

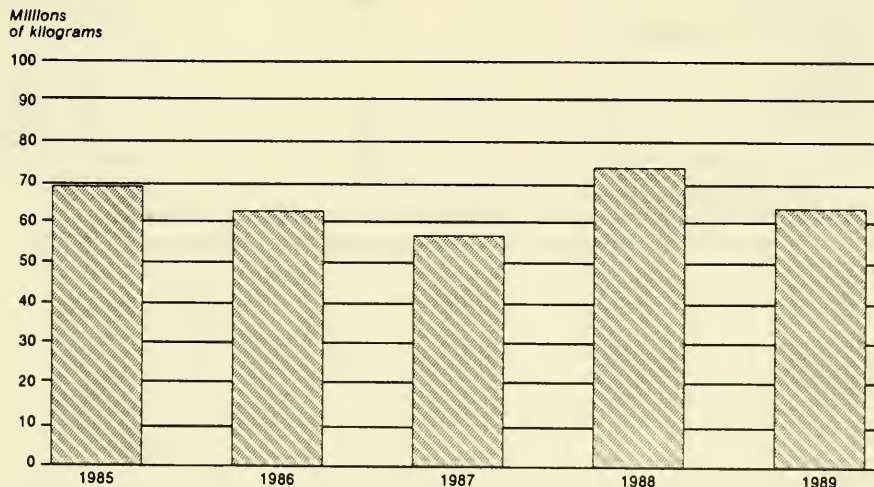
U.S. output of acyclic flavor and perfume materials in 1989 amounted to 26.2 million kilograms; sales of these materials amounted to 10.9 million kilograms, valued at \$96.8 million. Individual publishable acyclic flavor and perfume chemicals produced in the greatest volume in 1989 were geranyl acetate (93 thousand kilograms) and citronellyl acetate (30 thousand kilograms).

Table 7-2 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 7-3.

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202-252-1349

(Effective 1/14/91 202-205-3349)

Figure 7-1
Flavor and perfume materials: U.S. production, 1985-89



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

Section 7

Table 7-1

Flavor and perfume materials: U.S. production and sales, 1989

Flavor and perfume materials	Production	Sales		Average Unit value ¹
		Quantity	Value	Per kilogram
	1,000 kilograms	1,000 kilograms	1,000 dollars	
Grand total	64,324	38,420	1,005,243	\$26.16
Cyclic				
Total	38,097	27,502	908,457	33.03
Benzenoid and Naphthalenoid				
Total	29,425	21,911	839,812	38.33
4-Allyl-2-methoxyphenol (Eugenol)	131	52	356	6.85
Anisyl acetate	9	(²)	(²)	(²)
2-Ethyl hexyl salicylate	57	43	297	6.87
P-Methoxybenzyl alcohol (Anisyl alcohol)	5	5	112	20.93
Phenethyl isobutyrate	7	7	110	14.77
2-Phenethyl phenylacetate	13	8	122	14.86
p-Propenylanisole (Anethole)	1,179	1,223	11,006	9.00
All other benzenoid and naphthalenoid materials	28,024	20,573	827,809	40.24
Terpenoid, Heterocyclic, and Alicyclic				
Total	8,672	5,591	68,645	12.28
Cedryl acetate	81	55	712	12.82
gamma-Methylionone	589	326	6,657	20.44
alpha-Terpineol	1,114	863	1,798	2.08
Vetiveryl acetate	(²)	4	538	129.74
All other terpenoid, heterocyclic, and alicyclic materials	6,888	4,343	58,940	13.57
Acyclic				
Total	28,227	10,918	96,786	8.86
Citronellyl acetate	30	18	285	15.63
Citronellyl formate	8	5	105	19.92
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	10	10	124	11.91
Ethyl hexanoate	14	9	102	11.72
Geranyl formate	4	3	74	22.04
Geranyl acetate	93	85	800	9.36
Rhodinol	2	1	403	294.15
All other acyclic materials	26,066	10,787	94,893	8.80

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 7-2

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 7-3)
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, (*).
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	No	CI.
4-Allyl-2-methoxyphenol (Eugenol)	Yes	BDS, CI, ELN, FB, GIV.
α -Amyl cinnamic aldehyde	No	FB.
Amyl cinnamic aldehyde dimethyl acetal	No	FB.
Amyl cinnamyl alcohol	No	IFF.
p-Anisaldehyde	No	FB.
Anisyl acetate	Yes	ELN, FB, GIV.
Aurantol	No	BDS, FB.
Benzaldehyde glyceryl acetal	No	FB, GIV.
Benzophenone	No	CWN, PD.
Benzyl acetate	No	FB, HAR.
Benzyl benzoate	No	KLM, MRF.
Benzyl butyrate	No	ELN, FB, HAR.
Benzyl cinnamate	No	FB.
Benzyl formate	No	FB.
Benzyl isobutyrate	No	ELN.
Benzyl isopentyl ether	No	GIV.
Benzyl isovalerate	No	ELN.
1-(Benzoyloxy)-2-methoxy-4-propenylbenzene (Benzyl Isoeugenyl ether)	No	GIV.
Benzyl phenylacetate	No	ELN, GIV.
Benzyl propionate	No	ELN, FB.
Benzyl salicylate	No	FB, HAR.
p-tert-Butyl- α -methylhydrocinnamaldehyde	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.
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.
Cumyl acetate	No	IFF.
Cumyl alcohol	No	GIV.
trans-Decahydro- β -naphthol	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.
β ,4-Dimethyl-3-cyclohexene-1-propanal	No	(?).
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.
N-(p-Ethoxycarbonylphenyl)-N'-ethyl-N'-phenylformamide	No	GIV.
2-Ethoxynaphthalene	No	GIV.

See footnotes at end of table.

Section 7

Table 7-2—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 7-3)
Cyclic—Continued:		
Benzenoid and naphthalenoid—Continued		
Ethyl anthranilate	No	FB.
Ethyl cinnamate	No	ELN.
Ethyl- α , β -epoxy- β -methylhydrocinnamate	No	ELN.
2-Ethylhexyl-p-methoxy cinnamate	No	GIV.
2-Ethyl hexyl salicylate	Yes	FB, FEL, HAR.
Ethyl phenylacetate	No	ELN.
Ethyl salicylate	No	FB.
Heliotropyl acetate	No	IFF.
Heliotropyl acetone	No	AMB.
Hexahydro-5-methoxy-4,7-methano-1H-indene	No	(?)
cis-3-Hexenyl salicylate	No	BDS, IFF.
α -Hexylcinnamaldehyde	No	CI.
Hydratropaldehyde, dimethyl acetal	No	FB, IFF.
Hydrocinnamic acid	No	ELN.
Hydrocoumarin	No	ELN, GIV.
Hydroxycitronellal methyl anthranilate	No	GIV, IFF.
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	No	RDA.
3-Hydroxy-4-methoxybenzaldehyde (Iso-vanillin)	No	RDA.
4-Hydroxy-3-methoxybenzaldehyde [Vanillin]	No	RAY.
4(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillylacetone)	No	GIV.
p-Hydroxy phenylbutanone	No	GIV.
Indole	No	FB.
Isoamyl phenylacetate	No	ELN.
Isoamyl salicylate	No	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	HAR.
l-Limonene	No	SCM.
linalyl anthranilate	No	BDS.
p-Mentha-1,8-diene (Limonene)	No	IFF.
o-Methoxy benzaldehyde	No	CI.
p-Methoxybenzyl alcohol (Anisyl alcohol)	Yes	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, FB.
2-Methoxy-4-propenylphenol acetate	No	ELN.
2-Methoxy-4-propylphenol	No	CI.
4'-Methylacetophenone	No	CWN.
p-Methylanisole	No	GIV.
Methyl anthranilate	No	FB, 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.
p-Methylhydratropaldehyde	No	GIV.
3-Methylindole (Skatole)	No	GIV.
Methyl-N-methylantranilate	No	AMB.
α -Methyl-3,4-methylene dioxyhydrocinnamaldehyde	No	GIV.
Methyl phenylacetate	No	ELN, FB, GIV.
3-Methyl-5-phenyl-1-pentanol	No	IFF.
Methyl salicylate	No	KLM, MON, RDA.

See footnotes at end of table.

Table 7-2—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 7-3)
Cyclic—Continued:		
Benzenoid and naphthalenoid—Continued		
Octahydro-5-methoxy-4,7-methano-1H-Indene, 2-carboxaldehyde	No	CI.
1,1,3,3,5-Pentamethyl-4,6-dinitroindan (Moskene)	No	GIV.
α -Pentylcinnamaldehyde	No	CI.
Phenethyl acetate	No	FB, IFF.
Phenethyl alcohol	No	FB, IFF.
Phenethyl formate	No	ELN.
Phenethyl isobutyrate	Yes	ELN, FB, GIV, IFF.
Phenethyl isovalerate	No	ELN.
2-Phenethyl phenylacetate	Yes	BDS, ELN, FB, GIV, IFF.
Phenethyl propionate	No	ELN.
Phenethyl salicylate	No	GIV.
2-Phenoxyethyl isobutyrate	No	FB, IFF.
Phenylacetaldehyde	No	GIV, (2).
Phenylacetaldehyde, dimethyl acetal	No	CI.
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.
Phenylethyl 2-methyl butyrate	No	SCM.
Phenylethyl tiglate	No	FB.
3-Phenyl-1-propanol (Hydrocinnamic alcohol)	No	FB.
3-Phenylpropyl acetate	No	ELN, GIV.
3-Phenylpropyl cinnamate	No	FB.
Piperonal (Heliotropin)	No	AMB.
p-Propenylanisole (Anethole)	Yes	ARZ, FB, NCI, SCM.
p-Propylanisol (Dihydroanethole)	No	GIV.
p-Tolualdehyde	No	GIV.
p-Tolylacetaldehyde	No	GIV.
p-Tolyl acetate	No	ELN.
p-Tolyl isobutyrate	No	IFF.
p-Tolyl octanoate	No	IFF.
p-Tolylphenylacetate	No	GIV.
Trimethyl benzyl dioxane	No	IFF.
Trimethylcyclohexyl salicylate	No	ARS.
Sweeteners, synthetic:		
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.
Tetramethyl, octahydro acetophenone	No	IFF.
Tetramethyl octahydro acetyl naphthalene	No	IFF.
All other synthetic sweetener material	No	NSW.
All other benzenoid or naphthalenoid chemicals	No	FB, IFF.
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.
Acetyl methyl anthranilate	No	AMB.
Acetyl propionyl (2,3-Pentanedione)	No	FB.
Allo-ocimene	No	SCM, (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.

See footnotes at end of table.

Table 7-2—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 7-3)
Cyclic—Continued:		
Terpenoid, heterocyclic, and alicyclic—Continued		
o-tert-Butylcyclohexyl acetate	No	CI, IFF.
p-tert-Butylcyclohexyl acetate (Verbenlax)	No	IFF.
Canrenoate, potassium	No	IFF.
l-Carvone	No	SCM.
β -Caryophyllene	No	BDS, GIV, SCM.
Cedarwood acetate	No	IFF.
α -Cedrene epoxide (Andrane)	No	BDS.
Cedrenol	No	ELN, IFF.
Cedrol	No	ELN, IFF.
Cedryl acetate	Yes	BDS, ELN, IFF.
Cedryl formate	No	IFF.
Dihydro-Cyclacet	No	IFF.
Dihydronordicyclopentadienyl acetate (Cyclacet)	No	CI.
Dihydronordicyclopentadienyl propionate (Cyclaprop) (Verdyl propionate extra)	No	CI.
Dihydro terpineol	No	NCI, SCM.
Dimethyl- α -ionone	No	FB.
Dimethyl cyclohexane methanol	No	IFF.
2, 6-Dimethylheptan-2-ol	No	GIV.
Ethyl furoate	No	IFF, SCM.
Fenchol	No	SCM.
Galaxolide (1, 3, 4, 6, 7, 8-Hexahydro-4, 6, 6, 7, 8, 8-hexamethyl-cyclopenta- γ -2-benzopyran)	No	IFF.
Gualacwood acetate	No	ELN, FB.
Gualene	No	FB.
2-Heptylcyclopentanone	No	IFF.
Hexadecanolide	No	IFF.
2-Hexyl-2-cyclopenten-1-one	No	FB.
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-Hydroxynonanoic acid, γ -lactone (γ -Nonalactone)	No	ELN.
4-Hydroxyundecanoic acid, γ -lactone (γ -Undecalactone)	No	ELN.
Ionone (α - and β -)	No	BDS, GIV, NCI.
α -ionone	No	GIV, IFF.
Isobornyl acetate	No	SCM.
Isobornyl methyl ether	No	SCM.
Isobornyl propionate	No	ELN.
Isolongifolene epoxide	No	GIV.
Isomenthone	No	GIV.
6-Isopropyldecalone	No	GIV.
Isopulegyl acetate	No	GIV.
p-Mentha-1, 3-diene (α -Terpinene)	No	SCM.
p-Mentha-1, 4-diene (β -Terpinene)	No	SCM.
p-Mentha-6, 8-dien-2-ol (Carveol)	No	FB.
p-Mentha-6, 8-dien-2-one (Carvone, Carvol)	No	FB.
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.
dl-Menthol, synthetic	No	AMB, GIV, HAR, NCI.
l-Menthol, synthetic	No	HAR, SCM.
Menthyl acetate	No	GIV, SCM.
l-Menthyl acetate	No	SCM.
α -Methylcyclohexanemethanol	No	(?).
Methylionone (α - and β -)	No	GIV, IFF, NCI.
γ -Methylionone	Yes	BDS, GIV, IFF, NCI.

See footnotes at end of table.

Table 7-2—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 7-3)
Cyclic—Continued:		
Terpenoid, heterocyclic, and alicyclic—Continued		
6-Methyl- α -ionone	No	BDS, GIV.
Nopyl acetate	No	NCI, SCM.
para-Cymene	No	NCI, SCM.
Propyl furylacrylate	No	AMB.
Rose oxide	No	FB.
Terpene-ol	No	SCM.
α -Terpineol	Yes	HPC, NCI, SCM.
α -Terpinyl acetate	No	NCI, 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.
α , α ,5-Trimethyl-5-vinyl-furfuryl alcohol and tetrahydro-2,2,6-trimethyl-6-vinyl-3-ol	No	GIV.
5-(2,2,3-Trimethyl(cyclopent-3-en-1-yl)-3-methylpentan-2-ol	No	GIV.
Vetiveneol	No	FB, GIV, IFF.
Vetivenyl acetate	Yes	BDS, ELN, FB, GIV, IFF.
All other terpenoid, heterocyclic, or alicyclic flavor and perfume chemicals	No	CI, GPI, IFF, SCM, STG. (2), (4).
Acyclic:		
Allyl disulfide	No	IFF.
Allyl heptanoate	No	ELN, FB.
Allyl hexanoate	No	ELN, FB.
Butanoic acid, 1-cyclohexylethyl ester	No	CI.
Butyl butyryl lactate	No	ELN, FB.
Citral dimethyl acetal	No	FB, IFF.
Citronellyl acetate	Yes	BDS, ELN, GIV, IFF, SCM.
Citronellyl formate	Yes	BDS, ELN, FB, GIV, IFF.
Citronellyl isobutyrate	No	ELN, GIV, IFF.
Citronellyl propionate	No	IFF.
Crude acetate mixture (Linalyl, neryl, geranyl acetates, main components)	No	(2).
Decanal (Capraldehyde)	No	CI.
Decyl acetate	No	GIV.
Diethyl acetal	No	FB.
Diethyl sebacate	No	ELN.
Diethyl succinate	No	MRF.
Dihexyl fumarate	No	FB.
Dihydrocarvone	No	SCM.
Dihydrolinalool	No	SCM.
Dihydro myrcenol	No	SCM, (2).
Dihydro pentamethyl indanone	No	IFF.
Dihydroterpinyl acetate	No	IFF, NCI, SCM.
1,1-Dimethoxy octane	No	IFF.
4-(1,1-Dimethylethyl)cyclohexanol	No	(2).
Dimethyl hexanedial	No	(2).
2,5-Dimethyl-3-hexyne-2,5-diol	No	(2).
3,7-Dimethyl-trans-2,6-octadienal (Citral A; Geraniol)	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-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)	No	FB, IFF, SCM.
(Linalyl alcohol)	No	FB, IFF, SCM.

See footnotes at end of table.

Section 7

Table 7-2—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 7-3)
Acyclic:—Continued:		
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	Yes	ELN, GIV, IFF, SCM.
3,7-Dimethyl-1,6-octadien-3-ol, acetate (Linalyl acetate)	No	FB, 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)	No	GIV, IFF, NCI, SCM.
3,7-Dimethyl-3-octanol	No	FB, SCM.
Dimethyloctanyl acetate	No	GIV, IFF.
3,7-Dimethyl-6-octen-1-ol (Citronellal)	No	IFF, SCM.
3,7-Dimethyl-6-octenenitrile	No	CI.
3,7-Dimethyl-6-octen-1-ol (Citronellol)	No	ELN, GIV, IFF, NCI, SCM.
3,7-Dimethyl-7-octenol 70%, 6-octenol isomer 30%	No	GIV.
Ethyl acetate	No	FB.
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, SCM.
Ethyl-2 methyl pentanoate	No	HPC.
Ethyl myristate	No	ELN.
Ethyl octanoate	No	FB.
Ethyl propionate	No	FB, NW.
Ethyl trimethyl cyclopentenyl buterol	No	IFF.
Ethyl valerate	No	ELN.
Geranyl acetate	Yes	BDS, CI, ELN, FB, FEL, GIV, IFF, NCI, SCM.
Geranyl butyrate	No	ELN, GIV.
Geranyl crotonate	No	FB.
Geranyl ethyl ether	No	IFF.
Geranyl formate	Yes	BDS, ELN, GIV.
Geranyl isobutyrate	No	IFF.
Geranyl isovalerate	No	FB.
Geranyl nitrile (Citralva)	No	IFF, SCM.
Geranyl propionate	No	ELN, FB.
Geranyl tiglate	No	FB.
Heptyl formate	No	FB.
Hexadecyl acetate	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	SCM.
cis-3-Hexenyl methyl carbonate	No	IFF.
cis-3-Hexenyl tiglate	No	BDS.
Hexoxyacetaldehyde dimethyl acetal	No	FB.
Hexyl 2-methylbutyrate	No	SCM.
Hydroxycitronellol	No	SCM.
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	No	FB, GIV, IFF, SCM.
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (Hydroxycitronellal, dimethyl acetal)	No	GIV.
Isoamyl caproate	No	FB.
Isoamyl propionate	No	FB.
Isobutyl acetate	No	FB, NW.

See footnotes at end of table.

Table 7-2—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Flavor and perfume materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 7-3)
Acyclic:—Continued:		
Isobutyl-2-butenate	No	AMB.
Isobutyl butyrate	No	FB.
Isopentyl acetate (isoamyl acetate)	No	ELN, FB, NW.
Isopentyl butyrate	No	FB, GIV, NW.
Isopentyl formate	No	ELN, FB.
Isopentyl isovalerate	No	ELN, FB, HPC.
3-Methyl-2-butenyl acetate	No	IFF.
3-Methyl butyl acetate	No	FB.
3-Methyl butyl butyrate	No	FB.
Methyl butynol	No	(²).
2-Methyldecanal	No	CI.
2-Methylene undecanal	No	(²).
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.
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	No	ELN, GIV, SBC.
Ocimene	No	IFF.
Ocimenyl acetate	No	IFF.
Octanal	No	CI.
N-Octyl acetate	No	SCM.
Octyl formate	No	FB.
Octyl isobutyrate	No	FB.
Octyl isovalerate	No	GIV.
Pentyl acetate	No	FB.
N-Propyl acetate	No	NW.
Pseudo linalyl acetate (Neobergamate)	No	IFF.
Rhodinol	Yes	FB, 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	CI, GIV.
All other acyclic flavor and perfume materials	No	FB, GIV, IFF, (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 7-3

Flavor and perfume materials: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ABB	Abbott Laboratories	MON	Monsanto Co.
AMB	American Bio-Synthetics Corp.	MRF	Morflex Inc.
ARS	Arsynco, inc., Sub. Div., of Aceto Corp.	NCI	Unlon Camp Corp., BBA Div.
ARZ	Arizona Chemical Co.	NSW	Nutrasweet Co.
BDS	Fragrance Resources, Inc.	NW	Northwestern Chemical Co.
CI	Firmenich, Inc.	PD	Parke-Davis, Div. of Warner-Lambert Co.
CWN	Upjohn Co., Fine Chemicals	PFZ	Pfizer, Inc.
ELN	Elan Chemical Co.	PSG	PMC Inc., Specialties Group, Inc.
FB	Fritzsche Dodge & Olcott, Inc.	RAY	Rayonier Chemical Products Inc.
FEL	Felton Worldwide, Inc.	RDA	Rhone-Poulenc, Inc.
GIV	Glvaudan Corp.	SBC	Scher Chemicals, Inc.
GPI	Grindsted Products, Inc.	SCM	SCM Corp., Glidco Organics
HAR	Haarmann & Reimer Corp.	STG	McCormick & Co., Inc.
HPC	Hercules, Inc.		McCormick-Stange Flavor Div.
IFF	International Flavors & Fragrances, 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 questionnaire of the U.S. International Trade Commission.

Section 8 Plastics 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 1989 are given in table 8-1. U.S. production of plastics and resin materials in 1989 totaled 26,995 million kilograms, or 6.3 percent less than the 28,820 million kilograms produced in 1988. From 1985-89, the production of plastics and resin materials increased irregularly from 22,679 million kilograms in 1985 to 26,995 million kilograms in 1989, or at an average, annual rate of growth of 4.5 percent (see figure 8-1). Sales in 1989 totaled 23,819 million kilograms, valued at \$32,180 million, compared with 25,057 million kilograms, valued at \$33,831 million, in 1988.

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 4,033 million kilograms in 1989, compared with 4,352 million kilograms in 1988. Production of the most important products in 1989 included phenolic (834 million kilograms), amino (urea and melamine) resins (1,015 million kilograms), polyester resins, unsaturated (608 million kilograms), and alkyd resins (322 million kilograms).

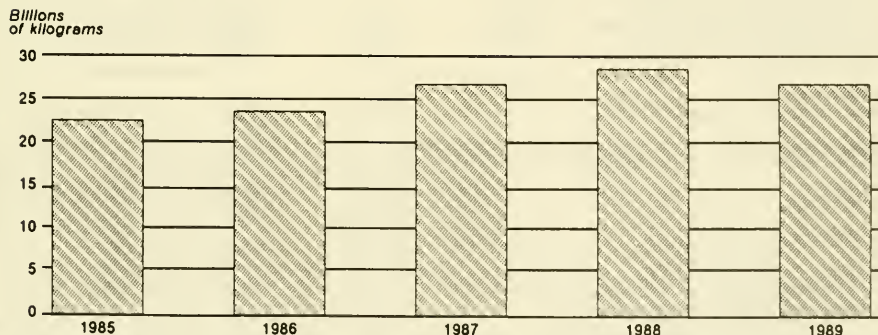
Thermoplastic materials are those which in their final state as finished articles can be repeatedly softened by heat and hardened by a decrease in temperature. U.S. production of thermoplastic materials totaled 22,962 million kilograms in 1989 (or 85.1 percent of the total plastics and resin materials output for 1989), compared with 24,468 million kilograms in 1988. Production of the most important products in 1989 included polyethylene (7,613 million kilograms), polypropylene (3,039 million kilograms), vinyl resins (4,733 million kilograms), and styrene type materials (3,591 million kilograms). In 1989, production of saturated polyester resins reached 1,535 million kilograms (polyethylene terephthalate alone reached 1,212 million kilograms). Production of engineering plastics, in the aggregate, amounted to 883 million kilograms in 1989.

Table 8-2 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 8-3.

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Figure 8-1
Plastics and resin materials: U.S. production, 1985-89



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

Section 8

Table 8-1

Plastics and resin materials: U.S. Production and sales, 1989

Plastics and resin materials	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms dry basis ²	1,000 kilograms dry basis ²	1,000 dollars	Per kilogram
Grand total	26,995,481	23,819,400	32,180,380	\$1.35
Thermosetting resins				
Total	4,033,128	3,133,613	4,901,593	1.56
Alkyd resins, total				
Phthalic anhydride type	251,889	172,284	270,029	1.57
Polybasic acid type	12,649	7,035	13,329	1.89
Styrenated-alkyds or copolymer alkyd	10,510	2,714	4,669	1.72
Vinyl toluene alkyds	12,415	10,059	15,825	1.57
All other alkyd resins	35,012	26,338	78,218	2.97
Dicyandiamide resins (an amino resin)	1,258	1,161	2,972	2.56
Epoxy resins:^{3 4}				
Unmodified	259,044	174,669	436,105	2.50
Advanced	(127,340)	(76,918)	(224,224)	(2.92)
Furfuryl type resins	7,881	7,818	12,091	1.55
Glyoxal-formaldehyde resins	10,610	(⁶)	(⁶)	(⁶)
Melamine-formaldehyde resins (an amino resin)	81,613	69,168	135,115	1.95
Phenolic and other tar acid resins	833,554	517,047	972,066	1.88
Polyester resins, unsaturated ⁵	607,899	582,309	1,651,262	2.84
Polyether and polyester polyols for urethanes ⁷	700,576	558,617	532,891	.95
Polyurethane elastomers and plastics products, total				
Elastomers ⁸	173,941	56,989	237,878	4.17
Plastics	42,819	44,493	126,146	2.84
Urea-formaldehyde resins (an amino resin) ⁹	933,877	851,717	255,815	.30
All other thermosetting resins ¹⁰	57,581	51,195	157,182	3.07
Thermoplastic resins				
Total	22,962,353	20,685,787	27,278,787	1.32
Acrylic resins, total¹¹				
Homopolymer resins, except PMMA, of acrylic or methacrylic acid esters	29,455	22,346	50,377	2.25
Polymethyl methacrylate (PMMA) resins	291,416	189,329	450,152	2.38
Thermosetting acrylic resins	63,881	19,352	53,283	2.75
All other acrylic resins	349,883	323,094	861,220	2.67
Engineering plastics ¹²	883,394	685,595	2,414,183	3.52
Petroleum hydrocarbons resins	163,272	145,622	158,494	1.09
Polyamide resins, total				
Nylon type ^{11 13}	290,737	253,652	722,635	2.85
Non-nylon type	32,906	31,880	64,865	2.03
Polyester resins, saturated, total^{11 14}				
Polyethylene terephthalate (PET)	1,211,704	1,019,478	1,620,969	1.59
All other saturated polyesters, including Polybutylene terephthalate, (PBT) resins	323,710	266,003	771,726	2.90

See footnotes at end of table.

Table 8-1—Continued

Plastics and resin materials: U.S. Production and sales, 1989

Plastics and resin materials	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms dry basis ²	1,000 kilograms dry basis ²	1,000 dollars	Per kilogram
Thermoplastic resins—Continued				
Polyethylene resins, total	7,613,260	7,189,525	7,739,620	\$1.08
Ethylene-vinyl acetate and other copolymer resins	294,470	260,169	362,145	1.39
Specific gravity 0.940 and below, total ^{1a}	4,121,040	3,864,415	3,891,069	1.01
Low density polyethylene (LDPE) resins	3,028,564	2,793,091	2,883,139	1.03
Linear low density polyethylene (LLDPE) resins	1,092,476	1,071,324	1,007,930	.94
Specific gravity over 0.940	3,197,750	3,064,941	3,486,406	1.14
Polypropylene resins	3,039,309	2,973,768	2,473,616	.83
Polyterpene resins	12,677	13,444	31,942	2.39
Polytetrafluoroethylene (PTFE) resins	(5)	12,482	174,665	13.99
Rosin modifications, total	152,363	131,681	174,418	1.32
Modified rosin (unesterified)	67,487	53,598	48,752	.91
Modified rosin esters	65,579	59,704	99,286	1.66
Rosin esters, unmodified (Ester gums)	19,297	18,379	26,380	1.44
Styrene plastics materials, total	3,591,407	3,021,437	4,476,538	1.48
Acrylonitrile-butadiene-styrene terpolymer (ABS) resins	547,436	500,304	1,021,475	2.04
Methyl methacrylate-butadiene-styrene (MBS) resins and certain other styrene type plastics materials	135,758	135,433	278,056	2.05
Polystyrene homopolymers, total	2,400,264	1,955,474	2,464,229	1.26
Expandable polystyrene beads	315,828	259,183	403,757	1.56
Rubbar modified polystyrene	808,919	741,966	940,092	1.27
Straight polystyrene	1,275,517	954,325	1,120,380	1.17
Styrene latexes, total	290,808	306,028	456,928	1.49
Styrene-butadiene latexes	275,402	289,872	431,631	1.49
All other styrene latexes	15,406	16,156	25,297	1.57
All other styrene plastics materials ^{1b}	217,141	124,198	255,850	2.06
Vinyl resins, total ¹⁷	4,732,869	4,233,739	4,401,723	1.04
Polyvinyl acetate ¹⁸	296,642	215,566	347,714	1.61
Polyvinyl chloride and copolymers	4,002,595	3,648,741	3,459,578	.95
Polyvinylidene chloride resins, latex type	11,502	10,716	21,474	2.00
Vinyl acetate-acrylate copolymers	215,433	204,263	228,048	1.12
All other vinyl and vinylidene resins ¹⁹	206,697	154,453	344,909	2.23
All other thermoplastic resins ²⁰	180,110	153,360	638,361	4.16

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 Reported data were accepted in confidence and may not be published, or no data were reported.⁶ Polyester resins are unsaturated alkyd resins, later to be copolymerized with a monomer (Such as styrene or methyl methacrylate), and polyalyl resins (such as diallyl phthalate and diglycol carbonate). Data are on an "as sold" basis, including monomer if part of the resin system.⁷ 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-diliscyanate.

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

Footnotes for table 8-1—Continued

* 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.

⁹ Includes thiourea resins.

¹⁰ Includes acetone-formaldehyde resins, glyoxal-formaldehyde resins (sales only), polybutadiene resins, silicone resins, and certain other thermosetting resins.

¹¹ Does not include production or sales for fiber use.

¹² Engineering plastics: Includes acetal, polycarbonate, polyetheretherketone (PEEK) resins, 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.

¹³ Statistics for nylon 6 and nylon 6/6 which are used in plastics applications (e.g., molding, etc.) are included here.

¹⁴ 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.

¹⁵ Data shown for LLDPE resins are incomplete because several of the leading producers of LLDPE (e.g., Union Carbide Corp.) still continue to aggregate these data with that of LDPE.

¹⁶ 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.

¹⁷ 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.

¹⁸ 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.

¹⁹ Includes polyvinyl alcohol, polyvinyl butyral, polyvinyl formal, polyvinylidene chloride (solid type), and other vinyl resins.

²⁰ Includes cellulose plastics, coumarone-indene resins, fluorocarbon resins, (except PTFE sales), 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 8-2

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

<i>Plastics and resin materials</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 8-3)</i>
Thermosetting resins		
Acetone-formaldehyde resins	No	ACY, CMP, FLH, GP.
Alkyd resins:	Yes	
Acrylate-alkyd copolymer resins	No	CPV, DRC, DRR, FRE, MNP, PPG, REL.
Alkoyl phenol	No	(²).
Phthalic anhydride type alkyd resins	Yes	ACO, ACY, AKZ, BAL, BLC, BRU, CCC, CGL, CJO, CPV, DSO, DUP, EW, FOC, FRE, GLD, GRG, GRV, HAN, HIL, ICF, IMI, JNS, LIC, MMM, MNP, NCP, NTL, OBC, PPG, PRT, QCP, RCI, REL, REZ, SRY, SW, TCC, UNO, (²), (²), (²)
Polybasic acid type alkyd resins	Yes	ACY, BAL, CJO, CPV, DSO, FOC, GLD, HAN, ICF, IMI, IOV, NTL, OBC, PPG, REL, SCN, SW.
Styrenated-alkyds, or copolymer alkyds	Yes	BLC, CJO, CPV, DRC, DSO, EW, FRE, GLD, IMI, JNS, MNP, MRT, REL, RUO, SW, (²).
Vinyl toluene alkyds	Yes	BLC, CGL, CJO, CPV, FRE, GLD, IMI, JNS, MNP, PRT, REL, SW.
All other alkyd copolymers	No	BLC, CGL, CJO, DUP, MNP, SW.
Amino resins:		
Melamine-formaldehyde resins	Yes	AUX, BOR, CBD, CGL, CPV, DGO, GP, GRG, HCL, MNP, MON, OCF, PLS, PMC, PPG, PPL, PST, RCI, REL, REZ, SCN, SQA, SYT, TCC, UCC, UTC, WRD.
Thiourea resins	No	CMP.
Urea-formaldehyde resins	Yes	ACY, AUX, BOR, CBD, CGL, CMP, CPV, DSO, GP, GRV, MMM, PMC, PST, REL, REZ, SAC, SOR, SQA, WPG.
Dicyandiamide resins	Yes	CMP, ECC, HCL, S, TCC, UTC.
Epoxy resins:		
Epoxy, resins advanced	Yes	AKZ, ASL, CGL, CGY, CJO, CNI, CPV, DOW, DSO, EW, GE, GLD, GRG, GRV, HAN, HXL, HYA, ICF, MID, MIL, MMM, MNP, MRT, OCF, PAC, PPG, RCI, REZ, SMO.
Epoxy, resins unmodified	Yes	ASH, CGY, CLU, DAN, DOW, PRT, RCI, REZ, SHC, UCC, (²).
Furfuryl type resins	Yes	CLU, DRR, HVG, UNO, WRD.
Glyoxal-formaldehyde resins	Yes	AIP, AUX, CMP, HCL, RBI, SQA, TCC, WPG.
Phenolic and other tar acid resins	Yes	ACY, ADC, ASH, BAL, BME, BOR, BSC, BTL, CBD, CLU, CPV, DRR, DSO, EW, GE, GP, HCL, HER, HKD, HPC, HVG, ICF, IMI, IRI, ISP, LIL, MCA, MID, MMM, NCI, NTL, OBC, OCF, PLS, PSG, RCI, RH, SCN, SPL, UNO, USR, VSV, WCA, WRD, (²), (²), (²), (²).
Polybutadiene resins	No	CSC, CNI, CRS, LC, PSL.
Polyester resins, unsaturated, and allyl resins:	Yes	
Allyl resins	No	CMS, IMI.
Diallyl isophthalate	No	ATR, CMS.
Polyester resins, unsaturated	No	ACY, ADC, APH, ART, ASH, CGL, CPV, DSO, EW, FJI, FRE, GLD, GRG, ICF, ICI, IMI, IPC, LIL, MRT, NCP, OCF, PPG, PPL, RCI, SCN, SHX, SIC.
Polyether and polyester polyols for urethanes	Yes	BAS, BMC, BPT, CHC, CPV, CXI, DOW, DSO, FRE, GRG, HCF, ICI, JNS, MRT, NTL, OMC, PPG, PPL, RCI, RUO, SLC, SYT, UCC, WM.
Polyurethane elastomer and plastic products:		
Polyurethane elastomers	Yes	ACY, ADC, ARK, ARO, BAS, BPT, CAS, CGY, CNI, DCC, DNS, EPI, EW, FMX, GLC, GRD, HXL, HYC, ICF, IMI, INP, MRT, PLN(E), PPG, PRC, QUN, RUO, SCN, SLC, SMO, SYT, USM, USR.

See footnotes at end of table.

Section 8

Table 8-2—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Plastics and resin materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 8-3)
Thermosetting resins		
Polyurethane elastomer and plastic products—Continued		
Polyurethane resins	Yes	ACO, CGL, DSO, DUP, GLD, INP, LC, MID, MOB, OMC, PEL, SHX, SIF, SW, CJO, DCC, PEL, SPD.
Silicone resins	No	ACY, AKZ, BAS, DSO, FRE, GLD, MID, MIL, MNP, OBC, REL, RTC, S, SYT, TCC, (2), (2).
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	CGL, UOC.
2-Ethylhexyl acrylate-methyl acrylate copolymer resins	No	UOC.
Lauryl methacrylate-stearyl methacrylate copolymer resins	No	ICI.
All other copolymer resins of acrylic and/or methacrylic acid	No	ACO, AIP, BPT, CGL, CHP, CPV, DRB, DRC, DSO, FLH, GGI, GLD, ICF, ICI, JNS, KMP, MON, NSC, PPG, PRA, PYI, RCI, RH, SCP, SW, SYT, TCC, TNA, UCC, (2).
Homopolymer resins of acrylic and/or methacrylic acid resins:		
Other homopolymer resins of acrylic and/or methacrylic acid esters	Yes	CGL, CPV, DUP, GRV, ICF, PYI, RH, SAR, SCP, SW, UOC.
Polymethyl methacrylate (PMMA)	Yes	ACY, ART, CTP, CYR, DUP, ICF, JNS, MRT, PKL, RH, SAR, SQA, TCC.
Thermosetting acrylate resins	Yes	AIP, AKZ, CGL, CPV, DRC, DSO, DUP, FRE, GRV, ICF, MID, MNP, PPG, PRA, REL, REZ, SCP, SM, SW, (2).
Cellulose plastics and resins:		
Cellulose acetate	No	EKT.
Cellulose acetate butyrate	No	EKT.
Cellulose acetate propionate	No	EKT.
Ethyl cellulose	No	(2).
Coumarone-Indene resins	No	CPV.
Engineering plastics:		
Acetal resins	No	DUP, HCL, PRT, RAS.
Polycarbonate resins	No	DOW, GE, GEP, MOB, SQA.
Polyetheretherketone (PEEK) resins	No	EKT.
Polyimides and amide-imide polymers	No	DUP, EW, GE, GEP, GRG, PDI, SCN.
Polyphenylene oxide type resins	No	GE, GEP, NTL.
Polyphenylene sulfide resins	No	HCL, 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	DUP.
Petroleum hydrocarbon resins	No	CFX, CXI, EKK, ENJ, GYR, HPC, ICF, LII, NEV, RCI, (2).
Phenoxy (R) resin (other than for coating and adhesives)	No	NEV, UCC.
Plastics alloys or blends	No	MOB.
Polyamide resins:		
Non-nylon type, polyamide resins	Yes	BAL, COO, EFH, GP, HCL, LII, NCI, OBC, PAC, S, SCP, SQA, USM.
Nylon type, polyamide resins	Yes	ACS, AGI, BAS, BCM, CTR, DGO, DUP, GRG, HCL, MON, RSN, SCP, SHX, SKP, USM.

See footnotes at end of table.

Table 8-2—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Plastics and resin materials	Separate statistics ¹	Manufacturers' identification codes (according to list in table 8-3)
Thermoplastic resins—Continued:		
Polybutylene type resins	No	ENJ, SHC.
Polyester resins, saturated:	Yes	
Polybutylene terephthalate (PBT)	No	BAS, DUP, GE, GEP, HCL, MOB, USM.
Polyethylene terephthalate (PET)	Yes	ACS, DUP, EKT, FBI, GEP, GYR, HCL, ICI, IMI, MOB, USM, (?).
All other polyester resins, saturated	Yes	COO, CPV, DUP, EKT, GLD, GRG, GYR, HCL, ICF, ICI, MNP, PPG, REL, SCN, SW.
Polyethylene and copolymers resins:		
Ethylene-acrylic acid resins (EAA)	No	DOW.
Ethylene-vinyl acetate (EVA) copolymer resins	Yes	COO, ENJ, NSC, RCI, 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, LYP, SM, SOC, SQA, UCC, USI, (?).
Specific gravity 0.940 and below (linear low density)	Yes	CMP, DOW, ENJ, SM, USI.
Specific gravity over 0.940	Yes	ACS, CNE, DOW, ENJ, HCL, HIM, PLC, SLT, SOC, UCC, USI.
Polyphenyl aromatic ester resins	No	HPC.
Polypropylene polymer and copolymer resins	Yes	AMO, ART, BAS, CSD, EKX, ELP, ENJ, HIM, PLC, SHC, SLT, USI.
Polyterpene resins	Yes	ARZ, HPC, RCI.
Resin modifications:		
Modified rosin (Unesterified)	Yes	ARZ, CJO, HPC, ICF, NCI, SYL, WVA.
Modified rosin esters	Yes	CPV, EW, FJI, FRP, GLD, GP, GRV, HCL, HPC, LII, NCI, RCI, SYL, WVA.
Rosin esters, unmodified (Ester gums)	Yes	ARZ, CPV, FRP, HPC, NCI, RCI.
Styrene type plastics materials:		
Acrylonitrile-butadiene-styrene (ABS) terpolymer resins	Yes	DOW, GE, GRD, MON.
Methyl methacrylate-butadiene styrene (MBS) resins and certain other styrene type copolymer plastics	Yes	AIP, ARZ, ASL, CPV, CYR, DSO, EW, FLH, GE, GEP, GGI, GYR, HPC, JNS, MON, MRT, OBC, PLC, RCD, RH, TCC.
α -Methyl styrene polymers	No	AIP, AMO, CPV, GGI, JNS.
Styrene-acrylonitrile copolymer resins (SAN)	No	BFG, DOW, GE, ICI, MON.
Polystyrene:		
Expandable polystyrene beads	No	ATR, BAS, DPI, HMN, TXS.
Rubber modified polystyrene	No	API, CSD, DOW, DPI, HMN, SM.
Straight polystyrene	No	AEP, AMO, API, ATR, CSD, DOW, DPI, GAF, HGC, HMN, HPC, KTP, SM, SOC, TXS.
Styrene latexes:		
Styrene-butadiene latexes	No	DOW, GRD, GYR, PYI, RCI, UOC.
All other styrene latexes	No	ADC, CCS, CRS, FRS, GRD, SPO, UCC, UOC.
Other styrene copolymers:		
Styrene-allyl alcohol copolymer resins	No	HPC, MON.
Styrene-divinylbenzene copolymer resins	No	EK, RH, TCC.
Styrene-maleic anhydride copolymer resins	No	ATR, JNS, MON.
Styrene-methyl methacrylate copolymer resins	No	ADC, GGI, RCD.
All other, styrene type plastics materials	No	FER, ICI.
Vinyl resins:		
Polyvinyl acetate resins	Yes	AIP, CGL, DSO, FLH, FLN, GLD, GRD, JNS, MNP, MON, NSC, PRA, PYI, RCI, SQA, TCC, UCC, UOC, (?).
Polyvinyl alcohol resins	No	AIP, DUP.
Polyvinyl butyral resins	No	MON.
Polyvinyl formal resin	No	GRG, MON.

See footnotes at end of table.

Table 8-2—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

<i>Plastics and resin materials</i>	<i>Separate statistics¹</i>	<i>Manufacturers' Identification codes (according to list in table 8-3)</i>
Thermoplastic resins—Continued		
Vinyl resins—Continued		
Vinyl acetate-acrylate copolymers	Yes	ACO, CMP, DAN, DSO, FLH, FLN, GLD, NCJ, NTC, OBC, PRA, RCI, RH, SPC, SQA, UCC, UOC.
Polyvinyl chloride and copolymer resins:		
Polyvinyl chloride homopolymer resins	No	AIP, BCP, BFG, CNT, FOR, GGC, GYR, HKP, KYS, SHT, UCC, VST, VYN.
All other polyvinyl chloride copolymer resins	No	BFG, HKP, VYN.
Vinyl chloride-acetate copolymer resins	No	BCP, KYS.
Polyvinylidene chloride resins:		
Latex type polyvinylidene chloride resins	Yes	BFG, DOW, GRD, UOC.
Solid type polyvinylidene chloride resins	No	DOW.
Vinyl resins, all other	Yes	DUP, EW, FLH, GLD, NTC, RH, UCC, (2).
All other, thermoplastic resins, benzenoid	Yes	DUP, ENJ, HCL, LII, NES, UOC. (2).

¹ Chemicals for which separate statistics are reported in this section are indicated by 'yes.' Chemicals or 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 8-3

Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
ACO	Adco Chemical Co.	CPV	Cook Paint & Varnish Co.
ACS	Allied Signal, Inc.	CRS	Colorado Resins, Inc.
	Engineered Materials Sector.	CSD	Fina Oil & Chemical Co., Cosden
	Engineered Plastic Div.		Chemical Div.
	High Density Polyethylene Business	CTP	Continental Polymers, Inc.
ACY	American Cyanamid Co.	CTR	Custom Resins Div. of Bemis Co., Inc.
ADC	Anderson Development Co.	CXI	Chemical Exchange Industries, Inc.
AEP	A & E Plastics Corp.	CYR	CYRO Industries
AGI	EMS-American Grillon, Inc.	DAN	Dan River, Inc., Chemical Products Div.
AIP	Air Products & Chemicals, Inc.	DCC	Dow Corning Corp.
AKZ	Akzo Coating, Inc.	DGO	Day-Glo Color Corp.
AMO	Amoco Corp.	DNS	Dennis Chemical Co.
APH	Alpha Corporation of Tennessee	DOW	Dow Chemical Co.
API	American Polymers, Inc.	DPI	Dart Polymers, Inc., Sub of Dart
ARK	Armstrong World Industries, Inc.		Container
ARO	Arnco		Corp.
ART	Arlstech Chemical Corp.	DRB	Rohm Tech, Inc.
ARZ	Arizona Chemical Co.	DRC	Dock Resins Corp.
ASH	Ashland Oil, Inc.	DRR	Delta Resins & Refractories
ASL	Specialtychem Products Corp.	DSO	DeSoto, Inc.
ATR	Atlantic Richfield Co., Arco Chemical	DUP	E. I. duPont de Nemours & Co., Inc.
Co.			Automotive Product Dept.
AUS	Ausimont N.V.		Chemicals and Pigments Dept.
AUX	Auralux Corp.		ED/IMG Dept.
BAL	Sherwin-Williams Co., Consumer Div.		Petrochemicals Dept.
BAS	BASF Corp.		Polymer Products Dept.
BCM	Belding Chemical Industries	ECC	Eastern Color & Chemical Co.
BCP	Borden Chemical & Plastics Delaware	EFH	E. F. Houghton & Co.
	Limited Partnership	EK	Eastman Kodak Co.;
BFG	B. F. Goodrich Co.	EKT	Tennessee Eastman Co. Div.
BLC	Ranbar Technology, Inc.	EKX	Texas Eastman Co. Div.
BMC	Brlin-Mont Chemicals, Inc.	ELP	Rexene Products Company
BME	Allied Signal Bendix Corp., Friction	ENJ	Exxon Chemical Americas
	Materials Div.	EPI	Eagle Picher Industries, Orthane Div.
BOR	Borden, Inc., Packaging & Industrial	EVL	Eval Company of America
	Products Div.	EW	Westinghouse Electric Corp., Insulating
BPT	Permethane Coatings, Inc.		Materials Div.
BRU	M. A. Bruder & Sons, Inc.	FBI	Fibers Industries, Inc.
BSC	Cascade Resins, Inc.	FER	Ferro Corp., Kell Chemical Div.
BTL	BTL Specialty Resin Corp.	FJI	Cincinnati Varnish Co.
CAS	CasChem, Inc.	FLH	H. B. Fuller Co.
CBD	Chembond Corp.	FLN	Franklin International
CCC	C.N.C. International Inc.	FMX	Foamex Products, Inc., Div., of Knoll
CCS	Colorado Chemical Specialties, Inc.		International
CFX	Chemfax, Inc.	FOC	Handschy Industries, Inc., Ink &
CGL	Cargill, Inc.		Chemicals Div.
CGY	Ciba-Gelgy Corp.	FOR	Formosa Plastics Corp. - U.S.A.
CHC	Carpenter Chemical Co.	FRE	Freeman Chemical Corp.
CHP	C. H. Patrick & Co., Inc.	FRP	Akzo Coatings, Inc.
CJO	C. J. Osborn Chemicals, Inc.	FRS	Firestone Tire & Rubber Co., Firestone
CLU	CL Industries, Inc.		Synthetic
CMP	Commercial Products Co., Inc.		Rubber & Latex Co. Div.
CMS	Cosmic Plastics, Inc.	GAF	GAF Chemical Corp.
CNE	Oxy Petrochemicals, Inc.	GE	General Electric Co.;
CNI	Conap, Inc.		Electromaterials Div.
CNT	CertainTeed Corp.		Specialty Chemical Group
COO	H.B. Fuller Co.	GEP	Plastics Div.

See note at end of table.

Table 8-3—Continued

Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
GGC	Georgia-Gulf Corp.,: PVC Compound Div. Plaquemine Div.	MID	Dexter Corp., Dexter Specialty Coatings
GGI	Grow Group, Inc.	MIL	Milliken & Co., Milliken Chemical Co.
GLC	General Latex & Chemical Corp.	MMM	Minnesota Mining & Manufacturing Co.
GLD	Glidden Co.	MNP	Mcwurther, Inc.
GP	Georgia-Pacific Corp.: Resins Operations	MOB	Mobay Chemical Corp., Pittsburgh Div.
GRD	W. R. Grace & Co., Organic Chemicals Div.,	MON	Monsanto Co.
GRG	P. D. George Co.	MRT	Morton International Inc., Morton Chemical Div.
GRV	Guardman Chemicals, Inc.	NCI	Union Camp Corp.
Gyr	Goodyear Tire & Rubber Co.	NCJ	National Casein of New Jersey
HAN	Akzo Coatings	NCP	Niles Chemical Paint Co.
HCF	Cape Industries	NES	Rutgers-Nease Chemical Co.
HCL	Hoechst Celanese Corp.: Bayport Works Engineering Plastics Div. Fibers Industrial Div. Sou-Tex Works	NEV	Naville Chemical Co.
HER	Heresite Protective Coatings, Inc.	NSC	National Starch & Chemical Corp.
HGC	Goodson Polymers, Inc.	NTC	National Casein Co.
HIL	Hilton Davis Company	NTL	NL Industries, Inc.
HIM	Himont U.S.A., Inc. Occidental Chemical Corp.:	OBC	O'Brien Corp.
HKD	Durez Div.	OCF	Owens-Corning Fiberglas Corp.
HKP	Polymers and Plastics Div.	OMC	Olin Corp.
HMN	Huntsman Chemical Corp.	PAC	Pacific Anchor Chemical Corp.
HPC	Hercules, Inc.	PAS	Atochem North America, Inc.
HVG	Ametek, Inc., Haveg Div.	PDI	Phelps Dodge Industries, Inc., Phelps Dodge Magnet Wire Co. Div.
HXL	Hexcel Corp., Hexcel Chemical Products Dexter Corp.	PEL	Peiron Corp.
HYA	Dexter Adhesives and Structural Material Div.	PKL	Plaskolite, Inc.
HYC	Dexter Electronic Materials Div.	PLC	Phillips 66 Co.
ICF	BASF Corp., Coating and Colorants	PLN	Disogrin Industries Corp.
ICI	ICI Americas: Film Group Div. Resin Div. Specialty Chemical Div.	PLS	Plastics Engineering Co.
IMI	Insulating Materials, Inc.	PMC	Plastics Manufacturing Co.
INP	Synlar Corp.	PPG	PPG Industries, Inc.
IOV	Akzo/Iovite, Inc.	PPL	Pioneer Plastics Corp.
IPC	Interplastic Corp.	PRA	Para-Chem Southern, Inc.
IRI	Stuart-Ironsidles, Inc.	PRC	Products Research & Chemical Corp.
ISP	Indspec Chemical Corp.	PRT	Pratt & Lambert, Inc.
JNS	S.C. Johnson & Son, Inc.	PSG	PMC Specialites Group
KMP	Kelly-Moore Paint Co., Inc.	PSL	Plaslok Corp.
KTP	Kama Corp.	PST	Perstorp Compounds, Inc.
KYS	Keysor Century Corp.	PYI	Morton International, Inc., Morton Chemical Div.
LC	Lord Corp., Chemical Products Group	QCP	Quaker Chemical Corp.
LIC	Lilly Industrial Coatings, Inc.	QUN	K. J. Quinn & Co., Inc.
LII	Lawter International, Inc.	RAS	Surface Coatings, Inc.
LYP	Lyondell Petrochemical Co.	RBI	Reeves Brothers, Inc.
MCA	Masonite Corp., Alpine Resin Div.	RCD	Polysar, Inc.
		RCI	Reichhold Chemicals, Inc.
		REL	Akzo Coatings, Inc.
		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 Chemicals Corp., Color and Chemicals Div.

See note at end of table.

Table 8-3—Continued

Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
SAC	Southeastern Adhesives Co.	SPO	Ameripol Synpol Co. Div. of Unroyal Goodrich Tire Co.
SAR	Esschem, Inc.	SQA	Sequa Chemicals, Inc.
SCN	Schenectady Chemicals, Inc.	SRY	Synray Corp.
SCP	Henkel Corp.	SW	Sherwin-Williams Co.
SHC	Shell Chemical Co.	SYL	Arizona Chemical Co.
SHT	Shlntech, Inc.	SYT	Synthron, Inc.
SHX	Sherex Chemical Co.	TCC	Sybron Chemicals, Inc.
SIC	BP Chemicals, Inc., Silmar Div.	TNA	Ethyl Corp.
SIF	BP Chemicals, Inc., Filon Div.	TXS	Scott Polymers, Inc.
SKP	Shakespeare Co. Monofilament Div.	UCC	Union Carbide Corp., Industrial Chemical Div.
SLC	Soluol Chem Co., Inc.	UNO	United-Erie, Inc.
SLT	Soltex Polymer Corp.	UOC	Union Oil Co. of California
SM	Mobil Oil Corp.:	USI	Quantum Chemical Corp., USI Division
	Mobil Chemical Co.:	USM	Emhart Corp., Bostik Div.
	Chemical Products Div.	UTC	Unltex Chemical Corp.
	Petrochemicals Div.	VST	Vista Chemical Co.
	Polystyrene Business Group	VSV	Valentine Sugars, Inc.
SMO	Smooth-On, Inc.	VYN	Vygen, Inc.
SOC	Chevron Corp., Chevron Chemical Co.	WCA	West Coast Adhesives Co.
SOR	MW Manufacturers, Inc., Southern Resin Div.	WM	Inolux Chemical Co.
SPC	Insilco Corp., Sinclair Paint Co. Div.	WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
SPD	General Electric Co., Silicone Products Dept.	WRD	Weyerhaeuser Co.
SPL	Spaulding Composites Co., Inc.	WVA	Wastvaco 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 1989 are given in table 9-1. Data on production of rubber-processing chemicals during 1985-89 are given in figure 9-1.

Production of rubber-processing chemicals as a group in 1989 amounted to 176 million kilograms, or 10 percent more than the 160 million kilograms produced in 1988. Sales of rubber-processing chemicals in 1989 amounted to 129 million kilograms, valued at \$473 million, compared with 121 million kilograms, valued at \$424 million, in 1988.

The production of cyclic rubber-processing chemicals in 1989 amounted to 155 million kilograms, or 7 percent more than the 144 million kilograms produced in 1988. Sales of cyclic rubber-processing chemicals in 1989 totaled 109 million kilograms, valued at \$430 million, compared with 107 million kilograms, valued at

\$397 million, in 1988. Of the total production of cyclic rubber-processing chemicals in 1989, antioxidants, antiozonants, and stabilizers accounted for 68 percent, and accelerators, activators, and vulcanizing agents for 29 percent. Production of antioxidants, antiozonants, and stabilizers, which amounted to 105 million kilograms in 1989, included 64 million kilograms of amino compounds and 41 million kilograms of phenolic and phosphite compounds. Sales of amino antioxidants, antiozonants, and stabilizers in 1989 amounted to 46 million kilograms, valued at \$174 million; sales of phenolic and phosphite compounds were 26 million kilograms, valued at \$91 million.

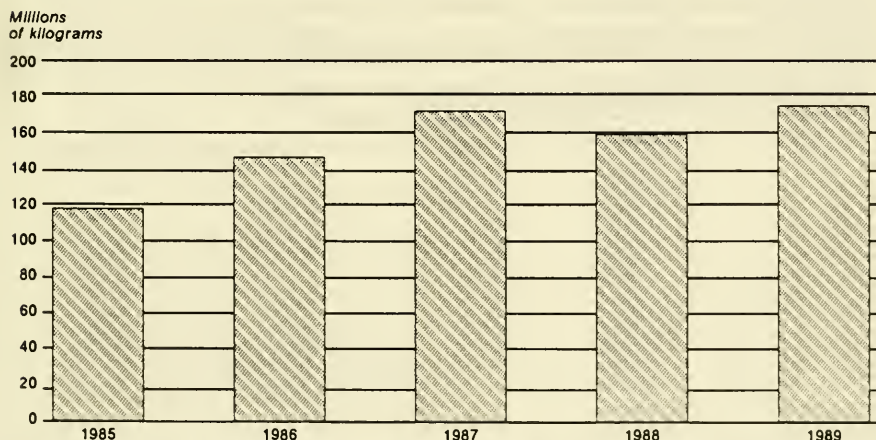
Production of acyclic rubber-processing chemicals in 1989 amounted to 21 million kilograms, or 34 percent more than the 16 million kilograms produced in 1988. Sales in 1989 totaled 20 million kilograms, valued at \$43 million, compared with 13 million kilograms, valued at \$27 million, in 1988.

Table 9-2 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 9-3.

Cynthia Trainor
202-252-1354

(Effective 1/14/91 202-205-3354)

Figure 9-1
Rubber-processing chemicals: U.S. production, 1985-89



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

Table 9-1

Rubber-processing chemicals: U.S. production and sales, 1989

Rubber-processing chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand Total	175,865	128,846	472,892	\$3.67
Cyclic				
Total	155,035	108,721	429,565	3.95
Accelerators, activators, and vulcanizing agents total	45,107	32,417	130,075	4.01
Thiazole derivatives, total	38,709	26,516	91,819	3.46
N-tert-Butyl-2-benzothiazolesulfenamide	10,307	9,293	37,520	4.04
2,2'-Dithiobis[benzothiazole]	5,105	5,250	13,375	2.55
All other thiazole derivatives	23,297	11,973	40,924	3.42
All other accelerators, activators, and vulcanizing agents ^{2, 3}	6,398	5,901	38,256	6.48
Antioxidants, antiozonants, and stabilizers, total ..	105,327	71,498	265,205	3.71
Amino compounds, total	64,072	45,815	174,367	3.81
Substituted p-phenylenediamines	41,810	24,730	112,892	4.56
All other amino compounds ⁴	22,262	21,085	61,475	2.92
Phenolic and phosphite compounds, total ⁵	41,255	25,683	90,838	3.54
Polyphenolics	3,699	3,086	24,995	8.10
All other phenolic and phosphite compounds	37,556	22,597	65,843	2.91
All other cyclic rubber-processing chemicals ⁶	4,601	4,806	34,285	7.13
Acyclic				
Total	20,830	20,125	43,327	2.15

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 Includes blowing agents and other cyclic rubber-processing chemicals.

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

Table 9-2

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Rubber-processing chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 9-3)
Cyclic:		
Accelerators, activators, and vulcanizing agents:		
Aldehyde-amine reaction products:		
Heptaldehyde-aniline condensate	No	USR.
Triethyltrimethylenetriamine	No	USR.
All other aldehyde-amine reaction products, cyclic ..	No	DUP.
Dithiocarbamic acid derivatives:		
Dibenzylidithiocarbamic acid, sodium salt	No	USR.
Dibenzylidithiocarbamic acid, zinc salt	No	USR.
Dibutylidithiocarbamic acid, diphenylguanidine salt	No	RCI.
Guanidines:		
Dicatechol borate, di-o-tolylguanidine salt	No	VNC.
All other guanidines, cyclic	No	VNC.
Thiazole derivatives:		
N-tert-Butyl-2-benzothiazolesulfenamide	No	BFG, MON, USR.
N-Cyclohexyl-2-benzothiazolesulfenamide	No	MON, USR.
2,2'-Dithiobis(benzothiazole)	No	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-Oxydiethylenethiocarbamyl-N'-oxydiethylenesulfenamide	No	BFG.
All other thiazole derivatives, cyclic	No	(²).
All other cyclic accelerators, activators, and vulcanizing agents:		
Bis(morpholinthiocarbamoyl) 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-Mercaptotoluidimidazole, zinc salt	No	VNC.
m-Phenylenebismaleimide	No	DUP.
All other accelerators, activators, and vulcanizing agents, cyclic	No	DUP, USR.
Antioxidants, antiozonants, and stabilizers:		
Amino antioxidants, antiozonants, and stabilizers:		
Aldehyde- and acetone-amine reaction products:		
Diphenylamine-acetone aldehyde	No	USR.
Diphenylamine-acetone condensate	No	BFG, USR.
All other aldehyde and acetone-amine reaction products, cyclic	No	USR.
Substituted p-phenylenediamines:		
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.

See footnotes at end of table.

Table 9-2—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Rubber-processing chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 9-3)
Cyclic—Continued		
Antioxidants, antiozonants, and stabilizers—Continued		
Amino antioxidants, antiozonants, and stabilizers—Cont.		
Substituted p-phenylenediamines—Continued		
All other p-phenylenediamines, substituted	No	KPI, USR.
Other amines:		
p-Anilinophenol	No	BFG.
1,2-Dihydro-2,2,4-trimethylquinoline	No	BFG, MON, USR.
N-(1,4-Dimethylpentyl)-N-phenyl-para-phenylenediamine	No	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:		
Phosphites:		
Alkylaryl phosphites mixed	No	FER, GE.
Nonylphenyl phosphites, mixed	No	GE, USR.
Polymeric phosphites	No	GE.
Polyphenolic phosphites, polyalkylated	No	BFG, GE.
Triaryl phosphites	No	GE.
Polyphenolics (including bisphenols):		
Bisphenol, hindered	No	USR.
4,4'-Butyldenebis(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, RCI.
Phenol, hindered	No	FER, GYR, OMC, USR.
Phenol, styrenated, mixtures	No	NEV, USR.
N-Stearoyl-p-aminophenol	No	HXL.
All other phenolic antioxidants and stabilizers	No	USR.
All other antioxidants, antiozonants, and stabilizers, cyclic	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.
All other cyclic rubber-processing chemicals:		
p-tert-Amylphenol sulfide (Tackflier)	No	PAS.
N-(Cyclohexylthio)phthalimide	No	MON.
Diphenyl-4,4'-diphenylmethylenedipcarbamate	No	USR.
All other rubber-processing chemicals, cyclic	No	ACY, FER.
Acyclic:		
Accelerators, activators, and vulcanizing agents:		
Dithiocarbamic acid derivatives:		
Dialkyldithiocarbamic acid derivative	No	(?)
Dibutyldithiocarbamic acid, nickel salt	No	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.

See footnotes at end of table.

Table 9-2—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1989

<i>Rubber-processing chemicals</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 9-3)</i>
Acyclic—Continued		
Accelerators, activators, and vulcanizing agents—Cont.		
Dithiocarbamic acid derivatives—Continued		
Diethyldithiocarbamic acid, sodium salt	No	VNC.
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, zinc salt	No	VNC.
All other dithiocarbamic acid derivatives, acyclic	No	(²).
Thiurams:		
Bis(dibutylthiocarbamoyl) disulfide	No	VNC.
Xanthates and sulfides:		
Di-n-butylxantho disulfide	No	USR.
Zinc isopropyl xanthate	No	VNC.
All other xanthates and sulfides, acyclic	No	USR.
All other accelerators, activators, and vulcanizing agents, acyclic	No	DUP
Blowing agents, acyclic	No	(²).
Polymerization regulators:		
n-Dodecyl mercaptans	No	PAS, PLC.
tert-Nonyl mercaptan	No	PAS, PLC.
n-Octyl mercaptan	No	PAS, PLC.
All other polymerization regulators, acyclic	No	PLC, USR.
Shortstops:		
Dimethyldithiocarbamic acid, potassium salt	No	USR.
Dimethyldithiocarbamic acid, sodium salt	No	ALC, USR, VCC, VNC.
All other acyclic rubber-processing chemicals:		
Cobalt borate neodecanoate complexes	No	KCH.
Waxes and paraffinic products	No	DUP.
Zinc laurate (Activator, physical property improver, and processing auxiliary)	No	USR.
All other rubber-processing chemicals, acyclic	No	VNC.

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 9-3

Rubber-processing chemicals: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACY	American Cyanamid Co.	ICI	ICI Americas, Inc., Specialty Chemicals Div.
ALC	Alco Chemical Corp.	KCH	Manchem, Inc.
BFG	B.F. Goodrich Co., B.F. Goodrich Chemical Group	KPI	Kenrich Petrochemicals, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept.	MON	Monsanto Co.
.	Polymer Products Dept.	NEV	Neville Chemical Co.
FER	Ferro Corp., Bedford Chemical Div.	OMC	Olin Corp.
GE	General Electric Co., Specialty Chemical Group	PAS	Atochem North America, Inc.
GYR	Goodyear Tire & Rubber Co.	PLC	Phillips 66 Co.
HXL	Hexcel Corp., Hexcel Chemical Products	RCI	Reichhold Chemicals, Inc.
		UPM	UOP, Inc.
		USR	Uniroyal Chemical Co., Inc.
		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 1989 are shown in table 10-1.

Total U.S. production¹ of synthetic rubber in 1989 amounted to 2,091 million kilograms, a decrease of 6.0 percent from that produced in 1988. The production of synthetic rubber increased irregularly from 1,736 million kilograms in 1985 to 2,091 million kilograms in 1989, or by 20.4 percent. (see figure 10-1). Total sales of elastomers in 1989 amounted 1,395 million kilograms, a decrease of 4.9 percent from that sold in 1988.

Styrene-butadiene rubber (SBR-type rubber) in 1989 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 10 million kilograms of its vinylpyridine sub-type, amounted to 909 million kilograms, 1989. Polybutadiene rubber, mainly solution-polymerized type, was produced domestically in 1989 in the next largest amount—300 million kilograms. Other principal types of synthetic elastomers for which U.S. production data are reported separately are ethylene-propylene rubber, production of which was 221 million kilograms in 1989; butadiene-acrylonitrile (nitrile or NBR-type) rubber, production of which was 57 million kilograms; and thermoplastic elastomers (a family of products), production of which was 182 million kilograms in 1989.

Sales of SBR-type rubber, including 7 million kilograms of its vinylpyridine sub-type, by U.S. producers in 1989 amounted to 555 million kilograms. Sales of polybutadiene rubber amounted to 111 million kilograms, and those of ethylene-propylene rubber to 192 million kilograms. Sales of nitrile or NBR-type rubber amounted to 44 million kilograms, silicone type elastomer sales amounted to 40 million kilograms, and sales of thermoplastic elastomers amounted to 160 million kilograms in 1989.

Table 10-2 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 10-3.

Edward J. Taylor

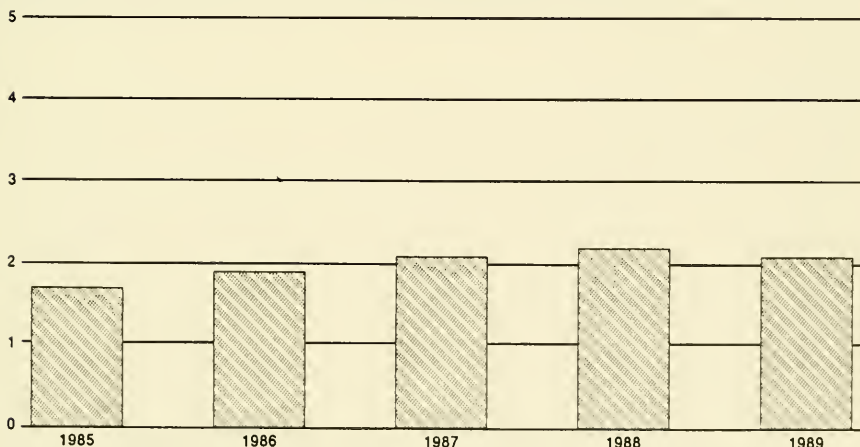
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¹ Until now urethane type elastomers have been included in the section VIII "Plastics and Resin Materials." The Commission has now begun reporting statistics for urethane elastomers in two sections, section VIII, plastics and resin materials, and section 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 10-1
Elastomers: U.S. production, 1985-89

Billions
of kilograms



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

Table 10-1

Elastomers (synthetic rubber):¹ U.S. production and sales, 1989

Elastomers	Production ²	Sales		Average Unit value ³
		Quantity ²	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	2,091,080	1,394,902	2,872,241	\$2.06
Butadiene-acrylonitrile type (nitrile) (NBR-type)	56,513	44,262	93,633	2.12
Ethylene-propylene type (EP-type)	220,932	191,831	409,573	2.14
Polybutadiene type (BR-type)	300,414	111,000	115,752	1.04
Silicone (Q) type elastomers	51,959	39,957	354,523	8.87
Styrene-butadiene type (SBR-type) ⁴	899,297	548,123	629,629	1.15
Styrene-butadiene-vinylpyridine type	10,054	6,876	15,363	2.23
Thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, thermoplastic polyurethane elastomers, and co-polyesters)	182,010	159,508	482,602	3.03
All other elastomers ⁵	369,901	293,345	771,166	2.63

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 About four-fifth of SBR elastomer production is the dry type of product.

⁵ Includes butyl, chlorinated natural rubber, chlorinated polyethylene, epichlorohydrin, fluoroelastomers, polyacrylic ester type, polychloroprene (neoprene) type, polyisoprenes (including cyclorubber), polysulfide, and miscellaneous elastomers.

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

Table 10-2

Elastomers for which U.S. production and/or sales were reported, identified by manufacturer, 1989

<i>Elastomers</i>	<i>Separate statistics¹</i>	<i>Manufacturers' identification codes (according to list in table 10-3)</i>
Cyclic		
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, GNT, GYR, MMM.
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 copolyester)	Yes	BFG, DOW, EEP, ENJ, FRS, GEP, HCL, MON, SHC.
All other cyclic elastomers	No	TNA.
Acyclic		
Butadiene-acrylonitrile (nitrile) (NBR) type	Yes	BFG, CPY, GYR, MMM, USR.
Butyl(isobutylene-isoprene) type	No	ENJ.
Chlorinated rubber, natural and synthetic	No	HPC.
Chlorosulfonated polyethylene (CSM) type	No	DUP.
Ethylene-propylene (EP) type	Yes	CPY, DUP, ENJ, USR.
Fluorelastomers (CFM, FKM, FFKM) type	No	DUP, MMM.
Polyacrylic (ACM) type elastomers	No	ACY, BFG.
Polyalkylene oxide	No	PRC.
Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)	No	ASY.
Polybutadiene (BR) type:	Yes	
Polybutadiene, emulsion-polymerized	No	GYR, RCI, SPO.
Polybutadiene, solution-polymerized	No	FRS, GYR, PLC.
All other polybutadiene (BR) type elastomers	No	FRS, RCI.
Polychloroprene (Neoprene) (CR) type	No	DKA, DUP.
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.'

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 10-3

Elastomers (synthetic rubber): Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
ACY	American Cyanamid Co.	HCL	Hoechst Celanese Corp., Engineering Plastics Div.
ASY	American Synthetic Rubber Corp.	HPC	Hercules, Inc.
BAS	BASF Corp.	LC	Lord Corp., Chemical Products Group
BFG	B. F. Goodrich Co.	MMM	Minnesota Mining and Manufacturing Co.
CPY	Copolymer Rubber & Chemical Corp.	MON	Monsanto Co.
DCC	Dow Corning Corp.	MRT	Morton International, Inc., Morton Chemical 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	Reichold Chemicals, Inc.
EEP	Furon Company	SHC	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 Synpol Co., Div. of Uniroyal Goodrich Tire Co.
GEP	General Electric Co., Plastic Div.	SWS	Wacker Silicones Corp.
GNT	Gencorp Polymers Products	TNA	Ethyl Corp
GRD	W. R. Grace & Co., Organic Chemicals Div.	USR	Uniroyal Chemical Co., Inc.
	Polymers & Chemical Div.		
GYR	Goodyear Tire & Rubber 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 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 11-1 presents statistics on U.S. production and sales of plasticizers in as great detail as is possible without revealing the operations of individual producers.

U.S. production of plasticizers totaled 976 million kilograms in 1989, a decrease of 6.4 percent from the 1,043 million kilograms reported for 1988. The trend of production of these products is shown in the graph in figure 11-1. Sales of plasticizers totaled 837 million kilograms, valued at \$1,046 million, in 1989 compared with 850 million kilograms, valued at \$1,001 million, in 1988.

Production of cyclic plasticizers in 1989, which consisted chiefly of the esters of phthalic anhydride, phosphoric acid, and trimellitic acid, amounted to 735 million kilograms, an decrease

of 8.7 percent from the 805 million kilograms reported for 1988. Sales of cyclic plasticizers in 1989 totaled 634 million kilograms, valued at \$704 million, compared with 653 million kilograms, valued at \$700 million, in 1988. The most important cyclic plasticizers were the dioctyl phthalates, with production of 139 million pounds, in 1989.

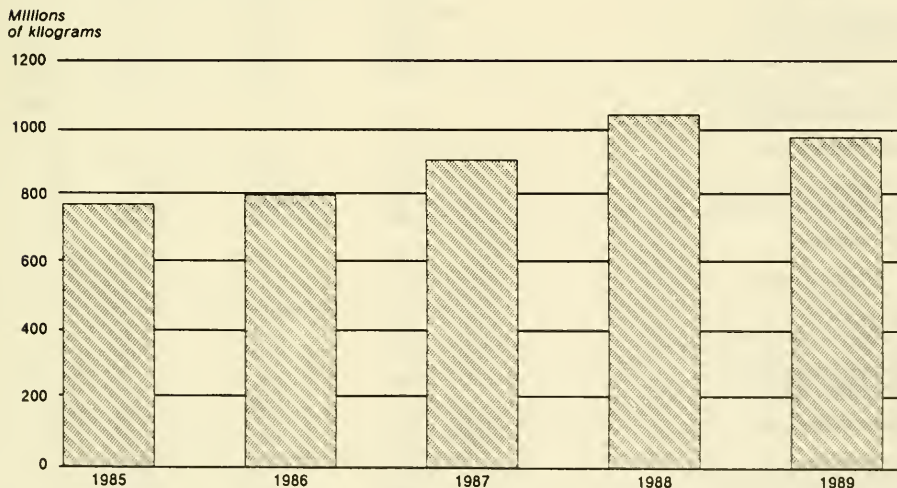
Production of acyclic plasticizers in 1989 totaled 242 million kilograms, an increase of 1.4 percent from the 239 million kilograms reported for 1988. Sales of acyclic plasticizers totaled 202 million kilograms, valued at \$342 million, in 1989, compared with 197 million kilograms, valued at \$301 million, in 1988. Adipic acid esters were the most important acyclic plasticizers in 1989 with production of 71 million kilograms.

Table 11-2 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 11-3.

Jesse Lawrence Johnson
202-252-1351

(Effective 11/14/91 202-205-3351)

Figure 11-1
Plasticizers: U.S. production, 1985-89



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

Section 11

Table 11-1

Plasticizers: U.S. production and sales, 1989

Plasticizers	Production ¹	Sales		Average Unit value ²
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	976,391	836,589	1,045,527	\$1.25
Benzenoid ³	840,230	710,565	836,872	1.18
Nonbenzenoid	136,161	126,024	208,655	1.66
Cyclic				
Total	734,653	634,202	703,942	1.11
Phthalic anhydride esters, total	660,726	559,631	567,602	1.01
Dibutyl phthalates (including diisobutyl phthalates)	9,725	8,108	9,188	1.13
Diethyl phthalates (including diisoethyl phthalates)	10,999	8,363	31,657	3.79
Dilsodecyl phthalate ⁴	84,435	82,723	75,451	.91
Dilsononyl phthalate	99,441	100,240	88,770	.89
Dimethyl phthalate (including dimethyl isophthalate)	5,187	5,266	6,565	1.25
Diocetyl phthalates ⁴	138,828	139,588	121,917	.87
DI-tridecyl phthalate	11,923	11,488	14,279	1.24
All other phthalic anhydride esters	300,188	203,855	219,775	1.08
Trimellitic acid esters	26,136	28,969	47,108	1.63
All other cyclic plasticizers ⁵	47,791	45,602	89,232	1.96
Acyclic				
Total	241,738	202,387	341,585	1.69
Adipic acid esters, total	71,101	45,639	75,506	1.65
DI(2-ethylhexyl) adipate	22,239	24,249	30,387	1.25
Dilsodecyl adipate	1,756	1,028	1,503	1.46
All other adipic acid esters	47,106	20,362	43,616	2.15
Complex linear polyesters and polymeric plasticizers	37,406	29,226	60,205	2.06
Epoxidized esters, total	62,150	63,654	85,034	1.34
Epoxidized soya oil esters	55,161	55,831	74,460	1.33
All other epoxidized esters	6,989	7,823	10,574	1.35
Myristic acid ester	1,012	1,123	4,046	3.60
Oleic acid esters, total	6,013	5,760	8,614	1.50
Butyl oleate	544	580	910	1.57
All other oleic acid esters	5,469	5,180	7,704	1.49
2-Ethylhexyl palmitate	662	702	1,538	2.19
DI(2-ethylhexyl) sebacate	4,676	1,263	4,333	3.43
Stearic acid esters, total	4,784	4,875	8,712	1.79
Isobutyl stearate	691	717	1,166	1.63
All other stearic acid esters	4,093	4,158	7,546	1.81
All other acyclic plasticizers ⁶	53,934	50,145	93,597	1.87

Table 11-1—Continued

Plasticizers: U.S. production and sales, 1989

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), 1989*, 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 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 11-2

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Plasticizers	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11-3)
Cyclic	Yes	
N-n-butyl benzenesulfonamide	No	UTC.
Diethylene glycol dibenzoate	No	KLM, VEL.
Dipropandiol dibenzoate (Dipropylene glycol dibenzoate)	No	KLM, VEL.
N-Ethyl-p-toluenesulfonamide	No	NES, TNA, UTC.
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, SCP, SM.
Phthalic anhydride esters:	Yes	
Bis(2-ethylhexyl)terephthalate	No	EKT.
Butyl benzyl phthalate	No	MON.
Butyl 2-ethylhexyl phthalate	No	BAS.
Butyl octyl phthalate	No	ART.
Di(2-butoxyethyl) phthalate	No	HAL.
Dibutyl phthalate (including diisobutyl phthalate)	No	ART, BAS, EKT, MRF, NOD, UTC, WTH.
Dicyclohexyl phthalate	No	UTC, (2).
Diethylene glycol phthalate	No	CMB.
Diethyl isophthalate	No	(2).
Diethyl phthalate	No	EKT, MON, MRF.
Di-(n-heptyl-n-nonyl) phthalate	No	BAS, SC.
Di-(n-heptyl-n-nonyl) undecyl phthalate	No	BAS, ENJ, SC.
Dilsodecyl phthalate	Yes	ART, BAS, ENJ, HCC, MON, NOD, TEK.
Dilsohexyl phthalate	No	ENJ.
Dilsononyl phthalate	Yes	ART, BAS, ENJ, TEK.
Dimethyl isophthalate	No	UTC, (2).
Dimethyl phthalate	No	EKT, MRF, UTC, WTC.
Dinonyl phthalate	No	ENJ, MRF, SC.
Dinonyl undecyl phthalate	No	TEK.
Di-tridecyl phthalate	Yes	ART, ENJ, HCC, NOD, SM, TEK.
Dlundecyl phthalate	No	ART, BAS, SC, TEK.
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) phthalate	No	ART, BAS, EKT, ENJ, HCC, TEK.
Dilso-octyl phthalate	No	ENJ, HAL, HCC, NOD, TEK.
Di-n-octyl phthalate	No	EK.
All other dioctyl phthalates	No	BAS, HCC.
Glycol phthalate esters:	No	
Butyl phthalyl butyl glycolate	No	HAL, (2).
All other glycol phthalate esters	No	HAL.
All other phthalic anhydride esters	Yes	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.
Trilsononyl trimellitate	No	ART, TEK.
Trilso-octyl trimellitate	No	ENJ, HAL, NOD, TEK.
Trimethyl trimellitate	No	FER, (2).
Tri-n-octyl n-decyl trimellitate	No	HAL.
Trloctyl trimellitate	No	ART, EKT, HAL.
All other trimellitic acid esters	No	ART, BAS, TEK, (2), (2).
All other cyclic plasticizers	No	BOE, NEV, NOD, UTC.

See footnotes at end of table.

Table 11-2—Continued

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Plasticizers	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11-3)
Acylic	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, CAS, EKT, ENJ, HAL, HCC, MON, MRF, NOD, TEK, WTH.
Di-n-hexyl adipate	No	EKT, MON.
Dilsobutyl adipate	No	HAL, WTC. (2).
Dilsodecyl adipate	Yes	HAL, HCC, NOD.
Dilsononyl adipate	No	ART, ENJ, TEK.
Dilso-octyl adipate	No	HAL, HCC.
Dileopropyl adipate	No	VND, WTH.
Dimethyl adipate	No	MRF. (2).
Di-n-octyl adipate	No	WTH.
Di-tridecyl adipate	No	HCC, NOD, SM, WM.
Ethylene glycol adipate	No	HAL.
Neopentyl glycol adipate	No	HAL.
n-Octyl n-decyl adipate	No	HCC.
All other adipic acid esters	Yes	HAL, MON, PCI, SCP, WM, WTC.
Azelic acid esters:	No	
Di(2-ethylhexyl) azelate	No	HAL, SCP, TEK.
All other azelac acid esters	No	SCP.
Citric and acetylcitric acid esters:	No	
Tributyl acetyl citrate	No	UTC.
Tributyl citrate	No	(2).
Triethyl acetyl citrate	No	(2).
Triethyl citrate	No	(2).
All other citric and acetylcitric acid esters	No	CCL. (2).
Complex linear polyesters and polymeric plasticizers:	Yes	
Adipic acid type complex linear polyesters and polymeric plasticizers	No	HAL, MRF, SCP, TEK, WTC, WTH.
All other complex linear polyesters and polymeric plasticizers	No	EKX, HPC, SBC, SCP, SM, TEK, VND, WTC.
Epoxidized esters:	Yes	
Epoxidized linseed oils	No	UCC, VIK, WTC.
Epoxidized pentaerythritol tetraphthalate	No	UCC.
Epoxidized soya oils	Yes	FER, FMB, TEK, UCC, VIK, WTC.
2-Ethylhexyl epoxytallate	No	UCC, WTC.
All other epoxidized esters	Yes	REZ, UCC, VIK, EKT.
Glyceryl tripropionate	No	
Glutaric acid esters:	No	
Neopentyl glycol glutarate	No	HAL.
All other glutaric acid esters	No	HAL.
Lauric acid esters	No	HAL.
Myristic acid esters:	Yes	
Isopropyl myristate	No	CAS, WM, WTH.
All other myristic acid esters	No	CAS, SCP, WTH.
Octandic acid esters:	No	
2-Butoxyethyl oleate	No	HAL.
Oleic acid esters:	Yes	
Butyl oleate	No	HAL, SCP, WTC, WTH.
Decyl oleate	No	SBC, SCP, VND.
2-Ethylhexyl oleate	No	HAL.
Glyceryl trioleate (Triolein)	No	SCP, WTC.
Isobutyl oleate	No	SBC.
Iso-octyl oleate	No	HAL.
Methyl oleate	No	SCP, WTC.
Neopentyl glycol dioleate	No	HCC.
Oleyl oleate	No	CAS, SBC.

See footnotes at end of table.

Table 11-2—Continued

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Plasticizers	Separate statistics ¹	Manufacturers' identification codes (according to list in table 11-3)
Acyclic	Yes	
Oleic acid esters—Continued	Yes	
Propyl oleates:		
n-Propyl oleate	No	SCP.
Trimethylolpropane trioleate	No	HCC.
All other oleic acid esters	No	HAL.
Palmitic acid esters:		
2-Ethylhexyl palmitate	Yes	VND, WM, WTH.
Isopropyl palmitate	No	CAS, WM, WTH.
All other palmitic acid esters	No	SBC.
Pelargonic acid esters:	No	
Glycol pelargonate	No	SCP.
Isodecyl pelargonate	No	SCP.
All other pelargonic acid esters	No	CAS, HCL, SBC, WM.
Phosphoric acid esters:	No	
Tri(2-butoxyethyl) phosphate	No	FMC, MON.
Tributyl phosphate	No	FMC.
Triethyl phosphate	No	EKT.
Ricinoleic and acetylricinoleic acid esters:	No	
n-Butyl acetylricinoleate	No	CAS.
Butyl ricinoleate	No	CAS.
Glyceryl monoricinoleate	No	CAS.
Glyceryl tri(acetylricinoleate)	No	CAS.
Methyl ricinoleate	No	CAS, SCP.
Propylene glycol monoricinoleate	No	CAS.
All other ricinoleic and acetylricinoleic acid esters	No	CAS.
Sebacic acid esters:	No	
Dibutoxyethyl sebacate	No	HAL.
Dibutyl sebacate	No	HAL, WM, (²).
Di(2-ethylhexyl) sebacate	Yes	HAL, HCC, TEK, (²).
Dilsopropyl sebacate	No	SBC, (²).
Dimethyl sebacate	No	SCP, (²), (²).
Propylene glycol sebacate	No	HAL.
Stearic acid esters:	Yes	
n-Butyl stearate	No	SCP, WM, WTC, WTH.
Diethylene glycol succinate	No	CMB.
2-Ethylhexyl stearate	No	CAS, HCL, WM.
Glyceryl triacetyl stearate	No	CAS.
Hexadecyl stearate	No	HCL.
Isobutyl stearate	Yes	SCP, WM, WTC, WTH.
Isopropyl stearate	No	CAS.
Myristyl stearate	No	VND.
2-Octyldecyl-12-stearoyl stearate	No	VND.
Tridecyl stearate	No	HCC, WM.
All other stearic acid esters	Yes	CAS, SBC, SCP, VND, WM, WTC.
Sucrose acetate isobutyrate	No	EKT, UCC.
Tetraethylene glycol di(2-ethylhexanoate)	No	HAL.
Triethylene glycol di(caprylate-caprate)	No	HAL.
Triethylene glycol di(2-ethylbutyrate)	No	HAL.
Triethylene glycol di(2-ethylhexanoate)	No	EKT, HAL.
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	No	EKX.
All other acyclic plasticizers	Yes	ARZ, HCC, HCL, HPC, SCP, WM, WTC.

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 11-3

Plasticizers: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
ART	Aristech Chemical Corp., Chemical Div.	MRF	Morflex Chemical Co., inc.
ARZ	Arizona Chemical Co.	NES	Ruetgers-Nease Chemical Co.
BAS	BASF Corp.	NEV	Neville Chemical Co.
BOE	Boehme Filatex, Inc.	NOD	Huis America, Inc.
CAS	CasChem, Inc.	PCI	Piedmont Chemical Industries, Inc.
CCL	Catawba-Charlab, Inc.	REZ	HI-Tek Polymers, Inc.
CMB	Cambridge Industries Co.	SBC	Scher Chemicals, Inc.
EK	Eastman Kodak Co.:	SC	Sterling Chemical, Inc.
EKT	Tennessee Eastman Co. Div.	SCP	Henkel Corp.
EKX	Texas Eastman Co. Div.	SM	Mobil Oil Corp. Chemical Products Div.
ENJ	Exxon Chemical Americas	TEK	Teknor Apex Co.
FER	Ferro Corp.:	TNA	Ethyl Corp.
	Bedford Chemical Div.	UCC	Unlon Carbide Corp., Industrial Chemicals Div.
	Grant Chemical Div.	UTC	Unitex Chemical Corp.
FMB	FMC Corp., Chemical Products Group	VEL	Vescol Chemical Corp.
FMC	FMC Corp., Nitro Div.	VIK	M & T Chemicals, Inc.
HAL	C. P. Hall Co.	VND	Van Dyk Div. of Mallinckrodt, Inc.
HCC	Hatco Chemical Corp.	VST	Vista Chemical Co.
HCL	Hoechst Celanese Corp., Sou-Tex Works	WM	Inolex Chemical Co.
HPC	Hercules, Inc.	WTC	Witco Chemical Corp.
KLM	Kalama Chemical, Inc.	WTH	Unlon Camp Corp., Chemical Div.
MON	Monsanto 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 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 12-1) 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 the production of surface-active agents during 1985-89 are shown in figure 12-1.

Total U.S. production of surface-active agents in 1989 amounted to 3,085 million kilograms, or 7 percent less than the 3,319 million kilograms reported for 1988. Sales of bulk surface-active agents in 1989 amounted to 1,724 million kilograms, valued at \$2,086 million, compared with sales in 1988 of 1,933 million kilograms,

valued at \$2,303 million. In terms of quantity, sales in 1989 were 11 percent less than in 1988.

Production of anionic surface-active agents in 1989 amounted to 2,031 million kilograms, or 66 percent of the total surfactant output reported for 1989. Sales of anionics in 1989 amounted to 870 million kilograms, valued at \$612 million.

Production of cationic surface-active agents in 1989 amounted to 293 million kilograms, 8 percent less than the 319 million kilograms reported in 1988. Production of nonionic surface-active agents amounted to 743 million kilograms in 1989, 20 percent less than the 913 million kilograms reported in 1988. Sales of cationic surface-active agents in 1989 decreased by 7 percent in terms of quantity, and by 2 percent in terms of value when compared with sales as reported in 1988. Sales of nonionics in 1989 decreased by 16 percent in terms of quantity, and by 15 percent in terms of value when compared with sales as reported in 1988.

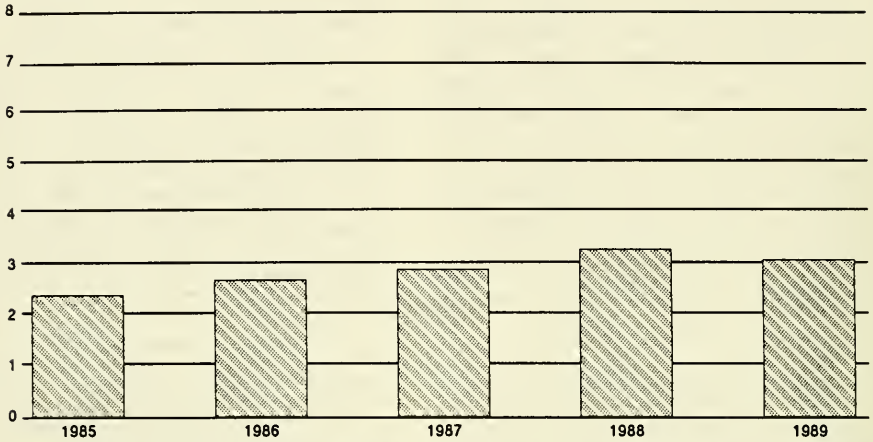
The difference between production and sales reflects inventory changes and captive consumption of surface-active agents by synthetic rubber producers, and by manufacturers of cosmetics, packaged detergents, bar soaps, and other formulated consumer products. In some instances the difference may also reflect 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 phosphation or sulfation.

Table 12-2 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 12-3.

Eric Land
202-252-1349
(Effective 1/14/91 202-205-3349)

Figure 12-1
Surface-active agents: U.S. production, 1985-89

Billions
of kilograms



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

Table 12-1
Surface-active agents: U.S. production and sales, 1989

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	3,085,374	1,724,035	2,085,847	\$1.21
Benzenoid ⁴	651,765	350,322	500,429	1.43
Nonbenzenoid	2,433,609	1,373,713	1,585,418	1.15
Amphoteric				
Total	17,853	16,234	34,100	2.10
(Carboxymethyl) [3-(coconut oil amido)propyl] dimethylammonium hydroxide, inner salt	1,884	1,657	4,105	2.48
N-Dodecyl-3-iminodipropionic acid, disodium salt	98	98	327	3.34
(Mixed alkyl) sulfobetaine	204	176	388	2.20
All other amphoteric surface active agents	15,667	14,303	29,280	2.05
Anionic				
Total	2,031,362	870,371	612,217	.70
Carboxylic acids (and salts thereof), total	499,264	98,486	101,772	1.03
Amine salts of fatty, rosin, and tall oil acids	2,478	1,848	3,415	1.85
Coconut oil acids, potassium salt	(⁵)	688	4,996	7.28
Coconut oil acids, sodium salt	92,434	3,698	3,847	1.04
Oleic acid, sodium salt	35	34	61	1.79
Rosin acids, potassium salt	35,227	36,347	22,243	.61
Stearic acid, sodium salt	(⁵)	23	39	1.70
Tall oil acids, potassium salt	4,271	1,055	1,185	1.12
Tallow acids, sodium salts	196,917	17,623	10,525	.60
All other carboxylic acids (and salts thereof)	167,902	37,170	55,461	1.49
Phosphoric and polyphosphoric acid esters (and salts thereof), total	35,149	21,244	48,172	2.27
Alcohols and phenols, alkoxylated and phosphated, total ..	27,860	16,388	35,024	2.14
Dinonylphenol, ethoxylated and phosphated	733	517	1,226	2.37
Mixed linear alcohols, ethoxylated and phosphated	2,051	1,563	3,972	2.54
Nonylphenol, ethoxylated and phosphated	3,922	3,096	6,948	2.24
Phenol, ethoxylated and phosphated	799	867	1,675	1.93
Tridecyl alcohol, ethoxylated and phosphated	2,569	1,754	3,457	1.97
All other alcohols and phenols, alkoxylated and phosphated	17,786	8,591	17,746	2.07
Decyl and octyl phosphate	826	743	1,607	2.16
2-Ethylhexyl phosphate	605	404	887	2.20
Hexyl phosphate	132	127	323	2.54
Mixed alkyl phosphate	1,115	875	2,665	3.05
All other phosphoric and polyphosphoric acid esters (and salts thereof)	4,611	2,707	7,666	2.83
Sulfonic acids (and salts thereof), total	1,075,203	614,595	287,991	.47
Alkylbenzenesulfonates, total	346,834	87,389	113,996	1.30
Dodecylbenzenesulfonic acid	195,075	48,668	56,556	1.16
Dodecylbenzenesulfonic acid, calcium salt	2,678	2,303	7,359	3.20
Dodecylbenzenesulfonic acid, isopropylamine salt	2,330	1,805	3,619	2.00
Dodecylbenzenesulfonic acid, monoethanolamine salt	51	51	158	3.10
Dodecylbenzenesulfonic acid, sodium salt	81,154	26,707	35,563	1.33
Dodecylbenzenesulfonic acid, triethanolamine salt	6,530	6,536	8,563	1.31
All other alkylbenzene sulfonates	59,016	1,319	2,178	1.65
Benzene-, cumene-, toluene-, and xylenesulfonates, total	63,511	53,308	30,062	.56
Xylenesulfonic acid, sodium salt	39,644	35,894	19,174	.53
All other benzene-, cumene-, toluene-, and xylenesulfonates	23,867	17,414	10,888	.63

See footnotes at end of table.

Table 12-1—Continued
 Surface-active agents: U.S. production and sales, 1989

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Anionic—Continued				
Sulfonic acids (and salts thereof)—Continued				
Ligninsulfonates and naphthalenesulfonates, total	581,282	445,378	77,459	\$0.17
Ligninsulfonic acid, ammonium salt	(⁴)	2,377	560	.24
Ligninsulfonic acid, calcium salt	246,337	254,674	27,484	.11
Ligninsulfonic acid, sodium salt	302,856	157,591	29,787	.19
All other ligninsulfonates and naphthalene-sulfonates	32,089	30,736	19,628	.64
Mixed linear olefin sulfonate	10,270	10,070	14,448	1.43
Sulfosuccinamic acid derivatives	1,640	1,586	2,462	1.55
Sulfonic acids having ester or other linkages, total	64,216	12,597	38,479	3.05
Sulfosuccinic acid esters, total	12,659	10,863	27,229	2.51
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	9,473	8,400	21,090	2.51
All other sulfosuccinic acid esters	3,186	2,463	6,139	2.49
All other sulfonic acids having ester or ether linkages	51,557	1,734	11,250	6.49
All other sulfonic acids (and salts thereof)	7,450	4,267	11,085	2.60
Sulfuric acid esters (and salts thereof), total ⁵	421,746	136,046	174,282	1.28
Acids, amides, and esters, sulfated, total	4,462	3,467	6,325	1.82
Butyl oleate, sulfated, sodium salt	427	406	527	1.30
All other acids, amides, and esters, sulfated	4,035	3,061	5,798	1.89
Alcohols, sulfated, total	163,180	42,204	61,911	1.47
Decyl sulfate, sodium salt	646	418	505	1.21
Dodecyl sulfate, ammonium salt	14,184	7,864	12,967	1.65
Dodecyl sulfate, magnesium salt	202	37	145	3.92
Dodecyl sulfate, sodium salt	10,798	10,607	23,045	2.17
Dodecyl sulfate, triethanolamine salt	3,081	2,310	5,380	2.33
2-Ethylhexyl sulfate sodium salt	876	876	2,202	2.51
All other alcohols, sulfated	133,393	20,092	17,667	.88
Ethers, sulfated, total ⁶	241,531	79,464	95,474	1.20
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	382	382	984	2.58
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	5,006	5,006	11,365	2.27
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	60,382	7,707	10,477	1.36
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	98,554	17,188	23,040	1.34
All other ethers, sulfated ⁶	77,207	49,181	49,608	1.01
Natural fats and oils, sulfated, total	12,573	10,911	10,572	.97
Castor oil, sulfated, sodium salt	2,237	2,014	3,573	1.77
Lard, sulfated sodium salt	1,003	(⁵)	(⁵)	(⁵)
Mixed fish oils, sulfated, sodium salt	279	279	222	.80
Tall oil, sulfated, sodium salt	634	586	571	.97
Tallow, sulfated, sodium salt	201	162	176	1.09
All other natural fats and oils, sulfated	8,219	7,870	6,030	.77
Cationic				
Total	292,775	170,219	375,416	2.21
Amine oxides and oxygen-containing amines (except those having amide linkages), total				
	67,474	25,403	54,623	2.15
Acyclic, total				
(Coconut oil alkyl)amine, ethoxylated	63,398	22,567	45,243	2.00
(Hydrogenated tallow alkyl)amine, ethoxylated	2,792	2,527	3,412	1.35
(9-Octadecenyl)amine, ethoxylated	492	500	894	1.79
(9-Octadecenyl)amine, ethoxylated	961	885	1,780	2.01
Octadecylamine, ethoxylated	615	572	1,636	2.86
(Soybean oil alkyl)amine, ethoxylated	173	187	550	2.94
(Tallow alkyl)amine, ethoxylated	3,572	3,281	7,500	2.29

See footnotes at end of table.

Table 12-1—Continued

Surface-active agents: U.S. production and sales, 1989

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Cationic—Continued				
Amine oxides and oxygen-containing amines (except those having amide linkages)—Continued				
Acyclic—Continued				
N-(Tallow alkyl) trimethylene diamine, ethoxylated	424	323	740	\$2.29
All other acyclic amine oxides and oxygen containing amines (except those having amide linkages)	54,369	14,292	28,731	2.01
Cyclic (including imidazoline and oxazoline derivatives), total	4,078	2,836	9,380	3.31
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	436	441	1,432	3.25
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	705	225	1,728	7.68
All other cyclic amine oxides and oxygen containing amines (except those having amide linkages)	2,935	2,170	6,220	2.87
Amines and amine oxides having amide linkages	22,105	17,818	28,057	1.57
Amines, not containing oxygen (and salts thereof), total	103,531	40,179	75,670	1.88
Amine salts	1,798	1,773	3,469	1.96
Amine salts, diamines and polyamines	11,623	8,366	13,832	1.65
Monoamines, total	90,112	30,040	58,369	1.94
(Coconut oil alkyl)amine	4,206	443	1,120	2.53
N,N-Dimethyloctadecylamine	588	253	707	2.79
(Hydrogenated tallow alkyl)amine	3,988	1,884	2,714	1.44
Methyl didecylamine	758	185	616	3.33
9-Octadecenylamine	3,126	1,662	3,166	1.90
Octadecylamine	434	463	1,203	2.60
(Soybean oil alkyl)amine	2,857	2,400	3,212	1.34
(Tallow alkyl)amine	(⁹)	5,710	6,913	1.21
All other monoamines	74,157	17,040	38,718	2.27
Quaternary ammonium salts, containing oxygen, total	20,718	18,039	43,145	2.39
(Coconut oil alkyl)bis(2-hydroxyethyl, ethoxylated)-methylammonium chloride	152	148	415	2.84
All other quaternary ammonium salts, containing oxygen	20,564	17,893	42,730	2.39
Quaternary ammonium salts, not containing oxygen, total	73,943	66,994	146,005	2.18
Acyclic, total	61,267	58,348	125,674	2.15
Bis(coconut oil alkyl)dimethylammonium chloride	1,451	1,428	3,925	2.75
Bis(hydrogenated tallow alkyl)dimethylammonium chloride	34,271	31,589	57,659	1.83
N-(coconut oil alkyl) aminobutyric acid, sodium salt	1,065	1,050	3,558	3.39
All other acyclic quaternary ammonium salts, not containing oxygen	24,480	24,281	60,532	2.49
Benzenoid, total ⁴	12,676	8,646	20,331	2.35
Benzyl(coconut oil alkyl)dimethylammonium chloride	557	536	1,092	2.04
Benzyl(mixed alkyl)ammonium chloride	2,833	2,757	6,077	2.93
Benzyl(mixed alkyl)octadecyl ammonium chloride	297	88	433	4.94
Benzyltrimethylammonium chloride	1,783	1,265	2,213	1.75
All other benzenoid quaternary ammonium salts, not containing oxygen	7,206	4,000	8,516	2.13
All other cationic surface-active agents	5,006	1,786	27,916	15.63

See footnotes at end of table.

Table 12-1—Continued
 Surface-active agents: U.S. production and sales, 1989

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Nonionic—Continued				
Total	743,384	667,211	1,064,114	\$1.59
Carboxylic acid amides, total	35,154	31,665	59,436	1.88
Diethanolamine condensates, amine/acid ratio = 2/1, total	8,171	7,780	14,039	1.80
Coconut oil acids	1,463	1,408	2,593	1.84
Coconut oil and tallow acids	4,222	4,220	7,917	1.88
Lauric and myristic acids	138	(⁶)	(⁶)	(⁶)
Oleic acid	295	252	482	1.91
Stearic acid	22	28	66	2.36
Tall oil acids	859	824	699	.85
All other diethanolamine condensates, amine/acid ratio = 2/1	1,172	1,050	2,282	2.17
Diethanolamine condensates (other amine/acid ratios), and other carboxylic acid amides, total	17,051	15,240	26,733	1.75
Coconut oil acids, amine/acid ratio = 1/1	12,996	11,860	18,839	1.57
Lauric acid, amine/acid ratio = 1/1	931	875	2,087	2.38
Lauric and myristic acids, amine/acid ratio = 1/1	460	458	1,255	2.74
Linoleic acid, amine/acid ratio = 1/1	111	(⁶)	(⁶)	(⁶)
Stearic acid, amine/acid ratio = 1/1	69	45	94	2.09
All other diethanolamine condensates (other amine/acid ratios), and other carboxylic acid amides	2,484	2,002	4,858	2.33
Other alkanolamine condensates	9,932	8,645	18,664	2.16
Carboxylic acid esters, total	158,528	122,550	233,880	1.91
Anhydrosorbitol esters, total	19,543	18,454	28,319	1.72
Anhydrosorbitol monolaurate	3,325	2,770	5,672	2.05
Anhydrosorbitol mono-oleate	8,050	3,621	6,305	1.74
Anhydrosorbitol monostearate	6,461	6,573	10,082	1.53
Anhydrosorbitol sesquileate	386	404	792	1.96
Anhydrosorbitol trioleate	2,079	1,932	3,284	1.70
All other anhydrosorbitol esters	1,242	1,154	2,184	1.89
Diethylene glycol esters, total	3,271	2,419	2,927	1.21
Diethylene glycol monolaurate	116	123	181	1.47
Diethylene glycol monostearate	29	29	75	2.55
All other diethylene glycol esters	3,128	2,267	2,671	1.18
Ethoxylated anhydrosorbitol esters, total	14,558	13,981	29,847	2.13
Ethoxylated anhydrosorbitol monolaurate	3,128	2,966	8,718	2.26
Ethoxylated anhydrosorbitol mono-oleate	4,540	4,539	9,143	2.01
Ethoxylated anhydrosorbitol monostearate	5,012	4,840	10,246	2.12
Ethoxylated anhydrosorbitol trioleate	1,264	992	2,207	2.22
Ethoxylated anhydrosorbitol tristearate	285	295	632	2.15
All other ethoxylated sorbitol and anhydrosorbitol esters	329	349	901	2.58
Ethoxylated sorbitol esters	1,563	1,541	3,784	2.46
Ethylene glycol distearate	2,106	2,003	3,348	1.67
Ethylene glycol monostearate	1,692	1,550	2,728	1.76
Glycerol esters, total	48,651	33,772	64,313	1.90
Glycerol mono-oleate	4,011	3,608	6,448	1.79
Glycerol monostearate	10,668	6,274	11,004	1.75
All other glycerol esters	33,972	23,890	46,861	1.96
Natural fats and oils, ethoxylated, total	17,842	13,974	28,733	2.06
Castor oil, ethoxylated	7,176	6,287	11,659	1.85
Hydrogenated castor oil, ethoxylated	1,924	1,531	3,321	2.17
Lanolin, ethoxylated	652	641	1,050	1.64
Tall oil acids, ethoxylated	621	228	358	1.57
All other natural fats and oils, ethoxylated	7,469	5,287	12,345	2.33
Polyethylene glycol esters, total	27,312	21,618	42,062	1.95
Polyethylene glycol diester of tall oil acids	2,196	321	604	1.88
Polyethylene glycol dilaurate	547	510	1,139	2.23
Polyethylene glycol dioleate	1,858	697	1,344	1.93

See footnotes at end of table.

Table 12-1—Continued

Surface-active agents: U.S. production and sales, 1989

Surface-active agents	Production ¹	Sales ²		Average Unit value ³
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Nonionic—Continued				
Carboxylic acid esters—Continued				
Polyethylene glycol esters—Continued				
Polyethylene glycol distearate	1,044	981	2,833	\$2.89
Polyethylene glycol monoester of coconut oil acids	112	108	228	2.15
Polyethylene glycol monoester of tall oil acids	625	(⁶)	(⁶)	(⁶)
Polyethylene glycol monolaurate	3,456	3,292	5,595	1.70
Polyethylene glycol mono-oleate	1,878	1,582	3,210	2.03
Polyethylene glycol monopalmitate	648	776	1,085	1.40
Polyethylene glycol monopelargonate	1,494	(⁶)	(⁶)	(⁶)
Polyethylene glycol monostearate	2,819	2,716	5,709	2.10
Polyethylene glycol sesquieater of tall oil acids	906	867	1,511	1.74
All other polyethylene glycol esters	9,729	9,770	18,804	1.92
Polyglycerol esters, total	620	526	1,764	3.35
Polyglycerol mono-oleate	369	301	867	2.98
All other polyglycerol esters	251	225	897	3.86
1,2-Propanediol monostearate	848	453	1,150	2.54
All other carboxylic acid esters	18,522	14,259	24,905	1.75
Ethers, total	537,069	507,109	747,925	1.47
Benzenoid ethers, total⁴				
Dinonylphenol, ethoxylated	190,876	172,225	274,767	1.60
Dinonylphenol, ethoxylated	2,101	2,512	3,589	2.37
Dodecylphenol, ethoxylated	1,728	1,556	3,191	2.05
Iso-octylphenol, ethoxylated	25,391	17,358	44,596	2.57
(Mixed alkyl)phenol-formaldehyde, alkoxylated	6,560	(⁶)	(⁶)	(⁶)
Nonylphenol, ethoxylated	136,845	134,642	181,573	1.35
Nonylphenol, ethoxylated and propoxylated	653	603	1,563	2.59
Nonylphenol-formaldehyde, alkoxylated	2,069	(⁶)	(⁶)	(⁶)
All other benzenoid ethers	15,529	18,554	40,255	2.43
Nonbenzenoid ethers, total				
Chemically-defined linear alcohols, ethoxylated, total	304,615	300,779	402,106	1.34
Decyl alcohol, ethoxylated	11,471	11,153	25,329	2.27
Dodecyl alcohol, ethoxylated	4,974	4,867	9,105	1.87
Dodecyl alcohol, ethoxylated	1,713	1,774	3,676	2.07
Hexadecyl alcohol, ethoxylated	468	509	1,436	2.82
9-Octadecenyl alcohol, ethoxylated	871	508	1,600	3.16
Octadecyl alcohol, ethoxylated	1,130	1,262	3,652	2.89
Oleyl alcohol, ethoxylated	330	300	1,077	3.59
All other chemically-defined linear alcohols, ethoxylated	1,985	1,935	4,783	2.47
Mixed linear alcohols, alkoxylated, total	293,144	289,626	376,777	1.30
Mixed linear alcohols, ethoxylated	271,186	269,234	342,232	1.27
Mixed linear alcohols, ethoxylated and propoxylated	8,424	7,794	13,382	1.72
All other mixed linear alcohols, alkoxylated	13,534	12,598	21,163	1.68
Other ethers and thioethers, total	41,578	34,105	71,052	2.08
Mixed alcohols, ethoxylated	372	307	475	1.55
Poly(mixed ethylene, propylene) glycol	5,875	1,780	3,689	2.07
Tridecyl alcohol, ethoxylated	4,023	3,331	5,321	1.60
All other ethers and thioethers	31,308	28,687	61,567	2.15
All other nonionic surface-active agents	14,633	5,887	22,873	3.89

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 12-2

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Amphoteric		
1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolium chloride, disodium salt	No	BRD.
Bis(2-hydroxyethyl)tallow ammonium ethanoate	No	MIR.
Capramidopropyl betaine	No	AAC.
3-[Caprylamidoethylene-(2-hydroxyethyl)amino]-propionic acid	No	MIR.
Caprylamphopropionate	No	MOA.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolium 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, SCP, SHX, WM, WTC, (?).
1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2, imidazolium hydroxide sodium derivative, sodium salt	No	BRD.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolium hydroxide, sodium derivative, sodium salt	No	BRD, MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolium hydroxide, sodium derivative, sodium salt	No	MIR.
(Carboxymethyl)-3-(lauryl amido propyl dimethyl ammonium hydroxide inner salt	No	MIR.
Cocoamidoamphoglycinate	No	MOA.
Cocoamidopropyl betaine	No	MOA.
N-Cocoamido-propyl-N,N-dimethylamine oxide	No	MOA.
3-[3-(Cocoamidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	No	MIR.
3-Cocoamidopropyl-2-hydroxy-3-sulfopropyldimethyl ammonium hydroxide, inner salt	No	SHX.
Cocoamphocarboxyglycinate	No	MOA.
Cocoamphocarboxypropionate	No	MOA.
Cocoamphopropionate	No	MOA.
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.
Dodecyl disodium banaline, N-(2-carboxyethyl), sodium salt	No	GAF.
N-Dodecyl-3-linodipropionic acid	No	MOA.
N-Dodecyl-3-linodipropionic acid, disodium salt	Yes	AAC, MIR, MOA, SCP.
N-Dodecyl-3-linno-dipropionic acid, monosodium salt	No	MIR.
Heptadecylmethylbenzimidazolinesulfonic acid, sodium salt	No	BRD.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Amphoteric—Continued		
Hexylsolanylamidocarboxylic acid, monoethanolamine salt	No	HCL.
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-capryl-2-imidazolium hydroxide	No	MIR.
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	No	MIR.
1-(2-Hydroxyethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-coconut oil fatty acids-2-imidazolium hydroxide	No	MIR.
Isodecyloxypropylminopropionic acid, monosodium salt	No	ENJ.
Isononylamidocaproic acid, triethanolamine salt	No	SHX.
Isostearic amphopropionate	No	MOA.
Laurylamidopropyl betaine	No	MOA.
Laurylamphoglycinate	No	MOA.
Hexylsolanylamidocarboxylic acid, monoethanolamine salt	No	HCL.
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	AAC.
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-liminodipropionic acid, disodium salt	No	MIR, MOA, SCP.
Tridecyloxypropyl(ethyleneoxy)propionic acid, potassium salt	No	MRV.
All other acyclic amphoteric surface-active agents	No	BRD, CGY, DUP, MIR, MOA, PPG, S, SCP, (2).
All other cyclic amphoteric surface-active agents	No	PPG, SBC.
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.
Coconut oil acids, triethanolamine salt	No	SCP.
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	(2).
3-Propanoic acid, cocoamine, sodium salt	No	PCI.
Rosin acids, triethanolamine salt	No	CPC.
Stearic acid, N,N,N',N'-tetrakis(2-hydroxyethyl)-ethylenediamine salt	No	ICI.
Stearic acid, triethanolamine salt	No	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).

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Carboxylic acids (and salts thereof)—Continued		
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.
Dodecyloxy poly(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-ethanedyl), ω-(2-carboxyethoxy)-ω'-hydroxy-α,α'-(iminodi-2,1-ethanedyl) bis-,N-tallow alkyl derivs., potassium salt	No	MIR.
Poly(oxy-1,2 ethanedyl)-α-carboxymethyl, ω-(tri-decyloxy), potassium salt	No	PCI.
Tridecyloxy poly(ethyleneoxy)acetic acid, sodium salt	No	FTX, HCL, HMP.
All other carboxylic acids with amide, ester or ether linkages	No	SCP, WM.
Potassium and sodium salts of fatty, rosin, and tall oil acids:		
Alkoxy triacryl titanate	No	KPI.
5(or 6)carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, potassium/sodium salts	No	(²).
Castor oil acids, potassium salt	No	CAS, DEX, GRL.
Castor oil acids, sodium salt	No	HEW.
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, PG, PLX, PNX, (²).
Corn oil acids, potassium salt	No	HNT.
Corn oil acids, sodium salt	No	NMC.
Gluconic acid, potassium and sodium salts, with a 20 percent mix of sodium bisulfite-formaldehyde	No	HCL.
Heptanoic acid, potassium salt	No	(²).
Hexyl (isononyl amide) carboxylic acid, mono-, triethanolamine salts	No	HCL.
Hexyl(isononyl amide)carboxylic acid, tri-, diethanolamine, mixed salts	No	HCL.
Isonanoic 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	CRT, EFH, GRL.
Mixed vegetable fatty acids, sodium salt	No	NPR.
Mixed wool grease and tall oil fatty acids	No	SLM.
Neoalkoxy, trineodecanoyl titanate	No	KPI.
Neoalkoxy, trineodecanoyl zirconate	No	KPI.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Carboxylic acids (and salts thereof)—Continued		
Potassium and sodium salts of fatty, rosin, and tall oil acids—Continued		
Oleic acid, ammonium salt	No	CCC.
Oleic acid, potassium salt	No	BSW, HNT, PG, VKR, WBG, (2).
Oleic acid, sodium salt	Yes	BSW, NMC, SCP, WBG.
Olive oil acids, potassium 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	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	No	CCC, CON, HEW, SCP.
Stearic acid, sodium salt	Yes	CON, CRT, LEV, PNX.
Tall oil acids, potassium salt	Yes	CCC, CON, DAN, ESS, FER, HAL, HIP, HNT, LEA, PNX, SCP, WVA.
Tall oil acids, sodium salt	Yes	NMC, WVA, (2).
Tallow acids, potassium salt	No	AGP, CRT, PG, PNX.
Tallow acids, sodium salt	Yes	BSW, CON, CP, CRT, HEW, LEV, NMC, PG, (2).
All other potassium and sodium salts of fatty, rosin, and tall oil acids	No	MOA, USR, WVA.
All other carboxylic acids	No	SCP, WVA.
Phosphoric and polyphosphoric acid esters (and salts thereof):		
Alcohols and phenols, alkoxyated and phosphated:		
C ₁₂ -C ₁₈ Alcohol, ethoxylated, propoxylated and phosphated	No	GAF.
Butyl alcohol, ethoxylated and phosphated	No	AAC.
Decyl alcohol, ethoxylated and phosphated	No	MCP, OC, RPC.
Dinonylphenol, ethoxylated and phosphated	Yes	CPC, ETC, GAF, PPG, WTC.
Dodecyl alcohol, ethoxylated and phosphated	No	CPC, ENJ, GAF, HCL.
Dodecyl alcohol, ethoxylated and polyphosphated	No	PG.
Dodecylphenol, ethoxylated and phosphated	No	DEX, 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	CPC, ETC, HCL, SCP, UTC, WTC.
2-Ethylhexanol, ethoxylated, phosphated, potassium salt	No	BRI.
Mixed linear alcohols, alkoxyated and phosphated, potassium salt	No	PCI.
Mixed linear alcohols, ethoxylated and phosphated	Yes	AAC, BAS, CTL, ENJ, ETC, FER, FTX, GAF, HCL, HIP, HRT, LUR, MOA, MRV, RPC, SOS, WTC, (2), (2).
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	No	CHP.
Mixed tridecyl alcohol and 2-ethylhexanol, phosphated, potassium salt	No	CHP.
Nonylphenol, ethoxylated and phosphated	Yes	AAC, ARL, CPC, CTL, DEX, ENJ, ESS, ETC, GAF, GDC, HCL, HDG, HRT, LEA, MCP, MOA, OC, OMC, PPG, RPC, UTC, VKR, WTC.
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	No	OMC, WTC.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued		
Alcohols and phenols, alkoxyated and phosphated—Continued		
Nonylphenol, ethoxyated and phosphated, sodium salt	No	WTC.
9-Octadecanyl alcohol, ethoxyated and phosphated	No	ETC, GAF, HCL, WTC.
Octylphenol, ethoxyated and phosphated	No	LUR, RH, RPC, WTC.
Phenol, ethoxyated and phosphated	Yes	AAC, ETC, HDG, LUR, MOA, PEL, PPG, WTC.
Polyhydric alcohol, ethoxyated and phosphated	No	AAC, DEX, GAF.
Polypropylene glycol, phosphated	No	BAS.
Tridecyl alcohol, ethoxyated and phosphated, polyalkylene polyamine salt	No	(?).
Tridecyl alcohol, ethoxyated and phosphated	Yes	CPC, DAN, DEX, ETC, GAF, HCL, HIP, MIL.
Tridecyl alcohol ethoxyated and phosphated, potassium salt	No	DEX.
All other alcohols and phenols, alkoxyated and phosphated or polyphosphated	No	ETC, SCP, SDC, TCC, (?).
Alcohols, phosphated or polyphosphated:		
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	Yes	APC, BRD, CHP, ETC, FER, HIP, LUR, MCP, OC, OMC, SOS, VKR, (?).
2-Ethylhexylphosphate, potassium salt	No	PCI.
2-Ethylhexyl phosphate, sodium salt	No	CHP, DAN, ENJ, PAT, S.
2-Ethylhexyl polyphosphate, sodium salt	No	DEX.
Hexadecylidiphosphate	No	(?).
Hexadecylmonophosphate	No	(?).
Hexyl phosphate	Yes	ETC, HCL, ICI.
Hexyl phosphate, potassium salt	No	FTX, ICI.
Isooctyl phosphate	No	BOE, BRI, QCP.
Isooctyl phosphate, potassium salt	No	QCP.
Lauryl alcohol, phosphated, potassium salt	No	BOE.
Methylbutyl pyrophosphate, ethylenedioxy titanium salt	No	KPI.
Mixed alkyl phosphate, sodium salt	No	(?).
Mixed alkyl phosphate	Yes	CTL, DUP, HCL, SCP, WTC, (?).
Mixed alkyl phosphate, alkylamine salt	No	(?).
Mixed alkyl phosphate, diethanolamine salt	No	DUP, SCP.
Mixed alkyl phosphate, potassium salt	No	HCL, QCP, (?).
Mixed alkyl phosphate, triethanolamine salt	No	(?).
Neoalkoxy tris(dioctyl)pyrophosphate zirconate	No	KPI.
Octyl phosphate	No	SCP.
Octyl phosphate, alkylamine salt	No	(?).
Octyl phosphate, isopropoxy 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, isopropoxy titanium salt	No	KPI.
Octyl pyrophosphate, neoalkoxy titanium salt	No	KPI.
Octyl pyrophosphate, oxoethylenedioxy titanium salt	No	KPI.
Octyl pyrophosphate titanium salt	No	KPI.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued		
Alcohols, phosphated or polyphosphated—Continued		
N-(2(C ₈ -C ₁₇) Alkylamido-N-carboxyethyl,N-2-hydroxyethyl, 3-amino-2-hydroxypropyl phosphate, disodium salt		
Tridecyl phosphate	No	MOA, HCL.
All other phosphated and polyphosphated alcohols	No	TCC, (2).
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.
Octadecylamine, ethoxylated and phosphated, sodium salt	No	GDC.
All other phosphoric and polyphosphoric acid esters	No	ENJ, MOA, SCP, WTC, (2).
Sulfonic acids (and salts thereof):		
Alkylbenzenesulfonates:		
Dodecylbenzenesulfonates:		
Dodecylbenzenesulfonic acid	Yes	EMK, ENJ, JLP, LEV, PIL, STP, TEN, VST, WTC, (2).
Dodecylbenzenesulfonic acid, (mixed alkyl)amine salt	No	ECC, FTX, JLP, (2).
Dodecylbenzenesulfonic acid, ammonium salt	No	CCC, LEV, WTC, (2).
Dodecylbenzenesulfonic acid, calcium salt	Yes	HCL, ICI, RH, STP, TMH, WTC, (2).
Dodecylbenzenesulfonic acid, diethanolamine salt	No	AAC, VKR.
Dodecylbenzene sulfonic acid, DMAP salt	No	WTC.
Dodecylbenzenesulfonic acid, ethylenediamine salt	No	SCP.
Dodecylbenzenesulfonic acid, isopropanolamine salt	No	PIL.
Dodecylbenzenesulfonic acid, isopropylamine salt	Yes	AAC, ICI, KPI, SCP, STP, WTC, (2).
Dodecylbenzenesulfonic acid, monoethanolamine salt	Yes	AAC, PCI, RPC, (2).
Dodecylbenzenesulfonic acid, oleyl amine, ethoxylated, salt	No	HCL.
Dodecylbenzenesulfonic acid, potassium salt	No	BRI, GDC, LEA.
Dodecylbenzenesulfonic acid, sodium salt	Yes	AAC, APC, BLA, BOE, BRI, CP, CPC, CTL, DOW, DUP, ECC, LEA, LEV, NPR, PCI, PIL, PNX, STP, TEN, VKR, VST, WTC.
Dodecylbenzenesulfonic acid, triethanolamine salt	Yes	AAC, BRD, BRI, CCC, CPC, CTL, ESS, FTX, PCI, PIL, PPG, SCP, STP, WTC, ENJ.
All other dodecylbenzenesulfonates	No	ENJ.
Other alkylbenzenesulfonates:		
Didodecylbenzenesulfonic acid, sodium salt	No	ENJ.
Isopropyl 4-amino benzene sulfonyl d(dodecylbenzenesulfonyl) titanate	No	KPI.
Neoalkoxy, dodecylbenzene-sulfonyl titanate	No	KPI.
Tridecylbenzenesulfonic acid	No	CP, PLX.
Tridecylbenzenesulfonic acid, sodium salt	No	BLA, CMT, PG.
Benzene-, cumene-, toluene-, and xylenesulfonates:		
Benzenesulfonic acid	No	WTC.
Cumenesulfonic acid, ammonium salt	No	NES.
Cumenesulfonic acid, sodium salt	No	NES, STP, WTC.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Sulfonic acids (and salts thereof)—Continued		
Benzene-, cumene-, toluene-, and xylenesulfonates—Continued		
Toluenesulfonic acid, potassium salt	No	NES.
Toluenesulfonic acid, sodium salt	No	NES, PG, VST.
Toluene-, xylenesulfonic acid	No	WTC.
Xylenesulfonic acid, ammonium salt	No	NES, PG, STP, WTC.
Xylenesulfonic acid, sodium salt	Yes	ICI, NES, PIL, PLX, 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	PSP, RAY.
Ligninsulfonic acid, iron salt	No	MAR, PSP.
Ligninsulfonic acid, manganese salt	No	MAR.
Ligninsulfonic acid, mixed chromium and iron salts	No	PSP.
Ligninsulfonic acid, potassium salt	No	PSP.
Ligninsulfonic acid, sodium salt	Yes	ENJ, MAR, PSP, RAY, WVA.
Ligninsulfonic acid, zinc salt	No	MAR, PSP.
Naphthalenesulfonates:		
Butylnaphthalenesulfonic acid, sodium salt	No	SCP, UDI.
Di(C ₈ -C ₉ alkyl)naphthalenesulfonic acid	No	(?).
Dibutylnaphthalenesulfonic acid	No	UDI.
Diisopropylnaphthalenesulfonic acid, sodium salt	No	DUP, SCP, UDI.
Isopropylnaphthalenesulfonic acid	No	UDI.
Methylnaphthalenesulfonic acid, sodium salt	No	CPC, SCP, UDI.
Methylnonylnaphthalenesulfonic acid, sodium salt	No	UDI.
Naphthalene sulfonic acid, sodium salt, formaldehyde condensate	No	ICI, UDI.
All other naphthalenesulfonates	No	HAL, SCP.
Sulfonic acids having amide linkages:		
Sulfosuccinamic acid derivatives:		
N-(1,2-Dicarboxyethyl)-N-octadecyl sulfosuccinamic acid, tetrasodium salt	No	ACY, MOA.
N-Octadecylsulfosuccinamic acid, disodium salt	No	ACY.
Oleamidolsulfosuccinamic acid, disodium salt	No	SBC.
N-(Oleoyloxyisopropyl)sulfosuccinamic acid	No	WTC.
Taurine derivatives:		
N-(Coconut oil acyl)-N-methyltaurine, sodium salt	No	FTX, 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(dilsobutyl)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	ACY, AMU, APX, BRI, CCC, CHP, ECC, EMK, ENJ, FTX, HCL, HDG, MCP, MOA, RH, RPC, WTC.
Sulfosuccinic acid, dihexyl ester, sodium salt	No	ACY, MOA.
Sulfosuccinic acid, dilsobutyl ester, sodium salt	No	FTX.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Sulfonic acids esters (and salts thereof)—Continued		
Sulfonic acids having ester or ether linkages—Continued		
Sulfosuccinic acid esters—Continued		
Sulfosuccinic acid, dilsodecyl ester, sodium salt	No	ACY.
Sulfosuccinic acid, dilaooctyl 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)iminolopropanol half-ester, sodium salt	No	MOA.
Sulfosuccinic acid, monolaurate ester, disodium salt	No	AAC, MIR, MOA.
Sulfosuccinic acid, myristyl ester, disodium monoethanolamine salt	No	WTC.
Sulfosuccinic acid, nonoxynyl-10 ester, disodium salt	No	MOA.
Sulfosuccinic acid, oleamidopolyethyleneglycol, disodium salt	No	MOA.
Sulfosuccinic acid, ricinoleamide monoethanolamine, disodium salt	No	AAC.
All other sulfosuccinic acid esters	No	MOA, SCP, SHX, WTC.
All other sulfonic acids having ester or ether linkages:		
Coconut oil acids, 2-sulfoethyl ester, sodium salt	No	FTX, GAF, LEV. (2).
Dodecyl(diphenyloxy)disulfonic acid	No	
Dodecyl(diphenyloxy)disulfonic acid, disodium salt	No	AAC, CTL, PIL.
Dodecyl sulfoacetate, sodium salt	No	STP.
2-Hydroxy, 3-(lauryl-myristyl) (oxy-1 propane sulfonic acid), sodium salt	No	PG.
Iso-octylphenol, ethoxylated and sulfonated, sodium salt	No	GAF, RH.
n-Octylphenol, ethoxylated and sulfonated, sodium salt	No	APX.
All other sulfonic acids having ester or ether linkages	No	AC, PG, PPG, SCP.
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	DUP, SLM, WTC, (2).
Mixed linear olefin sulfonate	Yes	AAC, STP, WVA.
n-Octanesulfonic acid, sodium salt	No	(2).
Oleyloxyethylamide oxypropanol sulfonic acid	No	S.
Petroleum sulfonic acid, water soluble (acid layer), sodium salt	No	PIL.
All other sulfonic acids	No	CGY, CLU, HAL.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Sulfuric acids 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	ACT, ICI.
Oleic acid, sulfated, disodium salt	No	MCP.
Oleic acid, sulfated, sodium salt	No	ACY, CIN.
Propyl oleate, sulfated, sodium salt	No	MRV.
All other esters of sulfated oleic acid	No	SCP.
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.
All other sulfated esters	No	(?).
Alcohols, sulfated:		
Decyl and octyl sulfate, sodium salt	No	WTC.
Decyl sulfate, sodium salt	Yes	AAC, ARI, SCP, WTC.
Dodecylsulfate salts:		
Dodecyl sulfate, ammonium salt	Yes	AAC, BRD, LEV, STP, TNI, WTC, (?).
Dodecyl sulfate, diethanolamine salt	No	BRD, DUP, JRG, STP.
Dodecyl sulfate, N,N-diethylcyclohexylamine salt	No	DUP, S.
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, SHX, STP, TNI.
3,9-Diethyl-6-tridecyl sulfate, sodium salt	No	NCC.
2-Ethylhexyl sulfate, sodium salt	Yes	AAC, BRD, NCC, SCP, WTC.
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	No	NCC.
Hexadecyl sulfate, sodium salt	No	AAC, MIL.
Hexyl sulfate, potassium salt	No	DEX.
Mixed linear alcohols, sulfated, ammonium salt	No	CP, SCP, WTC, (?).
Mixed linear alcohols sulfated, mixed sodium/cocodithanolamine salts		
Mixed linear alcohols, sulfated, sodium salt	No	AAC.
Mixed linear alcohols, sulfated, triethanolamine salt	No	DUP, PG, SCP, WTC.
Mixed linear alcohols, sulfated, triethanolamine salt	No	SCP, WTC.
Octyl sulfate, sodium salt	No	AAC, DUP.
Oleyl sulfate, sodium salt	No	AAC, DUP.
Oxoalcohol bottoms, sulfated, sodium salt	No	WVA.
Tridecyl sulfate, sodium salt	No	AAC.
All other linear alcohols, sulfated	No	PG, PLX, SCP.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
Sulfuric acids esters (and salts thereof)—Continued		
Ethers, sulfated:		
Alkylphenols, ethoxylated and sulfated:		
(Mixed alkyl)phenol, ethoxylated and sulfated, sodium salt	No	(²), SCP.
1-Naphthol, ethoxylated and sulfated, free acid	No	
Nonylphenol, ethoxylated and sulfated, ammonium salt	No	AAC, GAF, RPC, STP.
Nonylphenol, ethoxylated and sulfated, sodium salt	No	GAF, WTC.
Octylphenol, ethoxylated and sulfated, sodium salt	No	AAC, RH.
Octylphenoxy polyethoxy ethyl sulfate	No	AAC.
All other sulfated cyclic ethers	No	
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt		
	Yes	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		
	Yes	BRD, PG, SCP, SHC, STP, VST, WTC, (²), (²).
Mixed linear alcohols, ethoxylated and sulfated, sodium salt		
	Yes	AAC, BRD, DUP, PG, PIL, SCP, SHC, STP, VST, WTC, WVA.
Tridecyl alcohol, ethoxylated and sulfated, sodium salt		
	No	AAC, BRD.
All other sulfated ethers		
	No	SCP.
Natural fats and oils, sulfated:		
Castor oil, sulfated, sodium salt	Yes	ACT, ACY, ARI, ARL, CRT, DEX, HIP, ICI, LEA, LUR, MRV, S, SCP, WHW.
Coconut oil, sulfated, sodium salt	No	ACY.
Cod oil, sulfated, ammonium salt	No	ARI.
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	Yes	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	Yes	CRT, LUR, SLM, WHW.
Mixed vegetable oils, sulfated, ammonium salt	No	LUR.
Mixed vegetable oils, sulfated, sodium salt	No	CPC, CRT.
Mustard seed oil, sulfated, sodium salt	No	CRT.
Neatsfoot oil, sulfated, sodium salt	No	ARI, WHW.
Peanut oil, sulfated, sodium salt	No	ACY.
Soybean oil, sulfated, sodium salt	No	ACT, SCP.
Synthetic fatty alcohol ester, sulfated, sodium salt		
	No	SLM.
Tall oil, sulfated, ammonia salt	No	CIN.
Tall oil, sulfated, sodium salt	Yes	ACT, ARI, CIN, CRT, WHW, WTC.
Tallow, sulfated, sodium salt	Yes	ARI, CCC, CRT, LUR, NSC, SCP, WHW.
All other natural fats and oils, sulfated	Yes	LUR, SCP, TEN.
All other sulfuric acid esters	No	SCP.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Anionic—Continued		
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 alkanolamide/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.
Stearoyl iso-lactylate, sodium salt	No	BFP.
Stearoyl lactylate, mixed sodium and calcium salt	No	BFP.
Stearoyl lactylate, sodium salt	No	BFP.
Stearoyl lactylate, sodium salt	No	BFP.
Tridecyl alcohol, ethoxylated and carbonated, sodium salt	No	S.
All other anionic surface-active agents	No	DUP, MOA, SDC, WVA.
Cationic		
Amine oxides and oxygen-containing amines (except those having amide linkages):		
Acyclic:		
3-(C ₁₂ -C ₁₈ alkyloxy)-1-propanamine	No	ENJ.
3-(C ₁₂ -C ₁₈ alkyloxy)-1-propanamine	No	ENJ.
N-(C ₁₂ -C ₁₈ alkyl)oxypropyl trimethylene diamine	No	ENJ.
N,N-Bis(2-hydroxyethyl)(coconut oil alkyl)amine	No	ARC.
N,N-Bis(2-hydroxyethyl)(coconut oil alkyl)amine oxide	No	SHX.
Bis-(2-hydroxyethyl)isodecylxypropylamine oxide	No	ENJ.
N,N-Bis(2-hydroxyethyl)octadecylamine	No	ARC, SHX.
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	No	ARC, ENJ, HCL, JTO, SHX.
Cocoamidopropyl dimethyl amine	No	(?).
(Coconut oil alkyl)amine, ethoxylated	Yes	ARC, BAS, ENJ, ETC, ICI, PPG, SCP, SHX, SVC, WTC, (?), (?).
(Coconut oil alkyl)amine, ethoxylated, acetate	No	BRD.
(Coconut oil alkyl)amine, ethoxylated and phosphated	No	(?).
(Coconut oil alkyl)amine, propoxylated	No	SHX.
Diallylenetriamine, alkoxylated	No	(?).
N,N-Dimethyl(coconut oil alkyl)amine oxide	No	ARC.
N,N-Dimethyldodecylamine oxide	No	(?).
N,N-Dimethyldodecylamine oxide	No	AAC, CTL, PG, PPG, SHX.
N,N-Dimethylhexadecylamine oxide	No	ARC, BRD, PPG.
N,N-Dimethyl(mixed alkyl)amine oxide	No	PG, S.
Ethylenediamine, alkoxylated	No	(?).
Ethylene diamine ethoxylated	No	KPI.
Hexyloxypropyl amine	No	DUP, ENJ.
(Hydrogenated tallow alkyl)amine, ethoxylated	Yes	ENJ, ETC, SHX, WTC.
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl)-ethylenediamine	No	(?).
2-Imidazoline-1-(2-aminoethyl)-2-(tall oil alkyl), ethoxylated	No	(?).
Isodecylxypropylamine	No	ENJ.
Isodecylxypropylamine, ethoxylated	No	ENJ.
3-(3-Isodecylxy)propylaminopropyl amine	No	SHX.
N-Isodecylxypropyl trimethylene diamine	No	ENJ.
Isodicyclopropyl amine propoxylated acetate	No	SHX.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Cationic—Continued		
Amine oxides and oxygen-containing amines (except those having amide linkages)—Continued		
Acyclic—Continued		
Isononyloxypropylamine	No	ENJ.
Isopropoxy-tris(2-ethylenediamino)ethyl titanate	No	KPI.
Isotridecyloxypropylamine	No	ENJ.
N-Isotridecyloxypropyl trimethylene diamine	No	ENJ.
3-(3-Mixed alkoxy)propylaminopropyl amine	No	SHX.
(Mixed alkyl)amine, ethoxylated	No	ICI, RH, SHX.
Neoalkoxy, tri(m-amino)-phenyl titanate	No	KPI.
Neoalkoxy, tris(m-amino) phenyl zirconate	No	KPI.
(9-Octadecenyl)amine, ethoxylated	Yes	ETC, GAF, HCL, SCP, WTC, (2).
Octadecylamine, ethoxylated	Yes	ARC, ETC, SCP, WTC.
Octyldimethylamine oxide	No	HNT.
Polyether amine, ethoxylated	Yes	RH.
(Soybean oil alkyl)amine, ethoxylated	No	ARC, ENJ, ETC, JTO, SHX, SVC.
(Tallow alkyl)amine, ethoxylated	Yes	AAC, ARC, BAS, DUP, ENJ, ETC, GAF, JTO, S, SCP, SHX, WTC, (2), (2).
(Tallow alkyl)amine, propoxylated	No	SHX.
N-(Tallow alkyl)trimethylenediamine, ethoxylated	Yes	ARC, ENJ, ETC, GAF, JTO, (2).
(Tallow ethyl alkyl)amine, ethoxylated, sulfate	No	ETC, RPC.
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	No	BAS, HCL.
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine, propoxylated	No	HCL.
N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylene diamine	No	BAS.
N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylene diamine, propoxylated and ethoxylated	No	BAS.
3-(3-Tridecyloxy)propylaminopropyl amine	No	SHX.
Triethanolamine, ethoxylated	No	MIL, SCP.
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, JTO, LUR, MOA, PG, SCP, WTC, (2).
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-(8-Heptadecenyl)-4,4-bis(hydroxymethyl)-2-oxazoline	No	ENJ, GAF.
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, 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, GAF, HDG, MIR, MOA, (2).
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazoline, fatty acid salt	No	(2).
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	SCP, (2).

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Cationic—Continued		
Amines and amine oxides having amide linkages—Continued		
Carboxylic acid-diamine and polyamine condensates:		
Acetic acid, amides with polyalkylene polyamines, salt	No	(?)
Caprylic acid tetraethylene-pentamine condensate	No	ICI.
Coconut oil acids-N,N-dimethyltrimethylenediamine condensate	No	ENJ.
Mixed fatty acids-polyalkylenepolyamine condensate	No	SCP.
Naphthenic acids-polyalkylene polyamine condensate	No	(?)
Naphthenic acids-tall oil fatty acids-polyalkylene polyamine condensate	No	(?)
2-Nor-tall oil alkyl-1-tall oil amido-ethyl imidazoline	No	SHX.
Oleic acid-N,N-dimethyltrimethylenediamine condensate	No	CCW.
Pelargonic acid-tetraethylenepentamine condensate	No	ETC, HCL, ICI, OC.
Stearic acid-diethylenetriamine condensate	No	ARC, ARI, OC, S, SCP, SQA.
Stearic acid-diethylenetriamine condensate, ethyl sulfate	No	GDC.
Stearic acid, N,N-dimethylamino-propylamine condensate	No	MOA.
Stearic acid-ethylenediamine condensate	No	CLD, SOS, (?)
Stearic acid mixed amine condensate	No	HCL.
Stearic acid-tetraethylenepentamine condensate	No	(?)
Tall oil acids-aminoethylpiperazine condensate	No	ENJ.
Tall oil acids-diethylenetriamine condensate	No	WTC, WVA.
Tall oil acids-polyalkylenepolyamine condensate	No	FER, WVA, (?)
Tall oil acids-polyalkylene polyamine condensate, salts, with dodecylbenzene sulfonic acid and/or tall oil fatty acids	No	(?)
Tallow fatty acids-aminoethylethanolamine condensates	No	OC.
All other carboxylic acid-diamine and polyamine condensates	No	ARI, SCP, WVA.
Carboxylic acid-diamine and polyamine condensates, alkoxylated:		
Mixed fatty acids-alkylenediamine condensate, polyethoxylate	No	SHX, WTC.
Palm oil acids-ethylenediamine condensate, monoethoxylated	No	FTX.
Stearic acid-ethylenediamine condensate, monoethoxylated	No	APC, DEX, GDC, ICI, VKR.
All other carboxylic acid-diamine and polyamine condensates, alkoxylated	No	SCP, VKR.
Other amines and amine oxides having amide linkages:		
Cocoamidopropyl dimethyl amine oxide	No	AAC, PAT, SBC, SHX.
N,N'-(DI-tall oil acid)amidoethylamine	No	(?)
1-(2-Hydrogenated tallow amidoethyl)-2-nor(hydrogenated tallow)-2-Imidazoline	No	SHX.
3-Lauramido-N,N-dimethylpropylamine oxide	No	FTX, SQA.
Oleamidopropylidimethylamine	No	WM.
Stearamidodihyldimethylamine	No	S.
Stearamidoethylethanolamine acetate	No	S.
Stearic acid, diethanolamine condensate, methyl sulfate	No	DUP.
Stearylamidopropylidimethylamine	No	AAC, WM.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Cationic—Continued		
Amines, not containing oxygen (and salts thereof):		
Amine salts:		
(Coconut oil alkyl) amine acetate	No	ENJ.
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.
N-(Tallow alkyl) trimethylenediamine acetate	No	ARC.
All other amine salts (not containing oxygen)	No	CRT, SHX.
Diamines and polyamines:		
Imidazoline derivatives:		
1-(2-Aminoethyl)-2-naphthyl-2-imidazoline	No	(²).
1-(2-Aminoethyl)-2-nor(tallow alkyl)-2-imidazoline	No	WTC, (²).
N-(Coconut oil alkyl) trimethylenediamine	No	ARC, JTO, SHX.
N-(Dimeraclidalkyl) trimethylenediamine	No	ENO.
N-Dodecyl-diethylenetriamine	No	SCO.
2-Heptadecyl-2-imidazoline	No	CGY.
N-(Mixed alkyl) polyethylenepolyamine	No	CCW.
N-(9-Octadecenyl) trimethylenediamine	No	ARC, JTO, SHX.
Polyalicyclic polyamines and salts and quats	No	(¹).
Polyamine/tallow oil imidazoline	No	WTC.
1-Propanamine, 3-(C ₁₂ -C ₁₆ alkoxy derivatives)	No	SHX.
N-(Soybean oil alkyl) trimethylenediamine	No	ENO, WTC.
Stearamidodecyl-2-heptadecyl imidazoline	No	ICI.
3-(Tallow oil amino) propyl amine	No	SHX.
N-(Tallow alkyl) dipropylenetriamine	No	ARC, ENJ, SHX.
N-(Tallow alkyl) trimethylenediamine	No	ARC, ENJ, JTO.
All other diamines and polyamines	No	ARC, JTO, SHX, WTC, (²).
Primary monoamines:		
Alkyl dimethyl amine oxide	No	HCL.
Arachidylbehenylalkyl amine	No	ENO.
(Coconut oil alkyl) amine	Yes	ARC, ENO, JTO, SHX, WTC.
Dimeraclidalkyl amine	No	ENO, WTC.
Dodecylamine	No	ARC, JTO, SHX.
[Erucyl alkyl] amine	No	ENO.
Hexadecylamine	No	ARC, ENO.
(Hydrogenated tallow alkyl) amine	Yes	ARC, ENO, JTO, SHX, WTC.
(Mixed alkyl) amine	No	JTO, SHX.
9-Octadecenylamine	Yes	ARC, ENO, JTO, SHX, WTC.
Octadecylamine	Yes	ENO, JTO, SHX, WTC.
(Soybean oil alkyl) amine	Yes	ARC, ENO, JTO, WTC.
(Tallow alkyl) amine	Yes	ARC, ENJ, ENO, JTO, SHX, WTC.
All other primary monoamines	No	ARC.
Secondary and tertiary monoamines:		
Bis(coconut oil alkyl) amine	No	ARC.
Bis(hydrogenated tallow alkyl) amine	No	ARC, ENO, WTC.
Bis(tallow alkyl) amine	No	ARC.
1-Decanamine, N,N-didodecyl	No	SHX.
N,N-Dimethylbemyrlarachidylamine	No	WTC.
N,N-Dimethyl(coconut oil alkyl) amine	No	ARC, JTO, PG.
N,N-Dimethyldodecylamine	No	ARC, SHX, TNA, WTC.
N,N-Dimethylerucylamine	No	ENO.
N,N-Dimethylhexadecylamine	No	ARC, SHX.
N,N-Dimethyl(hydrogenated tallow alkyl) amine	No	ARC, CPC.
N,N-Dimethyl(mixed alkyl) amine	No	BRD.
N,N-Dimethyl(9-octadecenyl-alkyl) amine	No	ENO.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Cationic—Continued		
Amines, not containing oxygen (and salts thereof)—Cont.		
Secondary and tertiary monoamines—Continued		
N,N-Dimethyloctadecylamine	Yes	ARC, ENO, SHX, WTC.
N,N-Dimethyl(soybean oil alkyl)amine	No	ARC, ENO, JTO, WTC.
N,N-Dimethyltetradecylamine	No	BRD, SHX.
N-Methylbis(coconut oil alkyl)amine	No	ARC, JTO.
N-Methylbis(hydrogenated tallow alkyl)amine	No	ARC, ENO, SHX, WTC.
Methyl didecylamine	Yes	ARC, SHX, TNA.
N-Methyldioctadecylamine	No	ARC, SCP, SHX.
Tridodecylamine	No	ARC.
Tri(hydrogenated tallow) amine	No	SHX.
Trisodocylamine	No	SCP.
Trilaurylamine	No	SCP.
Tri(mixed alkyl)amine	No	SHX, TNA.
Trioctylamine	No	SHX.
Tri(tridecyl)amine	No	SHX.
All other secondary and tertiary monoamines	No	ARC, JTO.
Oxygen-containing quaternary ammonium salts:		
β-Alanine-N-(2-hydroxyethyl)-N-2,1-[(oxococoyl) amino] ethyl, sodium salt	No	SHX.
2-(C ₁₃ -C ₁₇ Alkyl)-1-(C ₁₄ -C ₁₈ amidoethyl)(4,5-dihydro-3-methyl)imidazolium, methyl sulfate	No	DOW, SVC.
(2-Aminoethyl)ethyl(hydrogenated tallow alkyl)(2-hydroxyethyl)ammonium ethyl sulfate	No	OC.
Benzyl(coconut oil alkyl)bis(2-hydroxyethyl)-ammonium chloride	No	ARC, (*).
1-Benzyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolium chloride	No	HDG.
1-Benzyl-1-(2-hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazolium	No	(*).
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)methyl(9-octadecenyl)-ammonium chloride	No	SHX.
Bis(2-hydroxyethyl, ethoxylated)-methyloctadecyl ammonium chloride	No	SHX.
Bis-2-hydroxyethyl-hydrogenated tallow-ethyl sulfate	No	ICI.
Bis[2-hydroxyethyl]methyl(tallow alkyl)ammonium chloride	No	ARC, JTO.
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate (Coconut oil alkyl)bis(2-hydroxyethyl, ethoxylated)-methylammonium chloride	Yes	HXL.
(Coconut oil alkyl)-bis-(hydroxyethyl)methyl ethoxylated mono-(2-carboxyethyl)ether methyl sulfate, potassium salt	No	ENJ, GAF, JTO, SHX.
Distearyl dimethyl ammonium methosulfate	No	SVC.
Ethoxylated(hydrogenated tallow amine), methyl ammonium chloride	No	HXL.
Ethoxylated, quaternized (C ₁₂ -C ₁₈ alkyl) oxypropyl trimethylene diamine	No	ENJ.
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	No	ENJ.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Cationic—Continued		
Oxygen-containing quaternary ammonium salts—Continued		
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.
Ethyl(polyoxyethylene, cocoamine) ethylsulfate	No	S.
N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	No	ICI, PCH.
α -Glucosamidopropyl 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-imidazolone	No	MOA.
N-2-Hydroxy propyl-n-methyl-N,n-bis[tallow 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) hydrogenated tallow alkylammonium chloride	No	ENJ.
Methyl, bis-(2-hydroxyethyl)isodecylloxypropyl ammonium chloride	No	ENJ.
Methyl, bis-(2-hydroxyethyl)isotridecylloxypropyl ammonium chloride	No	ENJ.
Methyl, bis-(2-hydroxyethyl)soya-alkylammonium chloride	No	ENJ.
Methyl(dioleyloxy) ammonium methyl sulfate	No	SHX.
Methyl-di(tallow)imidazolium methosulfate	No	SVC.
1-Methyl-2-(8-heptadecenyl)-1-(9-octadecenyl) amidoethyl	No	SHX.
Methyl(hydrogenated tallow alkyl)diethylamine condensate, polyethoxylated, methyl sulfate	No	SVC.
N-Methyl-N-polyoxyethylene-N,N-bis(hydrogenated tallow amidoethyl)ammonium	No	SHX.
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	No	SHX.
Methyl(tallow)diethylenetriamine condensate, polyethoxylated, methyl sulfate	No	SVC.
Methyl(tallow)diethylenetriamine condensate, polypropoxylated, methyl sulfate	No	SVC.
Mixed alkyl imidazolone derivative, ethoxylated	No	MOA.
Mixed(coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	No	ENJ.
Mixed fatty acid amide with diethylenetriamine, ethyl sulfate	No	EFH.
N-Octadecyl-N,N-di(2-hydroxyethyl)-N-methylammonium chloride	No	SHX.
Polyethyleneimine methyl ammonium sulfate	No	HCL.
Poly(oxyethanyl-1,2-diy)- α -[2-bis(2-aminoethyl)-methylammoniumethyl]- ω -hydroxy-N,N'-di(C14-C18 alkyl methyl sulfate	No	SVC.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Cationic—Continued		
Oxygen-containing quaternary ammonium salts—Continued		
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 dimethyl ceteryl ammonium tosylate and propylene glycol	No	VND.
Stearylamidopropyl dimethyl myristyl acetate ammonium chloride	No	VND.
(Tallow alkyl)amine, ethoxylated, diethosulfate	No	ETC.
Tallow amine, ethoxylated, quaternary ammonium salt	No	DUP, VND.
All other oxygen-containing quaternary ammonium salts	No	ARC, BRD, SBC, SCP, SHX, (2) (2).
Quaternary ammonium salts, not containing oxygen:		
Acyclic:		
Bis (coconut oil alkyl) dimethyl ammonium chloride	Yes	ARC, ENJ, JTO, PPG, SHX.
Bis (hydrogenated tallow alkyl) dimethyl ammonium chloride	Yes	ARC, ENO, SHX, WTC.
Bis (hydrogenated tallow alkyl)-dimethyl ammonium methyl sulfate	No	ARC, SHX.
Bis (tallow alkyl) dimethyl ammonium chloride	No	ARC, SHX.
N-(Cocoamidopropyl; N,N-acetic acid) ammonium salt	No	(2).
Cocodimethyl ethyl ammonium ethyl sulfate	No	SHX.
N-(Coconut oil alkyl) aminobutyric acid, sodium salt	Yes	ARC, BRD, JTO, PPG, SHX.
Didecyl dimethyl ammonium chloride	No	HNT.
Dimethyl di(C ₁₂ -C ₁₈) ammonium chloride (mixed straight and branched chains)	No	SHX.
Dimethyldioctadecyl ammonium chloride	No	SHX.
N,N-Dioctyl-N,N-dimethyl ammonium chloride	No	BRD, HNT.
Di (tallow) amido ammonium sulfate	No	CRD.
Dodecyl trimethyl ammonium bromide	No	RSA.
Dodecyl trimethyl ammonium chloride	No	ARC, SHX.
Ethyl dimethyl (mixed alkyl) ammonium ethyl sulfate	No	DEX.
Hexadecyl trimethyl ammonium bromide	No	ARC.
Hexadecyl trimethyl ammonium chloride	No	AAC, ARC, BRD, SHX.
Hexane-1,6-bis (tributyl ammonium bromide)	No	HXL.
(Hydrogenated tallow alkyl) trimethyl ammonium chloride	No	SHX.
Hydroxypropyl ammonium cyano acetate	No	(2).
Lauryl pyridinium chloride	No	WTC.
Methyl (tri-hydrogenated tallow alkyl) ammonium chloride	No	WTC.
Methyl-1-(tallow) amidoethyl-2-(tallow) imidazolium-methyl sulfate	No	CRD.
Methyl tri (C ₈ -C ₁₀) ammonium chloride	No	SHX.
Methyl trioctyl ammonium chloride	No	SCP.
(Mixed alkyl) ammonium chloride	No	MIL.
(Mixed linear alkyl) dimethyl ammonium methyl sulfate	No	HCL.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Cationic—Continued		
Quaternary ammonium salts, not containing oxygen—Continued		
Acyclic—Continued		
Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl) ammonium chloride	No	BRD.
Octyldecyldimethylammonium chloride	No	HNT.
N-Octyl, N-decyl, N,N-dimethyl ammonium chloride	No	BRD.
N,N,N',N',N'-Pentamethyl-N-(tallow alkyl)-trimethylene-bis(ammonium chloride)	No	ARC, SHX.
Stearic acid ethylene diamine methyl ammonium sulfate	No	HCL.
Stearylpyridium chloride	No	WTC.
Tetraethylammonium bromide	No	EK.
Tributylmethylammonium chloride	No	TNA.
Trihydrogenated (tallow) ammonium chloride	No	ENO.
Trimethyloctadecylammonium chloride	No	SHX.
Trimethyl (soybean oil alkyl) ammonium chloride	No	ARC, JTO, SHX.
Trimethyl (tallow alkyl) ammonium chloride	No	ARC, ENO, SHX, WTC.
All other quaternary ammonium salts, not containing oxygen, acyclic	No	ARC, MOA, (2), (2).
Cyclic:		
Benzyl (alkylpyridinium) chloride	No	(2).
Benzyl (cocamidopropyl) dimethyl ammonium chloride	No	(2).
Benzyl (coconut oil alkyl) dimethyl ammonium chloride	Yes	ENJ, ENO, GDC, HRT, LUR, WTC, (2).
Benzyl-di (hydrogenated tallow alkyl) methyl-ammonium chloride	No	WTC.
Benzyl dimethyl (mixed alkyl) ammonium chloride	Yes	BKM, BRD, CRD, HNT, PCI, SHX, TCC, (2), (2).
Benzyl dimethyloctadecyl ammonium chloride	Yes	AAC, PPG, SHX, TNI.
Benzyl dimethyloleyl ammonium chloride	No	AAC.
Benzyl dimethyl (tallow alkyl) ammonium chloride	No	BOE, ENO, WTC.
Benzyl hexadecyl dimethyl ammonium chloride	No	BKM, PPG.
Benzyl (hydrogenated tallow alkyl) dimethyl ammonium chloride	No	ARC, ENO, WTC.
Benzyl-methyl-bis (hydrogenated tallow) ammonium chloride	No	ENO.
Benzyl (mixed alkyl) pyridinium chloride	No	(2).
Benzyl picolinium chloride	No	GDC, LUR.
1-Benzylpyridinium chloride	No	BRD.
1-Benzylquinolinium chloride	No	(2).
Benzyl trimethyl ammonium chloride	Yes	HIP, PCI, RSA, SHX, TCC, UTC.
Butylpicolinium bromide	No	HXL.
2,4-Dichlorobenzyl dimethyl (mixed alkyl) ammonium chloride	No	(2).
1-Dodecylpyridinium chloride	No	CCL.
(Ethylbenzyl) dimethyl (mixed alkyl) ammonium chloride	No	DAN, HNT.
Octadecyl-dibenzyl trimethyl-1,3-propane diammonium chloride	No	GDC.
1-Phenethyl-2-picolinium bromide	No	HXL.
All other cyclic quaternary ammonium salts not containing oxygen	No	(2), (2).
All other cationic surface-active agents	No	BRI, CGY, CRT, DUP, JTO, LUR, MIR, MOA, RPC, S, SCP, SDC, WM, WTC, WVA.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic		
Carboxylic acid amides:		
Diethanolamine condensates, amine/acid ratio = 2/1:		
Capric acid	No	SCP.
Castor oil acids	No	AAC, NSC.
Coconut oil acids	Yes	AAC, ARD, ARL, BRI, CCC, CON, CRT, CTL, ECC, EFH, GDC, HNT, HRT, LEA, LUR, MCP, MOA, MRV, PNK, PPG, RPC, SBC, SCP, SHX, STP, WTC.
Coconut oil and tallow acids	Yes	BRD, ENJ, ESS, MOA, SBC, UNN.
Lauric acid	No	CRD, MOA, PPG.
Lauric and myristic acids	Yes	CRD, FTX, SBC, STP.
Linoleic acid	No	MOA.
Mixed carboxylic acids	No	FER, RPC, SOS.
Mixed fatty acids, neutralized	No	FTX.
Mixed vegetable oil acids	No	SHX.
Oleic acid	Yes	AAC, CRT, CTL, EFH, LEA, MOA, PPG, SBC, STP, WTC.
Palmitic and stearic acids	No	RPC.
Soybean oil acids	No	AAC.
Stearic acid	Yes	AAC, AIP, OC.
Tall oil acids	Yes	BRI, ECC, HCL, MOA, PNK, PPG, SBC, WVA.
Tallow acids	No	ICI.
All other diethanolamine condensates, amine/acid ratio = 2/1	No	AAC, LUR, MOA.
Diethanolamine condensates, other amine/acid ratios:		
Capric acid (ratio = 1/1)	No	MOA.
Coconut oil acids (ratio = 1/1)	Yes	AAC, ARD, BRD, CCL, CPC, CTL, EMK, ETC, FTX, GAF, HNT, HTN, JRG, LUR, MIR, MOA, PIL, PPG, QCP, SBC, SCP, SHX, STP, TMH, VND, WTC, (?).
Lard oil acids (ratio = 1/1)	No	QCP.
Lauric acid (ratio = 1/1)	Yes	AAC, HTN, MOA, SBC, TNI, WTC.
Lauric and myristic acids (ratio = 1/1)	Yes	AAC, BRD, FTX, MOA, SBC.
Linoleic acid (ratio = 1/1)	Yes	MOA, PPG, SBC, VND.
Mixed carboxylic acids	No	SOS, WTC.
Mixed fatty acids (amine/acid ratio = 1/1)	No	AAC, QCP, WTC.
Myristic acid (ratio = 1/1)	No	MOA.
Oleic acid (ratio = 1/1)	No	SBC.
Palm kernel oil acids (ratio = 1/1)	No	SVC, TMH.
Rapeseed acids (ratio = 1/1)	No	EFH.
Soybean oil acids (ratio = 1/1)	No	AAC, MOA, SBC.
Stearic acid (ratio = 1/1)	Yes	AAC, BRD, CHP, ECC, ENJ, HIP, LEA, MRV.
Tall oil acids	No	QCP, WTC, (?).
Tallow acids	No	MOA.
All other diethanolamine condensates, other amine/acid ratios	No	EFH, MOA, SCP.
All other carboxylic acid amides:		
Coconut oil acids (ratio = 1/1)	No	AAC, FTX, MOA, PG, PPG, SOS.
Coconut oil acids (ratio = 2/1)	No	ENJ, MOA, STP.
Coconut oil acids	No	HTN, MOA, PAT, STP.
Coconut oil acids—dimethylaminopropylamine condensate (amine/acid ratio = 1/1)	No	(?).
Coconut oil acids—ethanolamine condensate, ethoxylated	No	BRD, STP.
Dioleic acid (ratio = 1/2)	No	(?).
Hydrogenated tallow acids, aminoethyl ethanolamide, acetate salt	No	PCI.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic—Continued		
Carboxylic acid amides—Continued		
All other carboxylic acid amides—Continued		
Hydrogenated tallow glycerides diethylenediamine condensate	No	LEA.
Hydrogenated tallow glycerides diethylenetriamine condensate	No	HRT.
Isonanoic acid, mono- and triethanolamine salt	No	HCL.
Isostearic acid, aminoethylethanolamide, acetate salt	No	PCI.
Lauric acid	No	HTN, MOA.
Lauric acid (ratio = 1/1)	No	AAC.
Lauric and myristic acids	No	AAC.
Lauric and myristic acids (ratio = 1/1)	No	MOA.
Mink amidopropyl dimethyl amine (amine acid ratio = 1/1)	No	VND.
Mixed fatty acids, diethanolamine condensate	No	WTC.
Oleic acid-ethanolamine condensate, ethoxylated	No	SHX.
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-N-aminoethyl ethanolamine condensate	No	BOE.
Stearic acid-ethylenediamine condensate (ratio = 1/2)	No	SCP, SLC.
Stearic acid monoethanolamine condensate	No	WTC.
Tall oil acids-dimethylamine condensate (ratio = 1/1)	No	BKM.
Tall oil fatty acids (ratio = 1/2)	No	EFH.
Tall oil fatty acids (ratio = 2.7/1)	No	EFH.
Tall oil fatty acids (ratio = 1.5/1)	No	EFH.
Tall oil fatty acids-triethanolamine condensate	No	(?).
Tallow acids (ratio = 1.00/1.65)	No	PAT.
Tallow, N-[3-(dimethylamino)propyl] (ratio = 1/3)	No	PAT.
All other carboxylic acid amides	No	CGY, CRT, JTO, LUR, MOA, SBC, ROB, SCP. (2).
Carboxylic acid esters:		
Anhydrosorbitol esters:		
Anhydrosorbitol dioleate	No	ICI.
Anhydrosorbitol monoester of tall oil acids	No	HDG.
Anhydrosorbitol monolaurate	Yes	BRD, ICI, PPG, SCP.
Anhydrosorbitol mono-oleate	Yes	BRD, HDG, ICI, PPG, SCP.
Anhydrosorbitol monopalmitate	No	ICI, PPG.
Anhydrosorbitol monostearate	Yes	BRD, HDG, ICI, PPG.
Anhydrosorbitol sesquileate	Yes	BRD, HDG, SCP.
Anhydrosorbitol triester of tall oil acids	No	(?).
Anhydrosorbitol trioleate	Yes	BRD, HDG, ICI, PPG, SCP.
Anhydrosorbitol tristearate	No	BRD, PPG.
All other anhydrosorbitol esters	No	BRD.
Diethylene glycol esters:		
Diethylene glycol distearate	No	BRD.
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 sesquilester of tall oil acids	No	ECC, WVA.
Diethylene glycol sesquilaurate	No	BRD.
Diethylene glycol terephthalate	No	UPF.
All other diethylene glycol esters	No	VND.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Ethoxylated anhydrosorbitol esters:		
Ethoxylated anhydrosorbitol monolaurate	Yes	BRD, ETC, HDG, ICI, PPG, SCP, SVC.
Ethoxylated anhydrosorbitol mono-oleate	Yes	BRD, ETC, HDG, ICI, PPG, SCP, SVC.
Ethoxylated anhydrosorbitol monopalmitate	No	HDG, ICI, PPG.
Ethoxylated anhydrosorbitol monostearate	Yes	BRD, ETC, HDG, ICI, PPG, SCP.
Ethoxylated anhydrosorbitol triester of tall oil acids	No	ICI, WTC.
Ethoxylated anhydrosorbitol trioleate	Yes	BRD, ETC, HDG, ICI, PPG, SCP.
Ethoxylated anhydrosorbitol tristearate	Yes	BRD, HDG, 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	SCP.
Ethoxylated sorbitol hexaoleate	No	ICI, PPG.
Ethoxylated sorbitol lanolin ester	No	ICI.
Ethoxylated sorbitol mono-oleate	No	CPC, ICI.
Ethoxylated sorbitol monostearate	No	CPC, SCP.
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	(?).
Ethoxylated sorbitol tetraoleate	No	ICI.
Ethoxylated sorbitol tetrastearate	No	ICI.
Ethylene glycol esters:		
Ethylene glycol distearate	No	AAC, ENJ, HDG, PPG, SCP, STP, WM, WTC.
Ethylene glycol monostearate	No	AAC, BRD, HDG, PPG, SCP, STP, VND, WM, WTC.
Ethylene glycol sesquitearate	No	JTO, STP.
All other ethylene glycol esters	No	SCP.
Glycerol esters:		
Complex glycerol esters:		
Glycerol diacetyltritartrate 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.
All other complex glycerol esters	No	BRD, SCP.
Glycerol esters of chemically defined acids:		
Glycerol dilaurate	No	LEV, STP, VND.
Glycerol monolaurate	No	BRD, HDG.
Glycerol mono-oleate	Yes	BRD, EFH, HAL, HDG, PPG, SCP, STP, SVC, WTC.
Glycerol monoricinoleate	No	BRD, HDG.
Glycerol monostearate	Yes	BRD, CCC, CHL, CPC, HAL, HDG, HRT, LUR, PPG, SCP, SOS, SQA, STP, VND, WM, WTC.
Glycerol trioctanoate/decanoate	No	WM.
All other glycerol esters of chemically defined acids	No	SCP.
Glycerol esters of mixed acids:		
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.
Glycerol monoester of cottonseed oil acids	No	EKT.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Glycerol esters—Continued		
Glycerol esters of mixed acids—Continued		
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, PPG.
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, PPG.
Glycerol monoester of tallow acids	No	EKT.
Glycerol sesquilester of hydrogenated tallow acids	No	PCI.
Glycerol triester of mixed fatty acids	No	SVC.
All other glycerol esters of mixed acids	No	BFP.
Natural fats and oils, ethoxylated:		
Castor oil, ethoxylated	Yes	AAC, CPC, ETC, GAF, HCL, HTN, ICI, MIL, PPG, S, SCP, SVC, TMH, WTC. (2).
Coconut oil, ethoxylated	No	ETC, HCL.
Hydrogenated castor oil, ethoxylated	Yes	ETC, HCL, ICI, MIL, PPG, SCP.
Lanolin, ethoxylated	Yes	AAC, CRD, HCL, SCP, (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	Yes	AAC, GAF, HCL.
Tall oil acids, ethoxylated and propoxylated	No	(2).
Tall oil, refined, ethoxylated	No	SCP, (2).
Tallow fatty acids, ethoxylated	No	GAF.
All other natural fats and oils, ethoxylated	No	BAS, HCL, HDG, MIL, VND.
Polyethylene glycol esters:		
Polyethylene glycol esters of chemically defined acids:		
Polyethylene glycol dilaurate	Yes	BRD, EFH, ETC, HDG, PPG, SCP, STP, WM.
Polyethylene glycol dioleate	Yes	BRD, EFH, ETC, HAL, HDG, MIL, OC, PPG, QCP, SCP, SOS, STP, (2).
Polyethylene glycol distearate	Yes	AAC, BRD, HDG, PPG, STP, WTC.
Polyethylene glycol monocaprylate	No	ECC.
Polyethylene glycol monolostearate	No	PPG.
Polyethylene glycol monolaurate	Yes	BRD, CCA, CGY, ECC, EFH, ENJ, ETC, HAL, HDG, ICI, PPG, SCP, STP, SVC.
Polyethylene glycol mono-oleate	Yes	BOE, BRD, CCA, CRT, ECC, EFH, ETC, GDC, HAL, HCL, HDG, HIL, LUR, MRT, MRV, OC, PPG, SCP, SHX, STP, SVC, WTC, (2).
Polyethylene glycol monopalmitate	Yes	BRD, ETC, HCL, ICI, SHX.
Polyethylene glycol monopelargonate	Yes	ETC, HCL, SCP, SOS.
Polyethylene glycol monopelargonate, methoxylated	No	SCP.
Polyethylene glycol monoricinoleate	No	S.
Polyethylene glycol monostearate	Yes	AAC, APC, BRD, CPC, CRT, EFH, ETC, GDC, HDG, HIL, HRT, ICI, LUR, OC, PPG, SCP, SOS, STP, SVC, VKR, VND.
Polyethylene glycol sesquinoleate	No	ETC, SCP, SOS.
Polyethylene glycol terephthalate	No	BOE, PCI.
All other polyethylene glycol esters of chemically defined acids	No	ETC, HCL, RPC.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Polyethylene glycol esters—Continued		
Polyethylene glycol esters of mixed acids:		
Polyethylene glycol diester of coconut oil and oleic acids	No	EFH.
Polyethylene glycol diester of mixed linear alkyl acids/oleic acid	No	PCI.
Polyethylene glycol diester of tall oil acids	Yes	ARI, EFH, ETC, LUR, PAT, PPG, QCP, RDA, (2).
Polyethylene glycol ester of mixed fatty acids	No	SHX, SOS.
Polyethylene glycol monoester of coconut oil acids	Yes	CRT, ICI, LUR, WM.
Polyethylene glycol monoester of soybean oil acids	No	BAS, BRD.
Polyethylene glycol monoester of tall oil acids	Yes	BKM, CCC, EFH, FER, LUR, PPG, RDA.
Polyethylene glycol (mixed ester) of tall oil acids	No	CRT.
Polyethylene glycol sesquilester of coconut oil acids	No	ENJ, MRT, PAT, SCP.
Polyethylene glycol sesquilester of tall oil acids	Yes	ICI, SLM, WTC, (2).
Polyethylene glycol sesquilester of tallow acids	No	PAT, RPC, SCP, SHX, (2).
All other polyethylene glycol esters of mixed acid	No	ETC, LEA, SCP, WTC.
Polyglycerol esters:		
Hexaglycerol	No	SVC.
Mixed oleic, lauric, stearic, and palmitic hexaglycerol esters	No	SVC.
Polyglycerol decanoate	No	SCP.
Polyglycerol distearate	No	BRD, PPG.
Polyglycerol mono-oleate	Yes	HDG, PPG, WTC.
Polyglycerol monostearate	No	BRD, HDG, PPG, SVC.
Polyglycerol tetraoleate	No	PPG.
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 monolaurate	No	SBC.
1,2-Propanediol mono-oleate	No	EFH.
1,2-Propanediol monostearate	Yes	BRD, EKT, HAL, PPG, SBC, WM.
Other carboxylic acid esters:		
DI-isobutylene maleate	No	RH.
Ethoxylated 1,3-butylene glycol stearate	No	HCL.
Ethoxylated castor oil, dilitridecylmaleate	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 1,2-propanediol monostearate	No	ICI.
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	No	SVC.
Linoleic acid dimers, alkoxylated	No	(2).
Maleic anhydride, polypropylene glycol copolymer	No	PCI.
Methylglucoside laurate	No	HDG.
Mixed alkyl benzoate	No	APC.
Mixed alkyl stearate	No	SOS.
Pentaerythritol stearate	No	PPG, SCP.
Polyalkylene glycol oleate	No	SOS.
Polycarboxylic acid, alkylate	No	(2).
Polycarboxylic acid, alkylphenoxyalkoxylate	No	(2).
Polypropylene glycol diester of tall oil acids	No	RDA.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Other carboxylic acid esters—Continued		
Polypropylene glycol dioleate	No	(2).
Propylene glycol esters of hydrogenated palm oil	No	PG, VND.
All other carboxylic acid esters	No	ARI, CHP, HDG, MOA, ROB, SCP, SYL, WM, (2), (2).
Ethers:		
Benzoid ethers:		
Amylphenol-formaldehyde, alkoxyated	No	(2).
Bisphenol A, ethoxylated and propoxylated	No	PPG.
Bisphenol A, ethoxylated	No	PPG.
P-tert-Butylphenol-formaldehyde, alkoxyated	No	(2).
Dilsobutylphenol, ethoxylated	No	GAF.
Dinonylphenol, ethoxylated	Yes	CPC, ETC, GAF, HTN, PPG, RH, S, SCP, (2).
Dodecylphenol, ethoxylated	Yes	AAC, ETC, MON, SCP, TMH.
Epiclorohydrin bisphenol A, ethoxylated	No	(2).
Furfuryl alcohol, ethoxylated	No	SVC.
Iso-octylphenol, ethoxylated	Yes	AAC, BAS, GAF, PPG, RH, TMH.
(Mixed alkyl)phenol, alkoxyated	No	(2).
(Mixed alkyl)phenol epiclorohydrin-formaldehyde, alkoxyated	No	(2).
(Mixed alkyl)phenol, ethoxylated	No	BAS, MIL.
(Mixed alkyl)phenol, ethoxylated, butyl ether	No	RH.
(Mixed alkyl)phenol-formaldehyde, alkoxyated	Yes	ENJ, HCL, WTC. (2), (2).
Naphthalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone	No	PCI.
Naphthalenesulfonic acid, polymer with formaldehyde, sodium salt	No	PCI.
Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone, ammonium salt	No	PCI.
Nonylphenol, ethoxylated	Yes	AAC, BAS, CPC, ENJ, ETC, GAF, HCL, HDG, HTN, ICI, MIL, MOA, MON, OMC, PLX, PPG, RH, S, SCP, SHX, STP, TMH, TX, UCC, WTC. (2), (2), (2).
Nonylphenol, ethoxylated, phosphate esters	No	OMC.
Nonylphenol, ethoxylated and propoxylated	Yes	GAF, HCL, RH, SCP, TMH, WTC. (2).
Nonyl phenol, ethoxylated with mixed fatty acids	No	SOS.
Nonylphenol-formaldehyde, alkoxyated	Yes	WTC. (2), (2).
Nonyl phenol oleate, ethoxylated	No	SOS.
Nonylphenoxy poly(ethyleneoxy)ethyl iodide	No	GAF.
n-Octylphenol, ethoxylated	No	DUP, GAF, SCP.
tert-Octylphenol-formaldehyde, ethoxylated	No	SDW.
Phenol, ethoxylated	No	AAC, GAF, ICI, MIL, PPG, SCP.
Phenol-formaldehyde resin (with lignite)	No	PSP.
Phenol, propoxylated	No	RH.
Phenylstyrene, ethoxylated	No	HCL.
All other alkylphenol-formaldehyde condensates, alkoxyated	No	(2).
All other phenols, ethoxylated	No	AAC, HCL, SCP, SHX.
Nonbenzenoid ethers:		
Linear alcohols, alkoxyated:		
Butanol, ethoxylated	No	GAF.
Decyl alcohol, ethoxylated	Yes	BAS, CPC, ENJ, GAF, HCL, ICI, MIL, S, SCP.
Decyl alcohol, ethoxylated and propoxylated	No	GAF.
Decyloxy poly(ethyleneoxy)ethyl chloride	No	GAF.
Dodecyl alcohol, ethoxylated	Yes	AAC, BAS, GAF, HDG, ICI, MIL, PPG, (2).
Glycerol, ethoxylated	No	AAC, SVC.
Hexadecyl alcohol, ethoxylated	Yes	AAC, ICI, SCP.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic—Continued		
Ethers—Continued		
Nonbenzenoid ethers—Continued		
Linear alcohols,		
alkoxylated—Continued		
Isodecyl alcohol, alkoxylated	No	S.
Isostearyl alcohol, ethoxylated	No	SHX.
Methyl alcohol, alkoxylated	No	(²).
9-Octadecenyl alcohol, ethoxylated	Yes	AAC, GAF, ICI, MIR, S, SCP.
Octadecyl alcohol, ethoxylated	Yes	AAC, HCL, HTN, ICI, PPG, SCP.
Oleyl alcohol, ethoxylated	Yes	CPC, CRD, HCL, SHX.
Pelargonic alcohol, ethoxylated	No	GAF.
Stearyl alcohol, propoxylated	No	SVC.
All other chemically defined linear alcohols,		
alkoxylated	No	BAS, HDG, PPG, SCP.
Coconut oil alcohol, ethoxylated	No	ETC, GAF, HCL, TX.
Decyl and octyl alcohols, ethoxylated	No	AAC, GAF, SHX.
Decyl and octyl alcohols, ethoxylated and		
propoxylated	No	PPG.
Mixed linear alcohols, alkoxylated	No	WTC, (²).
Mixed linear alcohols, ethoxylated	Yes	AAC, BAS, DUP, GAF, HCL, HDG, ICI, MIL, MOA, PLX, RH, S, SCP, SHC, SHX, TMH, TNA, TX, UCC, VST, WTC.
Mixed linear alcohols, ethoxylated, benzyl ether	No	(²).
Mixed linear alcohols, ethoxylated and propoxylated	Yes	AAC, DUP, ETC, GAF, MIL, OMC, PPG, S, SCP, SHX, STP, SVC, UCC, (²).
Myristyl alcohol, propoxylated	No	WTC.
Sperm oil alcohol, ethoxylated	No	BAS.
Stearyl alcohol, propoxylated	No	AAC, WTC.
Tallow alcohol, ethoxylated	No	AAC, ENJ, ETC, HCL, PPG, TX.
Wool wax alcohols, ethoxylated	No	CRD.
All other mixed linear alcohols, alkoxylated	No	BRD, RH, SHC, (²).
Other ethers and thioethers:		
Bis-cumylphenyl-oxoethylene titanate	No	KPI.
1,3-Butylene glycol, ethoxylated	No	HCL.
Coconut fatty acid-ethoxylated nonylphenol ester	No	TCC.
tert-Dodecyl mercaptan, ethoxylated	No	AAC, GAF.
Glycerine, alkoxylated	No	(²).
Glycerol, alkoxylated, toluene diisocyanate		
copolymer	No	(²).
Isodecyl alcohol, ethoxylated	No	AAC, ETC, PPG.
Isodecyl alcohol, ethoxylated and propoxylated	No	AAC, ETC.
Iso-octyl alcohol, ethoxylated	No	ETC, PPG.
Lignin, ethoxylated	No	WVA.
Mixed alcohols, ethoxylated	Yes	ENJ, MIL, RH, SHX, WM, (²).
Polyepichlorohydrin	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	BAS, ETC, S, UCC, WTC, (²), (²).
Poly(mixed ethylene, propylene) glycol, capped with		
alkyl oxirane	No	(²).
Polyoxyalkylene glycols, alkoxylated	No	GAF.
Poly(oxy-1,2-ethanedyl), α -phenylmethyl- ω -hydroxy, C ₁₂ -C ₁₈ alkyl ethers	No	PCI.
Poly(oxy-1,2-ethanedyl), α -phenylmethyl- ω -hydroxy, ethoxylated nonylphenol alkyl ether	No	PCI.

See footnotes at end of table.

Table 12-2—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Surface-active agents	Separate statistics ¹	Manufacturers' identification codes (according to list in table 12-3)
Nonionic—Continued		
Ethers—Continued		
Other ethers and thioethers—Continued		
Polypropylene glycol, alkoxylated, polymer with maleic anhydride, acrylic acid, and alkylphenol-formaldehyde resin, alkoxylated	No	(²).
Polypropylene glycol, ethoxylated	No	BAS, ETC, GAF, HCL, HDG, PPG, SCP, WTC, (²).
Polypropylene glycol glycerol triether, copolymer with epichlorohydrin bisphenol epoxy resin	No	(²).
2,4,7,9-Tetramethyl-5-decyne-4,7-diol, ethoxylated	No	GAF, SCP.
Tridecyl alcohol, ethoxylated	Yes	AAC, CPC, DUP, ETC, HCL, ICI, MIL, PPG, S, SCP, WTC, (²).
Tridecyl alcohol, propoxylated and ethoxylated	No	ETC, GAF, HTN, PPG, TX.
Trimethylnonyl alcohol, ethoxylated	No	PPG, UCC.
Trimethylpropane, alkoxylated	No	AAC, BAS, GAF, WTC, (²).
All other ethers and thioethers	No	HCL, OMC, RH, SCP.
Other nonionic surface-active agents:		
Cumyl phenolate, isopropoxytitanium salt	No	KPI.
Formaldehyde, dicyandiamide, ethylene sulfate polymers	No	PCI.
(Mixed alkyl)phenol alkylenediaminealkanolamine formaldehyde	No	(²).
Mixed fatty acid-ethoxylated nonylphenol ester	No	RPC.
Tetra-(2,2-diallyloxymethylene)-1-butoxytitanium bis-(ditridecyl) phosphite	No	KPI.
Tetra-isopropoxytitanium(bis dioctyl)phosphite	No	KPI.
Tetra-octyloxytitanium(bis-tridecyl)phosphite	No	KPI.
Tri(castor oil alkyl)phosphate	No	BRD.
All other nonionic surface-active agents	No	BAS, BRI, CGY, CLU, DUP, GAF, HCL, ICI, LUR, MIL, MOA, PG, SCP, WM, WVA, (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 12-3
Surface-active agents: Directory of manufacturers, alphabetical by code, 1989

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

Table 12-3—Continued

Surface-active agents: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
RDA	Rhone-Poulenc, Inc.	TCC	Sybron Chemicals, Inc.
RH	Rohm & Haas Co.	TEN	Tennessee Chemical Co.
ROB	Robeco Chemicals, Inc.	TMH	Harcros Chemicals, Inc.
RPC	Colloids, Inc., Lyndal Div	TNA	Ethyl Corp.
RSA	R.S.A. Corp.	TNI	Gillette Chemical Co.
S	Sandoz, Chemical Corp., Colors & Chemicals Div.	TX	Texaco Chemical Co.
SBC	Scher Chemicals, Inc.	UCC	Union Carbide Corp., Industrial Chemical Div.
SBP	SBS Products Inc.	UDI	Desoto, Inc.
SCO	Scholler, Inc.	UNN	United Aniline Co.
SCP	Henkel Corp.	UPF	Sloss Industries
SDC	Sandoz Chemical Corp.	USR	Uniroyal Chemical Co., Inc.
SDW	Sterling Drug, Inc., Sterling Organics Div.	UTC	Unitex Chemical Corp.
SHC	Shell Oil Co., Shell Chemical Co.	VKR	Virkler Co.
SHX	Sherex Chemical Co., Inc.	VND	Van Dyk, Div. of Mallinckrodt, Inc.
SLC	Soluol Chemical Co., Inc.	VST	Vista Chemical Inc.
SLM	Salem Oil & Grease Co.	WBG	Dryden Oil Co., White and Bagley Div.
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.	WVA	Westvaco Corp.
SYL	Arizona 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 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 1989 amounted to 572 million kilograms, 8 percent more than the 528 million kilograms reported for 1988 (table 13-1). Sales in 1989 were 461 million kilograms, an increase of 9 percent, as compared with 424 million kilograms reported in 1988; the value of sales was \$5,203 million in 1989, compared with \$4,354 million in 1988—an increase of 20 percent. Data for production of pesticides and related products during 1985-89 are shown in figure 13-1.

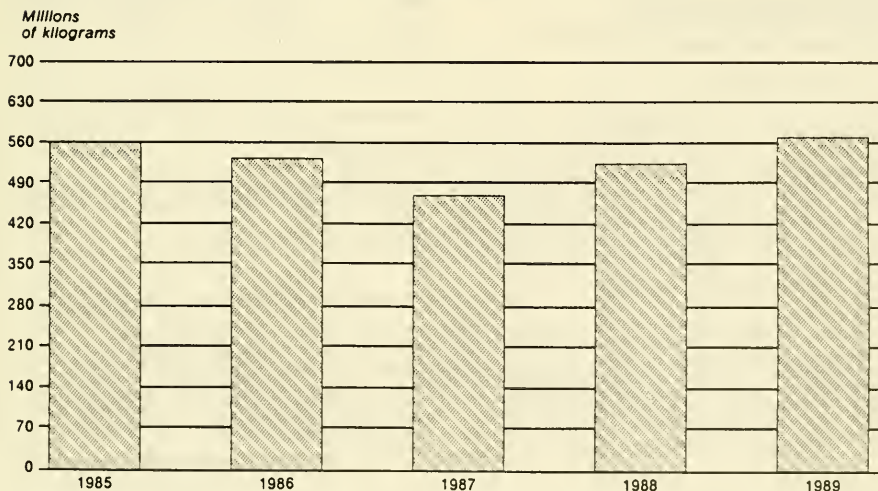
The output of cyclic pesticides and related products amounted to 366 million kilograms in 1989, 6 percent more than the 345 million kilograms produced in 1988. Sales in 1989 were 287 million kilograms, valued at \$3,639 million, compared with 259 million kilograms, valued at \$3,054 million, in 1988.

Production of acyclic pesticides and related products in 1989 amounted to 206 million kilograms, compared with 183 million kilograms reported for 1988. Sales in 1989 were 174 million kilograms, compared with 165 million kilograms reported for 1988; the value of sales was \$1,563 million in 1989, compared with \$1,299 million in 1988.

Table 13-2 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 13-3.

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202-252-1363
(Effective 1/14/91 202-205-3363)

Figure 13-1
Pesticides and related products: U.S. production, 1985-89



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

Table 1-1

Pesticides and related products: U.S. production and sales, 1989

Pesticides and related products	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	572,386	461,172	5,202,782	\$11.28
Cyclic				
Total	365,900	286,745	3,639,436	12.69
Fungicides ²	40,385	33,297	253,075	7.60
Herbicides and plant growth regulators, total	262,400	200,450	2,464,433	12.29
3',4'-Dichloropropanilide (Propanil)	5,008	(³)	(³)	(³)
Phenoxyacetic acid derivatives	11,655	26,234	70,080	2.67
All other cyclic herbicides ⁴	245,737	174,216	2,394,353	13.74
Insecticides and rodenticides, total	59,484	50,442	878,419	17.41
Chlorinated insecticides	1,621	1,396	15,132	10.84
Organophosphorus insecticides ⁵	25,828	19,815	324,981	16.40
All other cyclic insecticides and rodenticides ⁶	32,035	29,231	538,306	18.42
All other cyclic pesticides	3,631	2,556	43,509	17.02
Acyclic				
Total	206,486	174,427	1,563,346	8.96
Fungicides ⁷	9,932	6,868	41,843	6.09
Herbicides and plant growth regulators ⁸	53,700	59,174	834,907	14.11
Insecticides, rodenticides, soil conditioners, and fumigants, total	132,904	98,619	643,173	15.85
Organophosphorus insecticides ⁹	39,283	18,510	274,301	14.82
N-Methylthiocarbamic acid (Metham)	14,809	12,206	16,108	1.32
Trichloronitromethane (chloropirrin)	11,998	3,892	8,998	2.31
All other acyclic insecticides, rodenticides, soil conditioners, and fumigants ¹⁰	66,814	64,011	343,766	5.37
All other acyclic pesticides	9,950	9,766	43,423	4.45

¹ Calculated from unrounded figures.² Includes benomyl, captan, chlorothalonil, DMTT, folpet, ipron, 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, diuron, DNBP, isopropyl phenylcarbamates (IPC and CIPC), maleic hydrazide, molinate, NPA, picloram, prometon, triazines, trifluralin, plant growth regulators, and others.⁵ Includes diazinon, methyl parathion, and other phosphorothioates and phosphorodithioates.⁶ Includes carbaryl, chlorinated insecticides (chlordan, heptachlor, and others), insect attractants, DEET and other insect repellents, small amounts of rodenticides, and others.⁷ Includes dithiocarbamates.⁸ Includes butylate, EPTC, methanearsonic acid salts, thiocarbamates, and organophosphorus herbicides, and others.⁹ Includes acephate, disulfoton, ethion, malathion, phorate, and other organophosphorus insecticides.¹⁰ Includes 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, dimethylthiocarbamic acid, sodium salt and dimethylthiocarbamic 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 13-2

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 13-3)
Cyclic	Yes	
	Yes	
Fungicides:		
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-(4-chlorophenyl)ethyl]- α -(1,1-dimethylethyl)-1h-1,2,riazole-1-ethanol	No	CHG.
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.
Hexahydro-1,3,5-triethyl-s-triazine	No	VNC.
Hexahydro-1,3,5-tri(2-hydroxyethyl)-s-triazine	No	(?).
2-Mercaptobenzothiazole, sodium salt	No	(?).
Methyl-1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	No	DUP, GTL.
3-(2-Methylpiperidino)propyl-3,4-dichlorobenzoate (Pipron)	No	LIL, USR.
Naphthenic acid, copper salt	No	CCA, NOD, TRO.
2-n-Octyl-4-isothiazolin-3-one	No	RH.
Pentachlorophenol, sodium salt	No	FRO.
8-Quinolol, copper salt	No	NOD.
8-Quinolol, magnesium salt	No	FMT.
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:		
3-Amino-2,5-dichlorobenzoic acid, ammonium salt		
(2,5-Dichloro-3-aminobenzoic acid, ammonium salt)	No	RDA.
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 (Pcloram)	No	DQW, ICI.
S-Benzyl thiocarbamate	No	
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.
2-(tert-Butylamino)-4-ethylamino-6-(methylthio)-s-triazine	No	CGY, DUP.
3-tert-Butyl-5-chloro-6-methyluracil	No	
N-Butyl-N-ethyl- α , α -trifluoro-2,6-dinitro-p-toluidine (Benefin)	No	LIL.
Butyl 2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoate	No	(?).
1-(Carboethoxy)ethyl 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoate	No	SOC.
2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	No	CGY.
2-Chloro-4,6-bis(isopropylamino)-s-triazine (Propazine)	No	CGY.
2-Chloro-2',6'-diethyl-N-(n-butoxymethyl)-acetanilide (Butachlor)	No	MNA.

See footnotes at end of table

Table 13-2—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 13-3)
Cyclic—Continued	Yes	
Herbicides and plant growth regulators—Continued		
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-methylpropanitrile (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-isoxazolone	No	FMN, (?).
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	No	DUP.
3,5-Dibromo-4-hydroxybenzonitrile (Bromoxynil)	No	RDA.
3,6-Dichloro-2-anisic acid (Dicamba)	No	ZOC.
2,6-Dichlorobenzonitrile	No	USA.
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-yl-methyl]-1H-1,2,4-triazole	No	ICI.
2-(3,5-Dichlorophenyl)-2-(2,2,2-trichloroethyl)-oxirane (tridiphane)	No	DOW.
3,6-Dichloropicolinic acid	No	DOW.
3',4'-Dichloropropionanilide (Propanil)	Yes	CED, CYT, RH.
3,7-Dichloro-8-quinolinic acid	No	BAS, NES.
S-(O,O-Diisopropyl phosphorodithioate) ester of N-(α -mercaptoethyl)benzenesulfonamide (Bensulfide)	No	ICI.
1,1'-Dimethyl-4,4'-bipyridinium dichloride	No	(?).
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.
2,6-Dinitro-N,N-dipropyl cumidine	No	LIL.
3,5-Dinitro-N4,N4-dipropylsulfanilamide	No	LMC.
2-(Ethylamino)-4-(isopropylamino)-6-(methylthio)-s-triazine (Ametryne)	No	CGY.
Ethyl 2-[[[(4-chloro-6-methoxypyrimidin-2-yl)-amino]carbonyl]amino]sulfonyl]benzoate (Chlorimuron ethyl)	No	DUP.
S-Ethyl cyclohexylmethylthiocarbamate	No	ICI.
S-Ethyl-hexahydro-1H-azepine-1-carbothioate (Mollinate)	No	ICI.
(+)-5-Ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazoln-2-ylcotinic acid	No	ACY.

See footnotes at end of table.

Table 13-2—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 13-3)
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
N-[3-(1-Ethyl-1-methylpropyl)-5-Isoxazolyl]-2,6-dimethoxybenzamide (Flexidor)	No	LIL.
N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine	No	ACY.
Imazaquin 2-4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1hidazol-2-ylquinoline-carboxylic acid	No	ACY.
Imazethbenz methyl ester (ci22,293)	No	ACY.
Isopropyl N-(3-chlorophenyl)carbamate (CIPC)	No	SOC.
Methyl-3-[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]amino]sulfonyl]-2-thiophene-carboxylic acid	No	DUP.
2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanolamine salt	No	RIV.
2-(2-Methyl-4-chlorophenoxy)propionic acid, iso-octyl ester	No	RIV.
1-(2-Methylcyclohexyl)-3-phenylurea (Slduron)	No	ADC, DUP.
Methyl 5-(2',4'-dichlorophenoxy)-2-nitrobenzoate	No	RDA.
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.
Methyl 2[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-amino]carbonyl]amino]sulfonyl]benzoate (Metsulfuron methyl)	No	DUP.
Methyl 2-[[[(N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)thylamino)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.
Nicotinic acid, 2-(4-Isopropyl-4-methyl-5-oxo-2-Imidazolin-1)	No	ACY.
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, iso-octyl ester	No	RIV.
2,4-Dichlorophenoxyacetic acid, esters and salts:		
2,4-Dichlorophenoxyacetic acid (2,4-D)	No	DOW, GTH.
2,4-Dichlorophenoxyacetic acid,2-butoxyethyl ester	No	DOW.
2,4-Dichlorophenoxyacetic acid, n-butyl ester	No	RIV.
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.
2,4-Dichlorophenoxyacetic acid, iso-octyl ester	No	DOW, RIV.
2,4-Dichlorophenoxyacetic acid, isopropyl ester	No	AMV.
Trimethylsulfoniumcarboxymethyl aminophosphonate	No	ICI.
All other phenoxyacetic acid derivatives	No	RDA.
Plant growth regulators:	No	
N-[(Acetylamino)methyl]-2-chloro-N-(2,6-diethylphenyl)acetamide	No	MNA.
2-Chloro-N-(2,6-dinitro-4-(trifluoromethyl)phenyl)-N-ethyl-6-fluorobenzenemethanamine	No	CGY

See footnotes at end of table.

Table 13-2—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 13-3)
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
Plant growth regulators—Continued		
β-(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 (Ancyridol)	No	LIL.
2,3-Dihydro-5,6-dimethyl-1,4-dithiin-1,1,4,4-tetraoxide	No	NES.
1,2-Dihydro-3,6-pyridazinedione (Maleic hydrazide) (MH)	No	DRX, USR.
1,1-Dimethylpiperidinilum 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.
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:	No	
N,N-Diethyltoluamide (DEET)	No	HCL, PAC, TNA, (?)
All other insect attractants	No	(?)
Insecticides:	Yes	
Bacillus thuringiensis	No	ABB, ZOC.
Bis(pentachloro-2,4-dicyclopentadien-1-yl)	No	ZOC.
2,3,4,5-α-2-Butenylene-tetrahydrofurfural	No	PLC.
2-(p-tert-Butylphenoxy)cyclohexyl-2-propynyl sulfite	No	USR.
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate	No	FMN.
Cyano-3-phenoxybenzyl-cis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	No	(?)
Cyano(3-phenoxyphenyl)methyl-4-chloro-α-(1-methylethyl)benzeneacetate	No	DUP.
N-Cyclopropyl-1,3,5-triazine-2,4,6-triamine	No	CGY.
Cypermethrin	No	CED, FMN.
O,O-Diethyl O-(2-diethylamino-6-methyl-4-pyrimidinyl)phosphorothioate	No	ICI.
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl[(diethylamino)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	(?)
5,6-Dimethyl-2-dimethylamino-4-pyrimidinyl dimethyl carbamate	No	FSN.
Di-n-propylsoclnchomeronate	No	MGK.
Distinnaxane, hexakis(2-methyl-2-phenylpropyl)	No	DUP.
O-Ethyl S,s-di-sec-butyl phosphorodithioate	No	FMN.
Methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-3-cyano-3-phenoxyphenylcyclopropanecarboxylate	No	FMN.
1-Naphthyl N-methylcarbamate (Carbaryl)	No	RDA.

See footnotes at end of table.

Table 13-2—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 13-3)
Cyclic—Continued		
Insecticides—Continued		
3-(Phenoxyphenyl) methyl-cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropanecarboxylate	No	CED, FMN, (?).
Tetrahydro-3,5-dimethyl-2(1H)-pyrimidinone [3-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]ethenyl]-2-propenylidene] hydrozone	No	ACY.
All other cyclic insecticides	No	FMN, ZOC, (?).
Chlorinated Insecticides:	Yes	
2-Chloro-N-[[[4-(trifluoromethoxy)phenyl]amino]-carbonyl]benzamide	No	CHG.
Heptachloro-tetrahydro-endo-methanoidene (Heptachlor)	No	VEL.
Octachlorohexahydro-4,7-methanoidene (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:	Yes	
O-(2,4-Dichlorophenyl) O-ethyl S-propyl phosphorodithioate	No	CHG.
O-(2-(Diethylamino)-6-methyl (4-pyrimidinyl) O,O-dimethyl phosphorothioate	No	(?).
O,O-Diethyl O-(2-isopropyl-4-methyl-6-pyrimidinyl) phosphorothioate (Diazinon)	No	CGY.
O,O-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate	No	DOW.
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.
All other organophosphorus insecticides, cyclic	No	(?).
Rodenticides:	No	
3-(α -Acetylbenzyl)-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-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:		
α -[2-(2-n-Butoxyethoxy)ethoxy]-4,5-methylenedioxy-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-triazol-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	MNA, (?).
Acyclic		
Fungicides:	Yes	
Bis-1,4-bromoacetoxy-2-butene	No	VIN.

See footnotes at end of table.

Table 13-2—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 13-3)
Acyclic—Continued		
Fungicides—Continued		
Bis(tributyltin) oxide	No	(²).
1,2-Dibromo-2,4-dicyanobutane	No	MRK.
Disodium cyanodithiolimidocarbonate	No	BKM.
n-Dodecylguanidine acetate (Dodine)	No	ACY, 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-Chloroallyl diethyldithiocarbamate (CDEC)	No	AC.
S-Ethyl diisobutyldithiocarbamate (Butylate)	No	ICI, SOC.
S-Ethyl dipropylthiocarbamate (EPTC)	No	ICI, 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.
Methylthioulfonic 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 phosphorotrithioate	No	CHG.
Tributyl phosphorotrithioate (Merphos)	No	RDA.
Plant growth regulators:		
6-Benzyladenine (BAP)	No	ABB.
2-(Chloroethyl)phosphonic acid	No	RDA.
N-(Phosphonomethyl)glycine, sodium sesqui salt	No	MNA.
All other acyclic herbicides	No	DUP, VIN.
Insecticides:		
Ethyl 3,7,11-trimethyldodeca-2,4-dienoate	No	DOW, ZOC, (²).
Isopropyl-11-methoxy-3,7,11-trimethyldodeca-2,4-dienoate	No	ZOC, (²).
Methyl N', N'-dimethyl-N-[(methylcarbamoyl)oxy]-1-thiooxamidate	No	DUP.
S-Methyl-N-[(methylcarbamoyl)oxy]thioacetimidate (Methomyl)	No	DUP, RDA.
2-Methyl-2-(methylthio)propionaldehyde O-(methylcarbamoyl)oxime (Aldicarb)	No	RDA.
N,N'-thiobis-(methylimino)carbonyloxy bis-ethanimidothioate	No	RDA.
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.

See footnotes at end of table.

Table 13-2—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Pesticides and related products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 13-3)
Acyclic—Continued		
Insecticides—Continued		
Organophosphorus Insecticides—Continued		
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,O,O',O'-Tetraethyl S,S'-methylene bisphosphorodithioate (Ethion)	No	FMN.
All other acyclic insecticides	No	DUP.
Rodenticides:	No	
2-Hydroxyethyl n-octyl sulfide	No	PLC.
Sodium fluoroacetate	No	TUL.
Soil conditioners:		
Polyacrylonitrile, hydrolyzed, sodium salt	No	ACY.
Soil fumigants:		
1,3-Dichloropropene	No	DOW.
O-Ethyl S,S-dipropyl phosphorodithioate	No	RDA.
Methyl bromide (Bromomethane)	No	GTL.
N-Methyldithiocarbamic acid, sodium salt (Metham)	Yes	AMV, BKM, CED, ICI.
Methyl isothiocyanate and 1,3-dichloropropene	No	MRT.
Trichloronitromethane (Chloropicrin)	Yes	GTL, LCP, NLO, TNA.
All other acyclic pesticides:	No	
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	No	(²).
Ammonium oxydiethylenebis (alkyl* dimethyl chloride)		
* Alkyl—40% C ₁₂ , 50% C ₁₄ , 10% C ₁₆	No	BKM.
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	CHD, USR, ZOC.

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 13-3

Pesticides and related products: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
ABB	Abbott Laboratories	ICI	ICI Americas, Inc., Agricultural Chemicals Div.
AC	AC&S, Inc.	LCP	LCP Chemicals-Maine
ACY	American Cyanamid Co.	LIL	Eli Lilly & Co.
ADC	Anderson Development Co.	LMC	Lomac, Inc.
ALC	Alco Chemical Corp.	MGK	McLaughlin Gormley King Co.
ALP	Alpha Laboratories, Inc.	MMM	Minnesota Mining & Manufacturing Co.
AMV	Amyvac Chemical Corp.	MNA	Monsanto Agricultural Co.
BAS	BASF Corp.	MOT	Motomco, Ltd.
BKM	Buckman Laboratories, Inc.	MRK	Merck & Co., Inc.
CCA	Akzo Chemicals, Inc.	MRT	Morton International, Inc., Morton Chemical Div.
CED	Cedar Chemical Co.	NES	Rutgers-Nease Chemical Co.
CGY	Ciba-Geigy Corp.	NLO	Niklor Chemical Co., Inc.
CHD	Chemdesign Corp.	NOD	Huls America, Inc.
CHF	Kincaid Enterprises, Inc.	PAC	Pacific Anchor Chemical Corp.
CHG	Mobay Chemical Corp., Agricultural Chemicals Div.	PAS	Atochem North America, Inc.
CYT	Cumberland International Corp.	PBI	PBI-Gordon Corp.
DOW	Dow Chemical Co.	PLC	Phillips 66 Co.
DRX	Drexel Chemical Corp.	RDV	Rhone-Poulenc, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Agricultural Products	RH	Rohm & Haas Co.
FER	Ferro Corp., Bedford Chemical Div.	RIV	Riverdale Chemical Co.
FMN	FMC Corp., Agricultural Chemical Group	SDS	Fermenta, ASC Corp.
FMT	Fairmount Chemical Co., Inc.	SOC	Chevron Corp., Chevron Chemical Co.
FRI	Farmland Industries, Inc.	TNA	Ethyl Corp.
FRO	Vulcan Materials Co., Chemicals Div.	TRO	Troy Chemical Corp.
FSN	Nor-am Chemical Co.	TUL	Tull Chemical Co., Inc.
GTH	Guth Corp.	USR	Uniroyal Chemical Co., Inc.
GTL	Great Lakes Chemical Corp.	VCC	Vinings Chemical Co.
HCL	Hoescht Celanese Corp., Fine Chemicals, Div.	VEL	Velsicol Chemical Corp.
		VIN	Vineland Chemical Co., Inc.
		VNC	Vanderbilt 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 1986.

In 1989, the production of miscellaneous end-use chemicals amounted to 13,503 million kilograms, an increase of 4.3 percent from the calculated 12,940 million kilograms of production for 1988 (table 14-1). Production of these chemicals remained nearly level but steadily increasing throughout 1986-89 (figure 14-1). Sales in 1989 totaled 9,278 million kilograms, valued at \$9,759 million (table 14-1). The sales quantity decreased 9.2 percent from that of 1988 with the value of sales increasing by 3.3 percent. Polymers for fibers and end uses of urea

collectively accounted for 59 percent of the 1989 production of these miscellaneous end-use chemicals. The total published end-uses for urea accounted for 54.7 percent of the 1989 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 1989 totaled 3,988 million kilograms, an increase of 43.8 percent from the previous year. Approximately 93.6 percent of production in this category was methyl t-butyl ether. The increase of 57.3 percent in reported production from 1987 is due to the increasing demand for this chemical as an octane enhancer as well as adjustments to production data for companies that had failed legal reporting requirements.

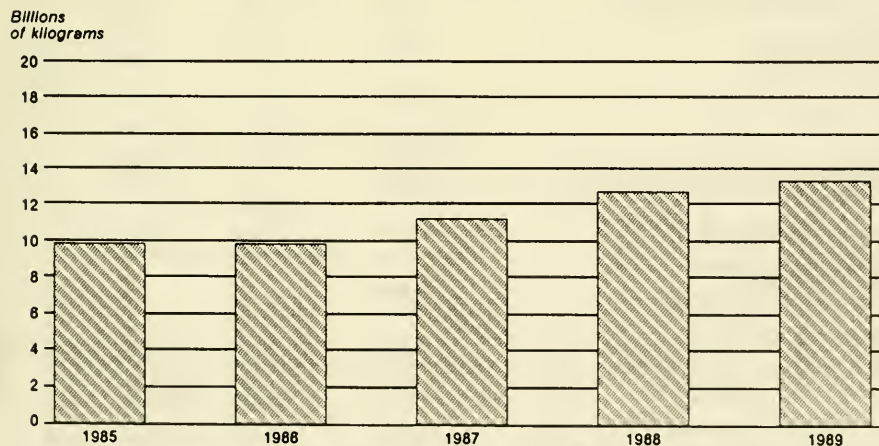
Table 14-2 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 14-3.

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Figure 14-1
Miscellaneous End-Use Chemicals and Chemical Products: U.S. production, 1985-89



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

Table 14-1

Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1989

Miscellaneous end-use chemicals and chemical products	Production	Sales		Average Unit value ¹
		Quantity	Value	Per kilogram
	1,000 kilograms	1,000 kilograms	1,000 dollars	
Grand total	13,502,723	9,278,044	9,759,477	\$1.05
Chelating agents, nitriloacids and salts, total	111,019	90,670	137,869	1.52
(Diethylenetri-nitrilo)pentaacetic acid, pentasodium salt	9,558	6,144	10,335	1.68
(Ethylenedinitrilo)tetraacetic acid (EDTA)	2,546	1,503	3,254	2.16
(Ethylenedinitrilo)tetraacetic acid, disodium salt	740	718	3,243	4.51
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	818	681	2,320	3.41
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	29,283	23,032	35,486	1.54
(N-Hydroxyethylethylenedinitrilo)tri-acetic acid, trisodium salt	5,103	1,646	2,798	1.70
All other chelating agents, nitriloacids and salts	62,971	56,946	80,433	1.41
Chemical indicators	2	2	408	269.76
Chemical reagents and fine chemicals	326	317	51,640	162.86
Enzymes:				
Bacterial amylase	(²)	(²)	22,727	(²)
Other hydrolytic enzymes	(²)	(²)	5,766	(²)
Rennin	(²)	(²)	16,997	(²)
Flotation reagents	9,088	8,010	5,878	.73
Fuel additives, total ³	3,988,314	1,441,583	1,144,360	.79
Methyl t-butyl ether ⁴ *	3,731,816	1,263,519	614,058	.49
All other fuel additives	256,498	178,064	530,302	2.98
Lubricating oil and grease additives, total	327,897	302,469	513,774	1.70
Oil soluble petroleum sulfonate, barium salt	2,070	1,824	6,684	3.66
Oil soluble petroleum sulfonate, calcium salt	98,813	86,931	157,677	1.81
All other lubricating oil and grease additives	227,014	213,714	349,413	1.63
Paint driers, naphthenic acid salts, total ⁷ *	3,164	2,831	9,869	3.49
Cobalt naphthenate	1,131	1,074	5,772	5.37
All other paint driers	2,033	1,757	4,097	2.33
Photographic chemicals	8,949	4,644	59,766	12.87
Polymers for fibers, total ⁸	2,614,198	1,476,570	5,082,993	3.44
Nylon 6 and 6/6 ⁴ *	1,157,971	714,208	2,731,828	3.82
Polyacrylonitrile and acrylonitrile copolymers ⁸	238,906	(²)	(²)	(²)
All other polymers for fibers	1,217,321	762,362	2,351,165	3.08
Polymers, water soluble, total	295,636	247,986	670,765	2.70
Cellulose esters and ethers:				
Hydroxethylcellulose	15,906	(²)	(²)	(²)
Sodium carboxymethylcellulose	22,247	(²)	(²)	(²)
Polyacrylic acid salts, total	119,260	100,508	234,398	2.33
Sodium ammonium polyacrylate and copolymers	64,928	61,110	133,959	2.19
All other polyacrylic acid salts	54,332	39,398	100,439	2.55
All other water soluble polymers	138,223	147,477	436,367	2.96

See footnotes at end of table.

Table 14-1—Continued

Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1989

Miscellaneous end-use chemicals and chemical products	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Poly- α -olefins	51,512	51,162	114,283	2.23
Tanning materials synthetic	17,839	8,793	19,321	2.20
Textile chemicals, other than surface-active agents	22,328	20,692	31,005	1.50
Urea in compounds or mixtures:				
In feed compounds	172,603	168,007	27,846	.17
In liquid fertilizer	1,275,520	1,061,381	170,034	.16
In solid fertilizer	3,920,334	3,844,652	498,483	.13
All other miscellaneous end-use chemicals and chemical products ²	683,994	548,276	1,175,713	2.14

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, 1989)*, 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 Production totals shown for this chemical include quarterly production in instances where annual data were determined to be inaccurate.⁷ Quantities are given on the basis of solid naphthenate.⁸ Statistics exclude production and sales of copper naphthenate. Statistics for copper naphthenate are given in the section on "Pesticides and Related Products."⁹ Quarterly production data for polyethylene terephthalate are incorrect reporting. Annual production figures cannot be published because disclosure would result.

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

Table 14-2
Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14-3)
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	AJI, HCC.
All other amino acids and salts, acyclic	No	TRD.
Biological stains:		
Biological stains	No	ALD, EK.
Chelating agents, nitriloacids and salts:		
N-alkylamine bismethylenephosphonic acid	No	DUP.
(Diethylenetriamine)pentamethylenephosphonic acid	No	MYO, (2).
(Diethylenetriamine)pentamethylenephosphonic acid, sodium salt	No	MYO.
(Diethylenetriamino)triacetic acid	No	CGY, DOW, HMP.
(Diethylenetriamino)triacetic acid, monosodium hydrogen ferric salt	No	CGY.
(Diethylenetriamino)triacetic acid, penta-sodium salt	Yes	CGY, DOW, HMP.
N,N-Dihydroxyethylglycine, sodium salt	No	HMP.
Ethanoldiglycine, disodium salt	No	HMP.
(Ethylenedinitrilo)tetraacetic acid	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	No	CGY, DAN, DOW.
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	No	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	No	DAN, DOW, HMP.
(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.
(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	Yes	CGY, HMP, TX.
Glucosheptonic acid, β -isomer, sodium salt	No	BLZ.
Glucosheptonic acid, sodium salt	No	BLZ, PFN.
Hexamethylenediaminetetra(methylenephosphonic acid), potassium salt	No	MYO.
Hydroxyethane-1-diphosphonic acid	No	MYO.
(N-Hydroxyethylethylenedinitrilo)triacetic acid, iron salt	No	DOW, HMP.
(N-Hydroxyethylethylenedinitrilo)triacetic acid, magnesium salt	No	DOW.

See footnotes at end of table.

Table 14-2—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in Table 14-3)
Chelating agents, nitriloacids and salts—Continued		
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt	Yes	CGY, DOW, HMP.
Hydroxyethylidene diphosphonic acid, potassium salt	No	(²).
Hydroxyethylidene diphosphonic acid, sodium salt	No	MYO, (²).
Nitriloacetic acid, zinc salt	No	HMP.
Nitrilotriacetic acid	No	HMP, MON.
Nitrilotriacetic acid, trisodium salt	No	HMP.
Nitrilo-tris-methylene triphosphonic acid	No	BKM, MYO, (²).
Nitrilo-tris-methylene triphosphonic acid, potassium salt	No	(²).
Nitrilo-tris-methylene triphosphonic acid, sodium salt	No	MYO, (²), (²).
2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	No	(²).
Polyamine polymethane phosphonic acid	No	(²), (²).
Polyamine polymethane phosphonic acid, magnesium salt	No	RPC.
All other chelating agents, nitriloacids and salts	No	BKM, CGY, HMP, OMC, (²), (²).
Chemical indicators	Yes	ALD, EK, GFS.
Chemical reagents and fine chemicals	Yes	ALD, COC, EK, ENJ, GFS, PAH, PFN, PIC, PLB, REG, RSA, UPJ, UPM, (²).
Enzymes:	Yes	
Hydrolytic enzymes:		
Amylases:		
Bacterial amylase	Yes	GBF, GNR, MLS, NBI, PMP.
Glucosylase	No	GBF, MLS, NBI.
All other amylases	No	GBF, TX.
Proteases:		
Cellulase	No	GBF.
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.
Hydrolytic enzyme mixtures	No	JFR.
Lipase	No	CHH, GNR.
Pectinase	No	GBF, GNR.
All other hydrolytic enzymes	No	GNR, PMP, (²).
Non-hydrolytic enzymes:		
Cholesterol oxidase	No	BCK, UPJ.
Glucose oxidase	No	BCK.
Glucose-6-phosphate dehydrogenase	No	BCK.
Flotation reagents:		
Allyl n-butyl trithiocarbonate	Yes	CED.
Phosphorodithioates, used as flotation reagents:		
Dicresylphosphorodithioic acid	No	ACY.
Dicresylphosphorodithioic acid, ammonium salt	No	ACY.
Dicresylphosphorodithioic acid, sodium salt	No	(²).
Rosin amines	No	HPC, SHX.
Thiocarbamides (Diphenylthiourea)	No	ACY.
Xanthates and sulfides, used as flotation reagent:		
Sodium n-butylxanthate	No	USR.
Sodium ethylxanthate	No	SCP.
All other flotation reagents	No	CED, DAN, SHX, (²).
Fuel additives:		
Diesel fuel additives:		
Hexyl nitrate	No	DUP.
All other diesel fuel additives, acyclic	No	TNA.
All other diesel fuel additives, cyclic	No	PAH.

See footnotes at end of table.

Table 14-2—Continued
Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14-3)
Fuel additives—Continued		
Fuel oil additives:		
Adipic acid-diethylenetriamine-epichlorohydrin polymer	No	(2).
Barium hydrocarbon phosphate ester	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'-Disallyldene-1,2-propanediamine	No	DUP, FER, SM, TNA.
Ethoxylated hydantoin glycol dicocate	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.
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.
Tetrahydroimidine from tall oil fatty acids and propylenediamine	No	(2).
All other fuel additives, acyclic	No	DUP, SM, UPM.
Gasoline additives:		
N,N'-DI-sec-butyl-p-phenylenediamine	No	DUP, UPM.
N,N'-DIsopropyl-p-phenylenediamine	No	DUP, TNA.
Ethylene dibromide	No	GTL, TNA.
Methyl-t-amyl ether	No	CXI.
Methyl-t-butyl ether	Yes	AMO, ATR, CGO, CSD, CSP, DA, DUP, ENJ, GRS, LYP, MOC, SM, PLC, SOG, SUN, SWR, TPC, TX, VLR.
Methylcyclopentadienylmanganese tricarbonyl	No	TNA.
N-(1-Methylheptyl)ethanolamine	No	UPM.
Tetraethyl lead	No	DUP.
All other gasoline additives, acyclic	No	ATR, TNA, TX, UPM, (2).
All other gasoline additives, cyclic	No	VNC.
Lubricating oil and grease additives:		
Alkene thiophosphonate	No	TX.
Alkyl imidazoline	No	(2).
Alkyl succinic anhydride	No	SM, TNA.
Alkyl terephthalamate	No	SOC.
Bornyl phenylamine	No	SOC.
Chlorosulfurizer and sulfurized compounds:		
Chlorosulfurized sperm oil	No	ELC.
Sulfurized lard oil	No	CCW.
Sulfurized sperm oil substitutes	No	CCW, ELC.
DI-2-ethylhexylphosphorodithiolic acid	No	ELC.
DIsopropyl hydrogen phosphite	No	ALW.
DI-N-propylphosphorodithiolic acid	No	ELC.
Dodecyl succinic anhydride	No	TX.
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.
Hydrocarbon carboxylic acid derivatives	No	SCP, (2), (2), (2).
Hydrocarbon phosphorous acid, barium salt	No	(2).
Hydrocarbon phosphoryl derivatives	No	(2).

See footnotes at end of table.

Table 14-2—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14-3)
Lubricating oil and grease additives—Continued		
Methylene-bridged polyalkyl phenols	No	TX.
Mixed polyesters	No	HCC.
Oil-soluble petroleum sulfonates:		
Oil-soluble petroleum sulfonate, barium salt	Yes	PAR, TNA, WTC, (?).
Oil-soluble petroleum sulfonate, calcium salt	Yes	PAR, SOC, TNA, TX, WTC, (?).
Oil-soluble petroleum sulfonate, magnesium salt	No	WTC, (?).
Oil-soluble petroleum sulfonate, mixed salts	No	(?).
Oil-soluble petroleum sulfonate, sodium salt	No	GLC, WTC.
All other oil-soluble petroleum sulfonate	No	DUP, MON, SOC.
Oleyl acid phosphate	No	FER.
Oxidized hydrocarbon mixture	No	ALX, ELC, FER.
Pentaerythritol esters	No	HCC.
Phenol salts:		
Alkylphenol, calcium salt	No	SOC.
Alkyl phenols	No	(?).
Dodecylphenol, sulfurized, calcium salt	No	SOC, TX.
Nonylphenol, barium salt	No	CCA, FER, WTC.
All other phenol salts	No	TNA.
Phosphorodithioates (dithiophosphates):		
Bis(1,3-dimethylbutyl)phosphorodithioate oleyl amine salt	No	ELC.
All other phosphorodithioates used as lubricating oil and grease additives	No	ELC, (?).
Polysobutanyl succinic anhydride	No	TX.
Succinimides:		
Alkenyl succinimide	No	SOC, TNA, TX, (?).
Dodecyl- <i>n</i> -acetic succinimide	No	SM.
Modified succinimides	No	CXI.
All other succinimides	No	(?).
Sulfur compounds:		
Aliphatic hydrocarbon sulfides	No	ELC, FER, (?).
Di-tertiary nonylpolysulfide	No	PAS.
Trisobutylene polysulfide	No	TX.
All other sulfur compounds	No	CHD, FER, TNA, UPJ, (?).
1,3,4-Thiadiazole, 2,5-bis(dialkylidithio) derivatives	No	ELC.
Tributyl phosphite	No	ALW.
Trimethylol propane ester	No	HCC, QCP, SCP.
Very high molecular weight (>1000) hydrocarbons	No	(?).
Zinc dialkylidithiophosphate	No	ELC, SOC, TNA, TX.
Zinc dialkylphenol dithiophosphate	No	SOC.
Zinc dibutyl phosphorodithioate	No	ELC.
Zinc hydrocarbon dithiophosphate	No	(?).
All other lubricating oil and grease additives,		
cyclic	No	CGY, ENJ, SM, TNA, (?), (?).
All other lubricating oil and grease additives,		
acyclic	No	ALW, DUP, ELC, QCP, SCP, SM, TNA, TX, (?), (?).
Paint driers, naphthenic acid salts:		
Cadmium naphthenate	No	CCA.
Calcium naphthenate	No	MCI, NOD.
Chromium naphthenate	No	MCI.
Cobalt naphthenate	Yes	CCA, MCI, NOD, SHP, TRO.
Copper naphthenate	No	NOD.
Iron naphthenate	No	MCI, NOD.
Lead naphthenate	No	MCI, NOD.
Manganese naphthenate	No	MCI, NOD.
Naphthenate driers, mixed salts	No	MCI.
Rare earths naphthenate	No	NOD.
Zinc naphthenate	No	MCI, NOD, TRO.

See footnotes at end of table.

Table 14-2—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14-3)
Photographic chemicals:	Yes	
N-2-(4-Amino-N-ethyl-m-toluidino)ethyl methane-sulfonamide	No	WAY.
Aryl alkyl polyether alcohol	No	DIX.
5-Chlorobenzotriazole	No	FMT.
4-Diazo-2,5-diethoxymorpholinobenzene	No	ALL.
2,5-Diethoxy-4-morpholinobenzene diazonium chloride	No	ALL.
p-Diethylaminobenzene diazonium chloride (p-Diazo-N,N-diethylaniline zinc chloride)	No	ALL.
p-Dimethylaminobenzene diazonium chloride (p-Diazo-N,N-dimethylaniline zinc chloride)	No	ALL.
p-Diphenylaminodiazonium sulfate	No	ALL.
p-[Ethyl(2-hydroxyethyl)amino]benzene diazonium chloride -diazo-n-hydroxyethylaniline zinc chloride	No	ALL.
(N-Ethyl-N-(2-hydroxyethyl)-3-methyldehydrogen sulfate)p-phenylenediamine	No	(?).
Hydroquinone (Hydroquinol)	No	EKT.
p-Methylaminophenol sulfate (Metol)	No	EK.
2-Methylbenzoxazole	No	DUP.
5-Methyl-1,7-dihydroxy-1,3,4-triazalindolizine	No	FMT.
3-Methyl-N-[2(methylsulfonamidoethyl)-N-ethyl-p-phenylenediamine] sequisulfate monohydrate	No	(?).
4-Methyl-1-phenyl-3-pyrazolidone	No	CWN.
p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	No	ALL.
6-Nitrobenzimidazole	No	FMT.
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, CHD, DUP, FMT, WAY, (?), (?).
Polymers for fibers:	Yes	
Cellulose acetate	No	EKT, MIL.
Copolyurethane urea	No	DUP.
Nylon 6 and 6/6:		
Nylon 6 (polymer for fiber, only)	No	ACS, CNP, (?).
Nylon 6/6	No	DUP, MON.
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	ATR, HCL.
Polymers, water soluble:	Yes	
Acrylamide polymers and co-polymers:		
Acrylamide-2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	No	ENJ, (?).
Acrylamide-acrylic acid copolymer	No	CHP.
Acrylamide-acrylic acid copolymer, sodium salt	No	BKM, (?).
Acrylamide-trimethylaminoethyl acrylate chloride polymer	No	(?).
Acrylamide-trimethylaminoethyl methacrylate chloride	No	(?).
Adipic acid-crosslinked polyacrylamide	No	BKM, ENJ, HCL, SCP, (?), (?).
Polyacrylamide	No	ACY, ENJ, MRK, SQA, (?).
All other polyacrylamide copolymers	No	HCL, (?).
Cellulose esters and ethers:		
Hydroxyethylcellulose	No	AQU, DOW, UCC, UPJ.
Hydroxyethyl hydroxypropyl cellulose	No	(?).
2-Hydroxypropyl cellulose	No	AQU.
Methylcellulose	No	DOW.
Sodium carboxymethylcellulose (100%)	No	AQU, CBC, LCS, MAK.
All other cellulose ethers and esters	No	AQU, DIX, S, (?).

See footnotes at end of table.

Table 14-2—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' identification codes (according to list in table 14-3)
Polymers, water soluble—Continued		
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-)	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).
Polyacrylate methacrylate copolymers	No	BFG, RH, (²).
Polyacrylate poly(hydroxypropylacrylate) copolymer	No	(²).
Polyacrylic acid	No	MYO, (²), (²).
Sodium ammonium polyacrylate and copolymers	No	ALC, BAS, BFG, RH, SCP, (²), (²).
Sodium carboxymethyl amylose	No	CCL.
Sodium carboxymethyl starch	No	(²).
Sodium polyacrylate	No	BKM, DOW, EFH, MYO, SYT.
Sodium polyacrylate, grafted	No	(²).
All other polyacrylic acid salts	No	ENJ, (²), (²), (²).
Polyacrylonitrile, hydrolyzed	No	BKM, DIX(E), GPC, RH.
Polyacrylonitrile, starch hydrolyzed polymer	No	GPC.
Polyamines	No	ENJ, QCP, (²).
Polydextrose	No	PFZ.
Poly(diallyldimethylammonium chloride)	No	CPS, MRK, (²).
Polythyleneimine	No	DAN.
All other polymers, water soluble	No	BKM, DAN, EFH, PRA, RH, RPC, SCP, SYT, (²), (²), (²), (²).
Polymethacrylic acid, sodium salt	No	ALC, CPS.
Poly(1,1'-(methylimino)bis(3-chloro-2-propanol)-tetramethylethylenediamine)	No	BKM.
I-Vinyl-2-pyrrolidinone, copolymers with vinyl		
acetate	No	DAN.
1-Vinyl-2-pyrrolidinone, polymers	No	CCL, DAN, GAF, (²).
Xanthan gum	No	PFZ.
Poly-olefins:		
Poly-olefins	Yes	
Poly- α -olefins	No	CO, SM, SOC.
Poly- α -olefins, sulfurized	No	SM.
Rare sugars:		
l-Arabinose	No	PFN.
D-Galactose	No	PFN.
D-Maltose	No	PFN.
Silicone greases:		
Silicone greases	No	DCC, SPD, SWS.
Tanning materials, synthetic:		
1-Naphthalenesulfonic acid, formaldehyde condensate and salt	No	RH.
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	No	GRD.
1-Phenol-2-sulfonic acid, formaldehyde condensate (Phenol-formaldehyde, sulfonated)	No	BAS, RH.
Polyoxyalkylated cyclic amines	No	ML.
All other tanning materials, synthetic	No	BAS, SCP.
Textile chemicals, other than surface active agents:		
N,N-Bis-(2-hydroxyethyl)octadecanamide	No	CCC.
N,N-Dibenzylhydroxylamine	No	CCC.
Dicyanodiamide formaldehyde ammonium chloride polymer	No	CCC, DAN, S, SYT.
Dimethyloldihydroxyethylene urea	No	ACY, CCC, CHP, DAN, SYT.
Formaldehyde polymer with carbamate esters	No	SYT.

See footnotes at end of table.

Table 14-2—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were reported, identified by manufacturer, 1989

Miscellaneous end-use chemicals and chemical products	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 14-3)
Textile chemicals, other than surface active agents—Continued		
Hydrogenated tallow fatty acid aminoethylethanolamine condensation products	No	CCC.
Lauryl alkyl dimethylamine acetate	No	(2).
Lauryl alkyl dimethylamine phosphate	No	(2).
Melamine formaldehyde methanol polymer	No	ACY, CCC.
Melamine formaldehyde copolymer	No	ENJ.
Melamine stearyl alcohol polymer	No	SYT.
Propoxylated starches	No	SYT.
2,2',4,4'-Tetrahydroxybenzophenone	No	BAS.
Tri(behenoyloxymethyl)trimethoxymethylmelamine	No	SYT.
Urea polymers with formaldehyde and methanol	Yes	ACY, BAS, CCC.
Urea, polymer with tetrakis[hydroxymethyl]phosphonium sulfate	No	CHP.
All other textile chemicals, other than surface active agents	No	BAS, CCC, DUP, ENJ, GAF, PAT, RPC, SCP.
Urea in compounds or mixtures (100% basis):		
Urea in feed compounds (100% basis)	Yes	BNP, CAC, HKY, SOH, TER, TRI, WYC.
Urea in liquid fertilizer (100% basis)	Yes	ARM, BNP, CFI, CHN, CNC, FRI, HKY, MSC, SMP, SOC, SOH, TER, TVA, UOC, WYC, (2).
Urea in plastics (100% basis)	No	OMC, SOH, TRI.
Urea in solid fertilizer (100% basis)	Yes	CAC, CFI, CNC, FRI, GCC, MSC, OMC, SOH, TER, TRI, TVA, UOC, WLC.

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.

³ Data for these companies was adjusted or estimated.

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

Table 14-3

Miscellaneous end-use chemicals and chemical products: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
ACS	Allied Signal, Inc. Engineered Materials Sector	EFH	E.F. Houghton Co.
ACY	American Cyanamid Co.	EK	Eastman Kodak Co.:
AJI	Ajinomoto USA, Inc.	EKT	Tennessee Eastman Co. Div.
ALC	Alco Chemical Corp.	ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.
ALD	Aldrich Chemical Co., Inc.	ENJ	Exxon Chemical Americas
ALL	Alliance Chemical, Inc.	FER	Ferro Corp.:
ALW	Albright & Wilson Americas, Inc.		Bedford Chemical Div.
ALX	Alox Corp.		Kell Chemical Div.
AMO	Amoco 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 Chemical Corp.
ATR	Atlantic Richfield Co., Arco Chemical Co.	GBF	International Bio-Synthetics, Inc.
BAS	BASF Corp.	GCC	Arcadian Corp.
BCK	Beckman Instruments, Inc., Diagnostics System Group	GFS	GFS Chemicals, Inc.
BFG	B. F. Goodrich Co.	GLC	General Latex and Chemical Corp.
BKM	Buckman Laboratories, Inc.	GNR	Genencor, Inc.
BLZ	Belzak Corp.	GPC	Grain Processing Corp.
BNP	Terra International, Inc.	GRD	W. R. Grace & Co., Organic Chemicals Div.
BRD	Lonza, Inc.		Polymers & Chemical Div.
BRS	Bristol-Myers Co.	GRS	Champion Refining Co.
CAC	Cominco Fertilizers, Inc.	GTL	Great Lakes Chemical Corp.
CBC	Carbose Corp.	GYR	Goodyear Tire & Rubber Co.
CCA	Akzo Chemicals, Inc.	HCC	Hatco Chemical Corp.
CCC	C.N.C. International, Inc.	HCL	Hoechst Celanese Corp.:
CCL	Catawba-Charlab, Inc.		Fibers Industrial Div.
CCW	Morton International, Inc., Specialty Chemicals Group		Sou-Tex Works.
CED	Cedar Chemical Co.	HKY	Arcadian Corp.
CFI	CF Industries, Inc.	HMP	W. R. Grace & Co., Organic Chemicals Div.
CGO	Citgo Petroleum, Corp.		Hampshire Chemical Div.
CGY	Ciba-Gelgy Corp.	HPC	Hercules, Inc.
CHD	Chemdesgn, Corp.	JFR	George A. Jeffreys & Co., Inc.
CHH	Chris Hansen's Laboratory, Inc.	LCS	Louisiana Chemical Polymers, Inc.
CHN	Wil-Gro Fertilizer, Inc.	LEM	Napp Chemicals, Inc.
CHP	C. H. Patrick & Co., Inc.	LYP	Lyondell Petrochemical Co.
CHT	Chattem, Inc.	MAK	MAK Chemical Corp.
CNC	Columbia Nitrogen Corp.	MCI	Mooney Chemicals, Inc.
CNP	DSM Chemicals, North America	MCK	MacKenzie Chemical Works, Inc.
CO	Conoco Specialty Products, Inc.	MIL	Milliken & Co., Milliken Chemical Div.
COC	Columbia Organic Chemical Co., Inc.	MLS	Miles Laboratories, Inc., Biotechnology Group.
CPS	CPS Chemical, Co., Inc.	MNA	Monsanto Agricultural Co.
CSP	Coastal Refining & Marketing, Inc.	MOC	Marathon Petroleum Co., Texas Refining Div.
CWN	Upjohn Co., Fine Chemicals	MON	Monsanto Co.
CXI	Chemical Exchange Industries, Inc.	MRK	Merck & Co., Inc.
DA	Diamond Shamrock Refining & Marketing	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. Fibers Dept.	PAH	Parlsh Chemical Co.
		PAR	Pennzoll Co., Penreco Div.

Table 14-3—Continued

Miscellaneous end-use chemicals and chemical products: Directory of manufacturers, alphabetical by code, 1989

<i>Code</i>	<i>Name of company</i>	<i>Code</i>	<i>Name of company</i>
PAS	Atochem North America, Inc.	SPR	Scientific Protein Laboratories
PAT	Pat-Chem, Inc.	SQA	Segua Chemicals, Inc.
PFN	Pfanstiehl Laboratories, Inc.	SUN	Sun Co., Inc.
PFZ	Pfizer, Inc.	SWS	Wacker Silicones, Corp.
PIC	Pierce Chemical Co.	SYT	Synthron, Inc.
PLB	Pharmacla P-L Biochemicals, Inc.	TER	Terra International, Inc.
PMP	PMP Fermentation Products, Inc.	TNA	Ethyl Corp.
PRA	Para-Chem Southern, Inc.	TPC	Texas Petrochemicals Corp.
QCP	Quaker Chemical Corp.	TRD	Bristol Myers Squibb Co.
REG	Regis Chemical Co.	TRI	Triad Chemical
RH	Rohm & Haas Co.	TRO	Troy Chemical Corp.
RPC	Collolds, Inc., Lyndal Div.	TVA	Tennessee Valley Authority, NFDC, TVA, OACD, Div. of Developmental Production
RSA	R.S.A. Corp.	TX	Texaco, Inc., Texaco Chemical Co.
S	Sandoz Chemical Corp., Colors & Chemicals Div.	UCC	Union Carbide Corp., Industrial Chemical Div.
SCP	Henkel Corp.	UOC	Union Oil Co. of California
SHC	Shell Chemical Co.	UPJ	Upjohn Co.
SHP	Shepherd Chemical Co.	UPM	UOP Inc.
SHX	Sherex Chemical Co., Inc.	USR	Uniroyal Chemical Co., Inc.
SM	Mobil Oil Corp., Chemical Product Div. Beaumont Refinery Div.	VLR	Valero Refining & Marketing Co.
SMP	J. R. Simplot Co.	VNC	Vanderbilt Chemical Corp.
SOC	Chevron Corp., Chevron Chemical Co.	WAY	Olin Hunt Specialty Products, Inc.
SOG	Hill Petroleum Company	WLC	Freeport-McMoran Resource Partners
SOH	BP Chemicals America, Inc.	WTC	Witco Chemical Corp.
SPD	General Electric Co., Silicone Products Div.	WYC	Coastal Chem, Inc.

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 15-1 shows the trend of production of miscellaneous chemicals during 1985–89, and shows that after a steady rate of increase after 1985, production in 1989 was less than in the previous year.

U.S. production of miscellaneous cyclic and acyclic chemicals in 1989 amounted to 48.9 billion kilograms, an increase of 1.7 percent compared with production in 1988 (Table 15-1). Production of miscellaneous acyclic chemicals comprised 96.7 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 1989, sales of miscellaneous chemicals were 20.2 billion kilograms, valued at \$16.3 billion, compared with 19.1 billion kilograms, valued at \$15.1 billion, in 1988. The increase in sales quantity in 1989 was 5.3 percent. However, indicating that the surge in prices of the two previous years was almost at an end, the unit value of sales in 1989, 80.7 cents per kilogram, was little changed from the previous year's 78.9 cents per kilogram.

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, was 28.8 billion kilograms in 1989, a marginal increase over the 28.3 billion kilograms produced in 1988.

With a 29 percent greater production volume than monohydric and polyhydric alcohols combined, halogenated hydrocarbons is the leading individual group. Production of halogenated hydrocarbons was about 13.3 million kilograms in 1989, about 0.4 million kilograms more than in 1988. Production of chlorinated hydrocarbons, by far the largest segment of this group, was 12.7 billion kilograms in 1989, compared with 12.2 billion kilograms in 1988. The very minor change in production for this entire group in 1988–89 hides increased production of some of its constituent chemicals: chloroform (up 12 percent), vinyl chloride (up 12 percent), and 1,1,1-trichloroethane (up 8 percent). Fluorinated hydrocarbons production, 592 million kilograms in 1989, was 5 percent less than in 1988, following an increase of 18 percent in the earlier year.

Production of the second largest individual group of miscellaneous acyclic chemicals—monohydric alcohols—decreased 11 percent in 1989, to 6.7 billion kilograms, following two years of significant growth. The decrease was spread evenly among most of the major alcohols.

Virtually in a tie for third place among miscellaneous acyclic chemicals, each with production close to 4.2 billion kilograms in 1989, are nitrogenous compounds, acids/anhydrides and aldehydes. Their production was almost the same in 1988.

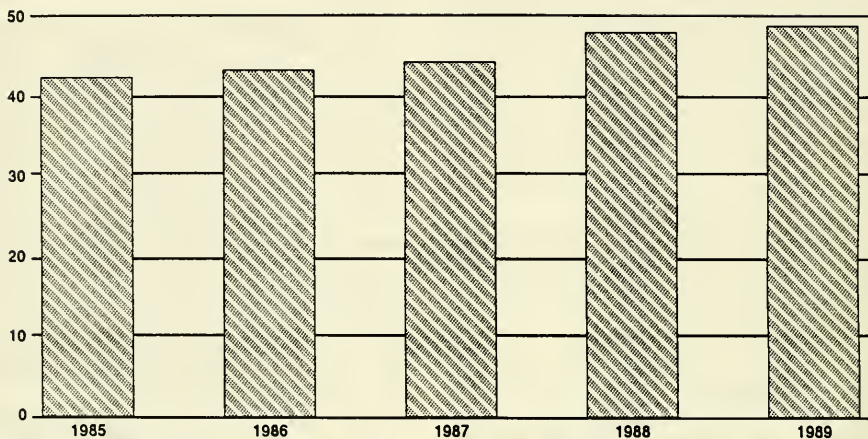
Table 15-2 lists the products in this section individually identified by manufacturer(s) codes. Table 15-3 lists those codes alphabetically and identifies the manufacturer by name.

Aimison Jonnard
202-252-1350

(Effective 1/14/91 202-205-3350)

Figure 15-1
Miscellaneous cyclic and acyclic chemicals: U.S. production, 1985-89

*Billions
of kilograms*



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

Table 16-1

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1989

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Grand total	48,871,030	20,166,509	16,269,608	\$0.81
Cyclic				
Total	1,567,895	735,100	1,467,990	2.00
Benzolic acid esters	2,338	1,685	3,342	1.98
Benzolic acid salts	(²)	12,930	19,741	1.53
Benzoyl peroxide	4,354	3,161	16,831	5.32
Caprolactam	592,987	(²)	(²)	(²)
Hexamethylenetetramine, tech	44,396	(²)	(²)	(²)
Lactones	66,008	6,883	16,697	2.43
Maleic anhydride	215,515	169,856	166,369	.98
Morpholine	11,678	13,746	23,846	1.73
Pinene and derivatives, total	137,340	22,514	27,815	1.24
β-Pinene	16,756	1,674	2,310	1.38
Pine oil, natural, sulfate	2,287	(²)	(²)	(²)
All other pinene and derivatives	118,297	(²)	(²)	(²)
Succinic anhydride derivatives	7,863	7,177	16,043	2.24
Tall oil salts (Linoleic-rosin acid salts)	716	(²)	(²)	(²)
All other miscellaneous cyclic chemicals	484,700	497,148	1,177,306	2.37
Acyclic				
Total	47,235,675	19,368,214	14,779,191	.76
Nitrogenous compounds				
Total	4,155,655	1,412,658	1,640,517	1.16
Amides, total				
	143,162	73,878	132,013	1.79
Erucamide	3,783	(²)	(²)	(²)
N,N'-Ethylenebis-oleamide	234	256	765	2.99
N,N'-Ethylenebis-stearamide	21,783	16,063	23,709	1.48
Oleamide (Octadecene amide)	1,856	1,569	4,123	2.63
All other amides	115,506	55,990	103,416	1.85
Amines, total³				
	877,229	278,605	414,299	1.49
Butylamines, total				
	13,855	11,423	22,262	1.95
n-Butylamines	(²)	1,254	2,396	1.91
DI-n-Butylamine	(²)	2,670	4,539	1.70
All other butylamines	13,855	7,499	15,327	2.04
Diethylamine	(²)	2,292	4,070	1.78
Dimethylaminopropylamine	3,076	3,459	7,555	2.18

See footnotes at end of table.

Table 15-1—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1989

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Acyclic—Continued				
Nitrogenous compounds—Continued				
Amines—Continued				
Ethylenediamine	34,241	24,149	45,416	\$1.88
Isopropylamine, mono-	(²)	28,474	24,465	.86
Dimethylamine	46,781	39,518	32,757	.83
Triethylamine	(²)	7,922	14,544	1.84
Trimethylamine	23,421	17,282	12,877	.75
All other amines	755,855	144,086	250,353	1.74
Ethanolamines, total	302,566	234,808	282,832	1.21
2,2'-Aminodethanol (Diethanolamine)	91,896	79,131	91,626	1.16
2-Aminoethanol (Monoethanolamine)	107,339	67,691	74,340	1.10
2,2',2''-Nitrioltriethanol (Triethanolamine)	93,066	81,016	95,903	1.18
Methyldiethanolamine	10,265	6,970	20,963	3.01
Nitriles, total	2,272,076	708,695	550,668	.78
Acetonitrile	18,943	(²)	(²)	(²)
Acrylonitrile	1,071,519	606,821	455,180	.75
2-Methylacetonitrile (Acetone cyanohydrin)	582,907	(²)	(²)	(²)
All other nitriles	598,707	101,874	95,488	.93
All other nitrogenous compounds	560,622	116,672	260,705	2.23
Acids, acyl halides and anhydrides				
Total	4,213,399	1,111,076	1,054,736	.95
Acetic acid, synthetic, 100%	1,493,971	358,763	137,830	.38
Acrylic acid ⁴	472,642	103,642	120,272	1.16
Dimer acid (C ₃₆ dibasic acid)	18,407	14,236	15,481	1.09
Fatty acids, hydrogenated ⁴	156,128	130,614	89,699	.69
Fumaric acid	(²)	12,936	17,481	1.35
Pivaloyl chloride	3,842	(²)	(²)	(²)
All other acids, acyl halides and anhydrides	2,068,409	490,885	673,973	1.37
Salts of organic acids				
Total	189,710	163,545	267,492	1.64
Acetic acid salts, total	24,221	10,258	17,409	1.70
Potassium acetate	1,843	(²)	(²)	(²)
Sodium acetate	20,036	(²)	(²)	(²)
Zinc acetate	(²)	127	435	3.42
All other acetic acid salts	2,342	10,131	16,974	1.68
2-Ethylhexanoic acid (α-Ethylcaproic acid) salts, total	9,837	8,718	24,389	2.80
Calcium 2-ethylhexanoate	1,218	1,139	2,003	1.76
Cobalt 2-ethylhexanoate	1,957	1,632	6,421	3.94
Manganese 2-ethylhexanoate	644	640	1,358	2.12
Zinc 2-ethylhexanoate	581	346	964	2.79
Zirconium 2-ethylhexanoate	1,765	1,361	5,404	3.97
All other 2-ethylhexanoic acid salts	3,672	3,600	8,239	2.29

See footnotes at end of table.

Table 15-1—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1989

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Acyclic—Continued				
Salts of organic acids—Continued				
Formic acid salts	8,237	(²)	(²)	(²)
Lauric acid salts	(²)	657	3,449	\$5.25
Neodecanoic acid, calcium salt	22	26	55	2.12
Potassium oxalate	15	14	91	2.12
Propionic acid salts, total	(²)	19,102	16,129	.84
Calcium propionate	11,761	11,704	7,853	.67
All other propionic acid salts	(²)	7,398	8,276	1.12
Stearic acid salts, total	72,781	67,206	103,562	1.54
Aluminum stearates, total ⁶	2,331	2,153	6,084	2.82
Aluminum tristearate	827	811	2,652	3.27
All other aluminum stearate salts	1,504	1,342	3,412	2.54
Barium stearate	1,280	288	625	2.17
Calcium stearate	42,594	41,317	51,408	1.24
Magnesium stearate	9,441	7,452	13,620	1.83
Zinc stearate	15,471	14,708	27,780	1.89
All other stearic acid salts	1,664	1,288	4,085	3.16
All other salts of organic acids	62,836	57,564	102,408	1.78
Aldehydes				
Total	4,062,273	1,472,908	310,058	.21
n-Butyraldehyde	763,572	(²)	(²)	(²)
Formaldehyde (37% by weight)	2,673,233	1,305,488	173,426	.16
All other aldehydes	625,468	167,420	136,632	.82
Ketones				
Total	1,486,984	1,059,680	570,449	.51
Acetone	1,145,022	711,140	294,472	.41
Diacetone alcohol (Hydroxymethyl pentanone)	(²)	9,851	10,535	1.07
Methyl ethyl ketone (2-Butanone)	204,157	226,261	138,570	.61
4-Methyl-2-pentanone (Methyl isobutyl ketone)	77,494	75,633	64,813	.86
All other ketones	60,311	36,795	62,059	1.69
Alcohols, monohydric, unsubstituted				
Total	6,681,833	3,961,655	1,502,725	.38
Alcohols, C₁₁ or lower, unmixed, total				
Butyl alcohols, total	(²)	318,125	188,828	.59
n-Butyl alcohol (n-Propylcarbinol)	794,100	260,716	147,693	.57
Isobutyl alcohol (Isopropylcarbinol)*	61,443	49,535	31,101	.63
All other butyl alcohols	(²)	7,874	10,034	1.27
Ethyl alcohol, synthetic ⁷	248,906	(²)	(²)	(²)
2-Ethyl-1-hexanol	277,825	171,118	106,174	.62
Isopropyl alcohol	668,518	539,427	235,659	.44

See footnotes at end of table.

Table 15-1—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1989

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Acyclic—Continued				
Alcohols, monohydric, unsubstituted—Continued				
Methanol, synthetic	3,704,475	2,238,583	326,720	\$.15
Propyl alcohol (Propanol)	82,634	49,373	39,897	.81
All other alcohols, C ₁₁ or lower, unmixed	430,669	391,229	270,743	.69
Alcohols, C ₁₂ and higher, unmixed, total	93,670	43,805	66,154	1.51
1-Octadecanol (Stearyl alcohol)	(²)	11,851	20,261	1.71
All other alcohols, C ₁₂ and higher, unmixed	(²)	31,954	45,893	1.43
Mixtures of alcohols, total	319,592	209,995	268,550	1.28
Containing C ₁₁ and lower	32,950	43,951	48,527	1.10
Containing C ₁₂ and higher ^a	286,642	166,044	220,023	1.33
Esters of monohydric alcohols				
Total	2,833,482	1,405,324	1,373,753	.98
n-Butyl acetate	101,633	86,374	56,020	.76
Isobutyl acetate	37,303	24,439	16,641	.68
Butyl acrylate	240,256	92,414	115,263	1.25
Dilauryl-3,3'-thiodipropionate	1,073	1,075	4,042	3.76
Distearyl-3,3'-thiodipropionate	2,399	2,405	9,146	3.80
Ethyl acetate (100% basis)	132,346	94,673	60,689	.64
2-Ethylhexyl acrylate	45,293	32,783	48,323	1.47
2-Ethylhexyl chloroformate	2,833	2,391	4,713	1.97
Fatty acid esters, not included with plasticizers or surface-active agents, total	9,470	5,179	8,227	1.59
Methyl esters of tallow	825	717	504	.70
Myristyl myristate	(²)	106	643	6.06
All other fatty acid esters not included with plasticizers or surface-active agents	8,645	4,356	7,080	1.63
Isopropyl acetate	18,144	16,837	15,594	.93
Methyl methacrylate	526,610	(²)	(²)	(²)
Phosphorus acid esters, not elsewhere specified	62,638	50,613	120,034	2.37
Propyl acetate	34,399	28,797	28,958	1.01
Stearyl methacrylate	(²)	134	546	4.07
Vinyl acetate	1,157,802	589,092	473,259	.74
All other esters of monohydric alcohols	461,283	328,118	412,298	1.26
Polyhydric alcohols^a				
Total	3,655,849	2,923,572	2,722,879	.93
1,4-Butanediol	182,425	(²)	(²)	(²)
Ethylene glycol	2,477,135	2,257,087	1,983,438	.88
Pentaerythritol	47,968	51,848	70,242	1.35
Propylene glycol	365,300	290,796	251,006	.86
Sorbitol (70%)	150,651	113,496	94,556	.83
All other polyhydric alcohols	432,370	210,345	323,637	1.54
Polyhydric alcohol esters				
2-Butoxyethyl acetate	7,234	6,832	10,470	1.53
All other polyhydric alcohol esters	115,691	124,476	165,844	1.33

See footnotes at end of table.

Table 15-1—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1989

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Acyclic—Continued				
Polyhydric alcohol ethers				
Total	1,087,281	930,105	1,027,465	\$1.10
2-Butoxyethanol (Ethylene glycol monobutyl ether) .	164,198	144,810	137,235	.95
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	42,471	36,158	42,642	1.18
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	6,215	(²)	(²)	(²)
Diethylene glycol	197,303	158,024	109,030	.69
2-Ethoxyethanol (Ethylene glycol ethyl ether)	46,326	28,622	36,763	1.28
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	14,887	16,660	17,978	1.08
2-Methoxyethanol (Ethylene glycol methyl ether)	30,934	16,148	16,977	1.05
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	19,323	29,193	33,387	1.14
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	14,137	(²)	(²)	(²)
Polyglycols, ethylene glycol and glycol ether, mixed .	(²)	23,755	39,563	1.67
Polytetramethylene glycol ether	(²)	28,039	90,515	3.23
Triethylene glycol	50,697	48,354	64,315	1.33
Glycol ethers derived from propylene oxide, total ...	46,725	35,930	37,456	1.04
Dipropylene glycol	(²)	28,113	26,745	.95
All other glycol ethers derived from propylene oxide	(²)	7,817	10,711	1.37
All other polyhydric alcohols ethers	454,065	364,412	401,604	1.10
Brominated, chlorinated, and fluorinated hydrocarbons				
Total	13,315,582	3,697,361	2,651,813	.71
Brominated (including bromochlorinated) hydrocarbons, total				
6,575	4,024	17,304	4.30	
1-Bromobutane	(²)	241	590	2.45
All other brominated hydrocarbons	(²)	3,783	16,714	4.42
Chlorinated hydrocarbons, total	12,717,079	3,229,848	1,622,423	.50
Chlorinated paraffins (C₁₀–C₃₀), total				
29,136	28,742	33,117	1.15	
35%–64% chlorine	23,316	22,695	22,789	1.00
65% or more chlorine	5,820	6,047	10,328	1.71
Chloroform	266,534	229,311	102,223	.45
Chloromethane (Methyl chloride) ⁴	208,906	93,761	38,775	.41
Dichloromethane (Methylene chloride)	218,468	140,857	66,777	.47
Ethyl chloride (Chloroethane) ⁴	73,347	(²)	(²)	(²)
Ethylene dichloride (1,2-Dichloroethane) ⁴	6,070,377	667,052	157,898	.24
Tetrachloroethylene (Perchloroethylene)	218,286	197,147	97,220	.49
1,1,1-Trichloroethane (Methyl chloroform)	355,315	303,174	186,522	.62
Vinyl chloride, monomer (Chloroethylene) ⁴	4,597,104	1,181,140	764,707	.66
All other chlorinated hydrocarbons	679,606	388,664	175,184	.45

See footnotes at end of table.

Table 15-1—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1989

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value ¹
		Quantity	Value	
	1,000 kilograms	1,000 kilograms	1,000 dollars	Per kilogram
Acyclic—Continued				
Brominated, chlorinated, and fluorinated hydrocarbons—Continued				
Fluorinated (including other fluorohalogenated) hydrocarbons, total				
	591,928	463,488	1,012,087	\$2.18
Chlorodifluoromethane (F-22)	155,366	108,667	265,547	2.44
Dichlorodifluoromethane (F-12)	177,606	179,961	342,282	1.90
Trichlorofluoromethane (F-11)	87,335	86,233	139,910	1.62
All other fluorinated (including other fluorohalogenated) hydrocarbons	171,621	88,627	264,348	2.98
All other miscellaneous acyclic chemicals				
Total	5,430,702	1,099,022	1,480,990	1.35
Acyclic peroxides, total				
	32,143	30,975	105,401	3.40
2-Butanone peroxide (MEK peroxide)	7,428	7,608	22,460	2.95
tert-Butyl peroxyvalate	2,742	2,389	9,805	4.10
Di-tert-butyl peroxide (tert-Butyl peroxide)	(²)	1,505	5,135	3.41
All other acyclic peroxides	21,973	19,473	68,001	3.49
Expoxides, ethers and acetals, total				
	4,664,738	880,373	721,990	.82
Ethylene oxide ⁴	2,281,986	207,835	269,958	1.30
Glycidyl ethers	2,160	2,320	9,089	3.92
All other expoxides, ethers and acetals	2,380,592	670,218	442,943	.66
Fats and oils, chemically modified¹⁰				
	12,724	14,197	17,158	1.21
Organo-aluminum compounds	49,801	16,654	74,740	4.49
Organo-magnesium compounds	86	80	2,644	33.13
Hexamethyldisilazane	424	406	3,869	9.53
Organo-tin compounds	(²)	12,394	76,759	6.19
Silicone fluids	64,055	41,432	172,913	4.17
Phosgene (Carbonyl chloride)	274,633	(²)	(²)	(²)
All other miscellaneous acyclic chemicals, all other	332,098	102,511	305,516	2.98
Mixtures not specifically itemized				
Total	67,460	63,195	22,427	.35
Fatty acid residues	12,107	11,809	1,974	.17
All other mixtures not specifically itemized ¹¹	55,353	51,386	20,453	.40

¹ Calculated from unrounded figures.² Reported data are accepted in confidence and may not be published, or no data were reported.³ Statistics limited to compounds of carbon, hydrogen, and nitrogen; and exclude production and sales of fatty amines. Statistics on fatty amines are included in the section on "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)*, 1989, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.⁵ Excludes minor amounts reported as "fatty acids" and "partially hydrogenated".⁶ Statistics exclude production and sales of potassium and sodium stearates. Statistics on these stearates are included in the section on "Surface-Active Agents."⁷ 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.⁸ Includes small amount of mixtures of alcohols on both sides of the C₁₁-C₁₂ dividing line.⁹ Some polyols which are used as intermediates for urethanes have been included in the section on "Plastics and Resin Materials."¹⁰ Other than esters, salts, alcohols, acids, or acyl halides, which are tabulated in preceding groups.¹¹ 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 15-2

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Cyclic	Yes	
6-Acetoxy-2,4-dimethyl-1,3-dioxane	No	GIV.
Alkylphenol formaldehyde condensate, alkoxylated	No	(?)
Alkylphenol formaldehyde copolymer	No	(?)
1-(2-Aminoethyl)piperazine	No	DOW.
1-(3-Aminopropyl)morpholine	No	TX.
Amyl ortho- and para-dimethylaminobenzoate	No	VND.
Benzenephosphinic acid	No	FER.
Benzoic acid esters:	Yes	
Benzoic acid, 2-butoxyethanol ester	No	PCI.
Benzoic acid, butyl ester (Butyl benzoate)	No	MRF, PCI, UTC.
Benzoic acid, C ₁₂ -C ₁₆ ester	No	FTX.
Benzoic acid, isodecyl ester	No	VEL.
2-Butoxyethyl benzoate	No	TCC.
2-Ethylhexyl benzoate	No	BRI.
Resorcinol monobenzoate	No	EKT.
Sucrose benzoate	No	VEL.
All other benzoic acid esters	No	CHD.
Benzoic acid salts:	Yes	
Ammonium benzoate	No	WTK.
Barium benzoate	No	FER.
Cadmium benzoate	No	VNC.
Potassium benzoate	No	KLM, PFZ.
Sodium benzoate	No	JRC, KLM, PFZ, RCN.
All other benzoic acid salts	No	VND.
Benztotriazole, polychlorinated	No	EK.
Benztotriazole, potassium & sodium salts	No	(?)
Benztotriazole, substituted	No	CGY.
Benzoyl peroxide	Yes	AZT, CAD, NOC, RCN.
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(α,α-dimethylbenzyl)peroxide	No	RCN.
2,2-Bis(ferrocenyl)propane	No	(?)
Bis(hydroxymethyl)oleyl oxazoline	No	ANG.
2,2-Bis(4-hydroxyphenyl)4-methylpentane	No	ASL.
Bis(perfluoroalkyl)bis(alpha-monochlorohydryl)-pyromellitate	No	HCL.
Bis(triphenylsilyl)chromate	No	(?)
Boron fluoride-phenol complex	No	WTC.
β-Bromo-β-nitrostyrene	No	GIV.
2 (and 3)-tert-Butyl-4-methoxyphenol (Butylated hydroxyanisole, or, BHA)	No	EKT, UPM.
Butylmorpholine	No	TX.
tert-Butyl peroxybenzoate	No	AZT, FRE, NOC, RCN.
tert-Butylphenyl glycidyl ether	No	REZ.
Camphene	No	SCM.
Campholenic aldehyde	No	SCM, VIK.
Caprolactam (2-Oxohexamethylenimine)	Yes	ACS, BAS, CNP.
Caprolactam magnesium bromide	No	(?)
Cellulose acetate hexahydrophthalate	No	(?)
Cellulose acetate phthalate	No	EK.
Chlorothalaxanthone	No	PSG.
Cinnamonnitrile	No	TNA.
Cresolsulfonic acid, formaldehyde condensate	No	HCL.
Cumene hydroperoxide	No	BTL, FRE.
α-Cumyl peroxyneodecanoate	No	RCN, WTC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Cyclic—Continued		
Cyanuric acid	No	MON.
Cyclic silizane	No	SCM.
Cyclohexane carbonitrile	No	DUP.
Cyclohexane dimethanol glycidyl ether	No	REZ.
Cyclohexanethiol	No	PAS.
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl, C ₂₁ H ₃₆ O ₄	No	WVA.
1,4-Cyclohexylenedimethanol	No	EKT.
Cyclohexyl methacrylate	No	CPS.
Decabromodiphenyl ether (DBDP)	No	GTL, TNA.
4,4-Diaminodiphenyl ether	No	MAL.
1,8-Diazabicyclo (5.4.0)undecane	No	AIP.
1,4-Diazobicyclo (2.2.2)octane	No	(?).
2,5-Di(benzoyl peroxy)-2,5-dimethylhexane	No	AZT, RCN.
Dibenzoyl tartaric acid	No	CWN.
2,6-Di-tert-butyl-p-cresol (BHT, or, Butylated hydroxytoluene)	No	UCC, USR.
Di-t-butyl diperoxyphthalate	No	RCN.
2,5-Di-tert-butylhydroquinone	No	EKT.
1,1-Di(t-butyl peroxy) cyclohexane	No	RCN.
1,1-Di(t-butyl peroxy)-3,3,5-trimethyl cyclohexane	No	RCN.
2,4-Di-t-butyl phenyl 3,5-di-t-butyl hydroxybenzoate	No	FER.
1,3-Dichloro-5,5-dimethylhydantoin	No	BRD.
Dicumyl peroxide	No	FRE.
Dicyclopentadienylchromium (Chromocene)	No	(?).
3-Diethylamino-6-methyl-7-(2,4-dimethylanilino)fluoran	No	ESA.
N,N'-Diethyl-N,N'-diphenylurea	No	VCM.
Di(2-ethylhexyl)chloroendate	No	VEL.
o,o-Diethyl-o-phenyl phosphorothioate	No	ICI.
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	RCN.
Diisopropylbenzene hydroperoxide	No	HPC.
p-Dimethoxybenzene (Dimethyl ether of hydroquinone)	No	ASL.
Dimethyl-1,4-cyclohexane dicarboxylate	No	EKT.
4,4-Dimethyl oxazolidone	No	ANG, EFH.
N,N-Dimethylphenyl urea	No	AC.
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.
Diphenyl-t-butylhexyl phosphite	No	WTC.
Diphenylisodecyl phosphite	No	WTC.
Diphenylisooctyl phosphite	No	WTC.
Dipropylene glycol salicylate	No	SBC.
4-(Dodecyloxy)-2-hydroxybenzophenone	No	EKT.
Dodecyl pyridinium chloride	No	TLC.
6-Ethoxy-12-dihydro-2,2,4-trimethyl quinoline	No	MON.
5-Ethyl-1-aza-3,7-dioxabicyclo[3.3.0]octane	No	ANG.
Ethyl-2-cyano-3,3-diphenyl acrylate	No	BAS.
Ethyl cyclohexylamine	No	PLC.
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.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Cyclic—Continued		
Ethyl hydroxymethyl oleyl oxazoline	No	ANG.
Ethylidene norbornene	No	UCC.
4-Ethylmorpholine	No	TX.
o-Ethylphenol	No	ASL.
N-Ethyl pyrrolidone	No	GAF.
Furan derivatives:		
2-Furaldehyde (Furfural)	No	QKO.
Furfuryl amine	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.
Glyceryl p-aminobenzoate	No	VND.
Hexabromocyclododecane	No	TNA.
Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine	No	ANG.
Hexamethylenetetramine, tech	Yes	BOR, HMP, PLS, WCL.
Homomenthol salicylate	No	WTC.
Hydrindantin	No	PIC.
Hydroquinone, di(β-hydroxyethyl) ether	No	EKT.
Hydroquinonesulfonic acid, potassium salt	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	SCP.
2-Hydroxy-4-methoxybenzophenone	No	BRD, VND.
Hydroxymethyl-5,5-hydantoin	No	BRD.
1-Hydroxy-6-octadecyloxy-2-naphthalene carboxylic acid	No	(?).
2-Hydroxy-4-n-octoxybenzophenone	No	BAS.
α-D-p-Hydroxyphenylglycine methyl ester K	No	BOC.
1,2,3-Indantrione monohydrate (Ninhydrin)	No	PIC.
Lactones:		
Butyrolactone	No	BAS, GAF.
Caprolactone	No	UCC.
Diketene	No	EKT.
Lead/iron resorcyate salicylate	No	SHP.
Maleic anhydride	Yes	AMO, ART, ASH, DKA, MON.
Methoxyethyl morpholine	No	TX.
4-Methoxyphenol	No	ASL, EKT.
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.
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).
Methyl thio pinacolone oxime	No	CED.
Morpholine	Yes	AIP, BAS, DOW, TX.
Morpholine salt of gluconic acid	No	(?).
Morpholine salt of p-toluene sulfonic acid	No	AMB.
1,2-Naphthoquinone-2-diazide-5-sulfonyl chloride (215-sulfonyl chloride)	No	ASL.
4-(2-Nitrobutyl) morpholine	No	ANG.
N-Nitrosophenyhydroxyamine salt	No	MAL.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Cyclic—Continued		
Nonylphenol, alkoxylated/aminated	No	TX.
Nonylphenol glycidyl ether	No	REZ.
Octabromodiphenyl oxide	No	TNA.
Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propanoate	No	CGY, TNA.
Octylmethoxy cinnamate	No	TMH.
Phenethyl bromide	No	WCC.
Phenol-sulfonated formaldehyde rosin	No	HCL.
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	No	SCP, UCC.
Phenyl acid phosphate	No	ALW.
Phenylbisododecyl phosphite	No	WTC.
α -D-Phenylglycine methyl ester K	No	BOC.
1-Phenyl-2-hydroxy-2-methyl-propanone-1	No	CWN.
Phenylpropanolamine	No	ORT.
Phenyl xylyl ethane	No	HCC.
Phosphonate ester, cyclic	No	ALW.
Phthalic acid, lead salt, (Dibasic)	No	ALI.
Picramic acid, sodium salt	No	SDC.
Pinene and derivatives:	Yes	
Pinene	No	SCM.
Pinene hydroperoxide	No	SCM.
2-Pinanol (cis and trans)	No	SCM.
α -Pinene	No	ARZ, SCM.
β -Pinene	Yes	ARZ, NCI, SCM.
α -Pinene oxide	No	SCM, 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.
Polyglycols-toluene dithiocyanate 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-icosene	No	GAF.
p-Quinone	No	EKT.
Resorcinol diglycidyl ether	No	REZ.
Rosin acid salts	No	GP.
Salicylic acid, ammonium salt	No	WTK.
Salicylic acid magnesium salt	No	KLM, WTK.
3-Sodiosulfobenzoic acid	No	EKT.
Stannous dioctyl phthalate (Dioctyl tin phthalate)	No	(²).
Styrene oxide	No	UCC.
Succinic anhydride	No	BCC, MIL.
Succinic anhydride derivatives:	Yes	
Dodecylsuccinic anhydride	No	BCC, DIX, HMY.
Dodecylsuccinic anhydride	No	MIL.
Iso-Hexadecenyl succinic anhydride	No	DIX.
Iso-octadecenylsuccinic anhydride	No	DIX, HMY.
Nonenylsuccinic anhydride	No	HMY.
Octadecenyl succinic anhydride	No	HMY.
Octenylsuccinic anhydride	No	DIX, HMY, MIL.
All other succinic anhydride derivatives	No	HMY.
Tall oil acyl chloride	No	CCC, WVA.
Tall oil, chemically modified	No	FOC, WVA, (²), (²).
Tall oil fatty acids, polymerized	No	SHX, 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.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Cyclic—Continued		
Tall oil salts (linoleic-rosin acid salts)—Continued		
Cobalt manganese tallate	No	MCI, SHP.
Cobalt tallate	No	MCI, SHP.
Lead tallate	No	MCI.
Manganese tallate	No	MCI, SHP.
Zinc tallate	No	MCI.
All other tall oil salts (Linoleic-rosin acid salts)	No	CCA, (2).
Tannic acid, N.F.	No	MAL.
Terpene hydrocarbons, monocyclic (Solvenol)	No	HPC, NCI, SCM.
Tetrabromobisphenol A	No	GTL, TNA.
2-tetradecylcyclohexyl aniline	No	EKT.
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-hydroxyhydrocinamate)methane]	No	CGY.
4,4-Thiobis(6-tert-butyl-o-cresol)	No	TNA.
Thiodiethylene bis(3,5-di-tert-butyl-4-hydroxyhydrocinamate)	No	CGY.
Thiophene	No	PAS.
Tolyltriazole, potassium salt	No	(2).
1,3,5-Triazine-(1,3,5(2H,4H,6H))—triethanol	No	(2).
3,4,4'-Trichlorocarbaniide	No	MON.
Trichloromelamine	No	GF5.
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)	No	MON, OMC.
Tri(2,4-ditertiarybutylphenyl) phosphite	No	WTC.
1,3,5-Trisopropyl benzene	No	EKT.
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	ENJ, UCC.
Triphenyl phosphite	No	WTC.
Tris(3,5-di-tert-butyl-y-hydroxybenzyl)isocyanurate	No	CGY.
Urea toluenesulfonate	No	NES.
1-Vinyl-2-pyrrolidone—other copolymers	No	GAF.
1-Vinyl-2-pyrrolidone-methylacrylic acid, dimethylamine ethyl ester, copolymer	No	GAF.
1-Vinyl-2-pyrrolidone, monomer	No	GAF.
1-Vinyl-2-pyrrolidone—vinyl acetate copolymer	No	GAF.
All other cyclic chemicals	No	ALW, ASL, BAS, CGY, CHD, CWN, DPW, EK, EK, EK, HCL, KCH, MIL, MNA, PAC, PIC, RCN, REG, REZ, RH, RQT, RSA, S, SCM, SCP, SHP, TNA, UCC, VIK, WAY, WTC, (2), (2), (2), (2), (2), (2).
Acyclic:	Yes	
Nitrogenous compounds:		
Acetaldehyde dimethylhydrazone	No	DIX.
Acetamidoethanol (N-Acetyl-ethanolamine)	No	SBC.
Amides:		
Acetamide	No	WTK.
Acrylamide monomer	No	ACY, BFG, (2).
Acrylamide polymer with N,N-Diethyl-N-methyl-2[[1-oxo-2-propenyloxy]]ethaniminium sulfate	No	(2).
Amidoamines	No	PAC.
1,1'-Azobisformamide	No	USR.
Behenamide	No	ASL, WTC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amides—Continued		
Bis[2-(octadecylamido)ethyl]-N-(2-cyanoethyl)-N-ethyl ammonium ethyl sulfate	No	SBC.
Chloromethylene dimethyliminium (Amide chloride)	No	CWN.
Coconut oil amide	No	ARC, CAD, FER.
2,2-Dibromo-3-nitropropioamide	No	DOW.
N,N-Diethyldodecanamide	No	EK.
N,N-Dimethylacetamide	No	DUP, MON.
N,N-Dimethylacetacetamide	No	BRD, EKT.
Dimethylaminopropyl methacrylamide	No	TX.
N,N-Dimethylformamide	No	AIP, DUP.
Erucamide	Yes	ARC, SYP, WTC.
Erucyl stearamide	No	WTC.
N-N-Ethylenebisocooamide	No	WTC.
N,N'-Ethylenebis-oleamide (Oleic acid-ethylenediamine condensate (Amine/acid ratio = 1/2))	Yes	BRD, CCW, WTC.
N,N'-Ethylenebis(stearamide)	Yes	BRD, CCW, WTC.
N-(Hydroxymethyl)-formamide	No	(²).
Methacrylamide	No	BFG, DUP.
N-Methylacetamide	No	ARS.
Monomethylacetacetamide	No	EKT.
Oleamide (Octadecene amide)	Yes	ARC, SYP, WTC.
Oleoylpalmitamide	No	HXL, WTC.
Oxamide	No	HML, (²).
Stearamide (Octadecane amide)	No	SYP, WTC.
Stearylerucamide	No	HXL, WTC.
Stearyl stearamide	No	WTC.
Tallow amide, hydrogenated	No	ARC, CAD.
All other amides	No	ARC, ARS, FER, MIL, REG.
Amines:	Yes	
t-Alkylamines, primary, mixed	No	RH.
Alkylamines:		
Allylamine	No	HCL.
Diallylamine	No	HCL.
Triallylamine	No	HCL.
N,N'-Bis(2-amino-2-methyl)propyl-1,2-ethane diamine	No	HXL
Bis-hexamethylenetriamine amine	No	DUP, MON.
Butylamines:	Yes	
n-Butylamine, mono	Yes	AIP, HCL, PAS.
sec-Butylamine, mono	No	FER, PAS.
tert-Butylamine, mono	No	MON, SC.
Di-n-butylamine	Yes	AIP, HCL, PAS.
Dilsobutylamine	No	AIP, HCL.
Tri-n-butylamine	No	AIP, HCL, PAS.
n-Butylethylamine	No	AIP.
Di-tert-butylethyldiamine	No	DOW, HCL.
Diethylenetriamine	No	TX, UCC.
Di-2-ethylhexylamine	No	HCL.
Dilsopropylamine	No	AIP, PAS, UCC.
2,2-Dimethyl-N-(2-aminoethyl)-1,2-ethane diamine	No	HXL.
Dimethylaminopropylamine	No	AIP, BAS, TX.
3-Dimethylaminopropylamine	No	HCL.
N,N-Dimethylbutylamine	No	HCL.
Ethylamines:		
Diethylamine	Yes	AIP, HCL, PAS, UCC.
Ethylamine, mono-	No	AIP, HCL, PAS, UCC.
Triethylamine	Yes	AIP, HCL, PAS, UCC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amines—Continued		
Ethylenediamine	Yes	DOW, TX, UCC.
(2-Ethylhexyl)amine, mono-	No	HCL, 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, BAS, DUP, IMC, QTR, UCC.
Methylamine, mono-	No	AIP, DUP, IMC, QTR.
Trimethylamine	Yes	AIP, DUP, IMC, QTR.
3-Methylaminopropylamine	No	BAS.
tert-Octylamine	No	RH.
n-Octylamine, mono	No	HCL.
Pentaethylenehexamine	No	DOW, UCC.
Pentylamines (amylamines):		
Dipentylamine	No	HCL, PAS.
Pentylamine, mono-	No	PAS.
Tripentylamine	No	PAS.
Propylamines:		
Dipropylamine	No	AIP, HCL, PAS.
Propylamine, mono-	No	PAS.
Tripropylamine	No	AIP, PAS.
Tetraethylenepentamine	No	DOW, UCC.
N,N,N',N'-Tetramethyl-1,3-butanediamine	No	UCC.
Tetramethylethylenediamine	No	BKM.
Triethylenediamine	No	TX.
Triethylenetetramine	No	DOW, UCC.
All other amines	No	MON, PAC, SCP, TX, UCC.
2-Aminoethanol hydrochloride	No	OMC.
2-Aminoethanol (Monoethanol amine) sulfite	No	EVN.
Aminoethoxyethanol	No	TX.
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	No	DOW, UCC.
2-[(2-Aminoethylamino) ethanol, reaction product with octadecanoic acid	No	BRI.
2-Aminoethyl mercaptoacetate (Monoethanolamine thiolglycolate)	No	EVN.
2-Amino-2-ethyl-1,3-propanediol	No	ANG.
2-Amino-2-(hydroxymethyl)-1,3-propanediol [Tris(hydroxymethyl)aminomethane]	No	ANG, WTK.
2-Amino-2-methyl-1,3-propanediol	No	ANG.
2-Amino-2-methyl-1-propanol	No	ANG.
2-Amino-2-methyl-1-propanol hydrochloride	No	CCC.
Bis(dimethylaminoethyl) ether	No	TX.
tert-Butylaminoethyl methacrylate	No	AAC, CPS.
tert-Butyldiethanolamine	No	PAS.
tert-Butyl urea	No	PAS.
Carbohydrazide	No	OMC.
Choline	No	RH.
Diallyldimethyl ammonium chloride	No	CPS, (2).
Di-amine derivatives of dimer acids	No	WTC
2-Dibutylaminoethanol	No	PAS.
Dibutylaminomethanol	No	(2).
2-Diethylaminoethanol (N,N-Diethylethanolamine)	No	PAS, UCC.
2-(2-Diethylaminoethoxy)ethanol	No	UCC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Diethylaminoethylacrylate, dimethyl sulfate, quaternary salt	No	CPS.
2-Diethylaminoethyl methacrylate	No	AAC, CPS, DUP.
Diethylcarbonyl chloride	No	GAF.
Diethylhydroxylamine	No	PAS.
1,3-Diethyl-2-thiourea	No	PAS.
2-Diisopropylaminoethanol (N,N-Diisopropylethanolamine)	No	PAS, UCC.
2-Diisopropylaminoethyl methacrylate	No	DUP.
Dimethylamine epichlorohydrin copolymer	No	CPS.
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	No	AIP, PAS, TX, UCC.
2-[2-(Dimethylamino)ethoxy]ethanol/dimethylaminopropylene, epoxyated	No	TX.
Dimethylaminoethyl acrylate	No	CPS.
Dimethylaminoethyl acrylate, dimethyl sulfate, quaternary salt	No	CPS.
Dimethylaminoethylacrylate, methyl chloride, quaternary salt	No	AAC, CPS.
Dimethylaminoethyl chloride	No	SK.
Dimethylaminoethyl methacrylate	No	AAC.
Dimethylaminoethylmethacrylate, dimethyl sulfate, quaternary salt	No	AAC, CPS.
Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	No	AAC, CPS, UCC.
Dimethylaminomethanol	No	(?)
2-Dimethylamino-2-methyl-1-propanol	No	ANG.
2-Dimethylamino-2-methyl-1-propanol hydrochloride	No	WPG.
1-(Dimethylamino)-2-propanol	No	PAS.
Dimethylaminopropyl chloride	No	SK.
Ethanolamines:		
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-Ethylenedurea	No	EK.
2-Ethylhexyl nitrate ethyl ester	No	BUC.
N-Ethyl-N-hydroxyethyl-1,4-pentanediamine	No	SDW.
2-Ethyl-2-nitro-1,3-propanediol	No	ANG, SDW.
Fatty acid, alkanolamine ester	No	(?)
Guanidine hydrochloride	No	EK.
Hexamethylenediamine adipate (Nylon salt)	No	DUP, MON, (?)
Hexylamine ethoxylate	No	CXI.
N-(2-Hydroxyethyl)-12-hydroxystearamide	No	CAS.
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tri-(hydroxymethyl)nitromethane)	No	ANG.
Iminodiacetic acid	No	HMP.
Isopropanolamines:		
Diisopropanolamine	No	DOW.
Dimethyl isopropanolamine	No	PEL.
Monoisopropanolamine	No	DOW.
Trisopropanolamine	No	DOW.
2-Isopropylaminoethanol	No	PAS, UCC.
3-Methoxypropylamine	No	BAS, TX.
Methylaminoacetaldehyde dimethyl acetal (MAADMA)		
2-Methylaminoethanol (N-Methylethanolamine)	No	ASL.
Methyl ammonium chloride	No	PAS, UCC.
Methyl hydrazine, mono	No	NOD.
2,2'-(Methylimino)diethanol (Methyldiethanolamine)	Yes	OMC.
Methyl isocyanate	No	DOW, PAS, TX, UCC. RDA.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Nitrogenous compounds—Continued		
2-Methyl-2-nitro-1-propanol	No	ANG.
Mixed higher glycol amine (MHGA)	No	AIP.
Nitrated lard oil	No	SM.
Nitriles:	Yes	
Acetonitrile	Yes	BKC, DUP, SOH, (?).
Acrylonitrile, monomer	Yes	ACY, 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, RCN.
n-Butyronitrile	No	EKX.
Cyanoacetic acid (Malonic nitrile)	No	NOD.
1-(2-Cyanoethyl)ethyl urea	No	GAF.
Decylnitrile	No	ARC.
3-Ethoxypropionitrile	No	DIX.
Ethyl cyanoacetate	No	NOD.
Hexadecylnitrile	No	ARC.
Isobutyronitrile	No	EKX.
Lauronitrile (Dodecyl nitrile)	No	ARC.
3-Methoxypropionitrile	No	(?).
Methyl cyanoacetate	No	NOD.
4-Methyl-5-hydroxymethyl imidazole	No	SK.
2-Methylactonitrile (Acetone cyanohydrin)	Yes	CYR, DUP, RH, SOH.
Octadecenenitrile (Oleonnitrile)	No	ARC.
Octadecylnitrile	No	ARC.
Propionitrile	No	MON.
Tallow nitrile	No	ARC, SHX.
3,3'-Thiodipropionitrile	No	EVN.
Trichloroacetoneitrile	No	OMC.
All other nitriles	No	ARC, EKT, HXL, RSA.
Nitroethane	No	ANG, GON.
Nitromethane	No	ANG, GON.
1-Nitropropane	No	ANG, GON.
2-Nitropropane	No	ANG, GON.
N-n-Octyl glucamine	No	(?).
Semicarbazide hydrochloride	No	OMC.
Stearylamidopropyl dimethylamine lactate	No	WM.
Tetraethyl ammonium bromide	No	RSA.
Tetramethylammonium chloride	No	RSA.
Thiosemicarbazide	No	FMT.
Triethanolamine hydrochloride	No	WPG.
Triethanolamine, sulfuric & phosphoric acid salts	No	(?).
Triethylamine, nitric acid salt	No	(?).
Zinc bis(monooethanolamine)dichloride	No	(?).
All other nitrogenous compounds, acyclic	No	ADC, ARC, EK, HXL, OMC, PFZ, REG, RSA, TX, UCC, (?), (?).
Acids, acid anhydrides, and acyl halides:	Yes	
Acetic acid, synthetic (100%)	Yes	AIP, ARC, BCP, DAZ, EKT, HCL, RDA, SC, UCC, USI.
Acetic anhydride, other than recovered	No	EKT, HCL
Acrylic acid	Yes	BAS, HCL, RH, UCC.
Adipic acid	No	BFG, DUP, MON.
Anhydride-acid mixture	No	HCL.
Azelaic acid	No	SCP.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics'	Manufacturers' Identification codes (according to list in table 15-3)
Acyclic—Continued		
Acids, acid anhydrides, and acyl halides—Continued		
2,2-Bis(hydroxy-methyl)-propionic acid	No	IMC.
Bromoacetic acid	No	WCC.
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	NCC, PFZ.
Citric acid	No	MLS, PFZ.
Crotonic acid (2-Butenoic acid)	No	EKT.
Decanoyl chloride	No	RCN.
2,2-Dichloroacetyl chloride	No	RDA.
Dimer acid (C ₃₀ aliphatic dibasic acid)	Yes	SCP, SYL, WTC.
Dimethylpropionic acid (Neopentanoic acid)	No	ENJ, QTR.
Dithiodiglycolic acid	No	EVN.
Dithiodipropionic acid	No	EVN.
Dodecanedioic acid	No	DUP.
2-Ethylhexanoic acid (α -Ethylcaproic acid)	No	EKT, UCC.
2-Ethylhexanoyl chloride	No	PPG, RCN, WTC.
Fatty acids	No	ARC, BRD, CAS, DRL, WTC.
Fatty acids, hydrogenated	Yes	ARC, BRD, CAS, DRL, SHX, SYP, WTC.
Fatty acids, partially hydrogenated	No	SYP, WTC.
Formic acid, 90%	No	HCL.
Fumaric acid	Yes	MLS, MON, PFZ.
Gluconic acid, technical	No	PFZ, PMP.
Glycolic acid (Hydroxyacetic acid)	No	DUP.
Heptanoic acid	No	HCL.
Isoascorbic acid (Erythorbic acid)	No	PFZ.
Isobutyric acid	No	EKX.
Isobutyric anhydride	No	EKT.
Isobutyryl chloride	No	SYL.
Isononoyl chloride	No	HCL.
Itaconic acid (Methylenesuccinic acid)	No	PFZ.
Lactic acid, 100%	No	SC.
Lauroyl chloride	No	RCN.
Malic acid	No	MLS.
Mercaptoacetic acid (Thioglycolic acid)	No	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 ₈ -C ₁₂ acids	No	ENJ.
Neodecanoic acid	No	ENJ.
Neodecanoyl chloride	No	PPG, WTC.
Neohexanoic acid	No	WTC.
Nonanoic acid (Pelargonic acid)	No	HCL, SCP.
Octanoyl chloride	No	RCN, WCC.
Oleic acid	No	BRD, DRL, WTC.
Oxidized Fischer-Tropsch wax	No	SQA.
Palmitoyl chloride	No	HCL.
Pivaloyl chloride	Yes	PPG, RCN, WCC, WTC.
Polyacrylic acid	No	BFG, BKM, RH.
Propionic acid	No	EKT, HCL, UCC.
Propionic anhydride	No	EKT.
Propionyl chloride	No	WCC.
Sebacic acid	No	WTH.
Sebacoyl chloride	No	ALD.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Acids, acid anhydrides, and acyl halides—Continued		
Sorbic acid (2,4-Hexadienoic acid)	No	MNA.
Stearoyl chloride	No	RCN.
3,3'-Thiodipropionic acid	No	EVN.
Thiodisuccinic acid	No	EVN.
Trifluoroacetic acid	No	HOC.
Trifluoroacetic anhydride	No	HOC.
Trifluoroacetyl chloride	No	HOC.
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, ENJ, HOC, PG, SCP, UCC, WCC, WTC.
Salts of organic acids:	Yes	
Acetic acid salts:	Yes	
Aluminum acetate	No	NCC.
Ammonium acetate	No	BKC, WTK.
Barium acetate	No	BKC.
Calcium acetate	No	HFT, NCC.
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, EKT, SHP.
Manganese acetate	No	SHP.
Nickel acetate	No	SHP.
Potassium acetate	Yes	BKC, HCP, NCC, PEL.
Sodium acetate	Yes	ATL, BKC, BRI, DAN, HCP, JRC, MAL, NCC, UCC, (?).
Sodium diacetate	No	HCP, JRC, NCC.
Zinc acetate	Yes	BKC, CCC, SHP, WTK.
Zirconium acetate	No	CCC, TZC.
Adipic acid, ammonium salt	No	ACS.
Adipic acid, sodium salt	No	(?).
Adipic dihydrazide	No	FMT.
3-Allyloxy-2-hydroxypropane sulfonic acid, sodium salt	No	AAC.
Citric acid salts:		
Ammonium citrate	No	PFZ.
Calcium citrate	No	PFZ.
Potassium citrate	No	HXL, MLS, PFZ, (?).
Sodium citrate	No	BRI, HXL, MLS, PFZ, (?).
Diammonium dithiodiglycolate	No	EVN.
2-Ethylhexanoic acid (alpha-Ethylcaproic acid) salts	Yes	
Aluminum 2-ethylhexanoate	No	NOC.
Barium 2-ethylhexanoate	No	NOD, WTC.
Bismuth 2-ethylhexanoate	No	SHP.
Cadmium 2-ethylhexanoate	No	CCA, VNC, WTC.
Calcium 2-ethylhexanoate	Yes	CCA, FER, MCI, NOD, 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.
Manganese 2-ethylhexanoate	Yes	CCA, MCI, NOD, SHP, TRO.
Nickel 2-ethylhexanoate	No	MCI, SHP.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Salts of organic acids—Continued		
2-Ethylhexanoic acid (alpha-Ethylcaproic acid) salts—Continued		
Potassium 2-ethylhexanoate	No	CCA, MCI, PEL, WTC.
Rare earth 2-ethylhexanoate	No	CCA, MCI.
Stannous 2-ethylhexanoate	No	FER.
Zinc 2-ethylhexanoate	Yes	CCA, FER, MCI, NOD, OMC, SHP, TRO, VNC, WTC.
Zirconium 2-ethylhexanoate	Yes	CCA, FER, MCI, NOD, TRO.
All other 2-ethylhexanoic acid salts	No	NOD.
Fleh oil, C ₁₄ -C ₂₂ menhaden, lead salts	No	ELC.
Formic acid salts:		
Aluminum formate	No	RSA.
Ammonium formate	No	WTK.
Calcium formate	No	IMC, QTR.
Sodium formate	No	PST.
Gluconic acid salts:		
Sodium gluconate	No	PFN, PFZ, PMP.
Glycolic acid, potassium salt	No	HCP, JRC.
Glycolic acid, sodium salt	No	HCP, JRC.
Isoscorbic acid, sodium salt (Sodium erythorbate)	No	PFZ.
Tertiary-alpha-alkylcarboxylic acid salts (isocarboxylic acid salts):		
Calcium t- α -alkylcarboxylate	No	MCI.
Cobalt t- α -alkylcarboxylate	No	MCI.
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	No	MCI.
Isooctanoic acid salts:		
Isooctanoic acid, calcium salt	No	CCA.
Isooctanoic acid, lead salt	No	CCA.
Isooctanoic acid, manganese salt	No	CCA.
Lactic acid salts:		
Ammonium lactate	No	WM.
Sodium lactate (Nalac)	No	BFP, PFN.
All other lactic acid salts	No	PFN.
Lauric acid salts:		
Barium cadmium laurate	No	FER, WTC.
Barium laurate	No	SYP.
Cadmium laurate	No	SYP.
Lauric acid, zinc salt	No	SYP.
Tin laurate	No	FER.
All other lauric acid salts	No	(?)
Maleic acid salts:		
Dibutyltin maleate	No	WTC.
Mercaptoacetic acid (thioglycolic acid) salts:		
Ammonium mercaptoacetate	No	EVN, WTC.
Sodium mercaptoacetate	No	EVN.
Neodecanoic acid salts:		
Bismuth neodecanoate	No	SHP.
Calcium neodecanoate	Yes	FER, MCI, SHP.
Cobalt neodecanoate	No	MCI, SHP.
Lead-cobalt neodecanoate	No	MCI.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Salts of organic acids—Continued		
Neodecanoic acid salts—Continued		
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:		
Calcium oleate	No	(?).
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.
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, ELC.
Sodium dihexyl phosphorodithioate	No	ACY, ELC.
Sodium diisobutyl phosphorodithioate	No	ELC.
Sodium diisopropyl phosphorodithioate	No	ACY, ELC.
Propionic acid salts:		
Ammonium propionate	No	KMI.
Calcium propionate	Yes	HFT, KMI, NCC.
Sodium propionate	No	HFT, NCC.
Ricinoleic acid salts	No	CAS.
Sodium-N-methyl-N-oleyl taurate	No	WPG.
Stearic acid salts:		
Aluminum stearates:	Yes	
Aluminum distearate	No	MAL, NOC, NOD, SYP.
Aluminum monostearate	No	MAL, NOD, SYP.
Aluminum tristearate	Yes	MAL, NOC, NOD, SYP, WTC. (?).
Ammonium stearate	No	WPG.
Barium stearate	Yes	ALI, NOC, NOD, SYP, WTC.
Cadmium stearate	No	SYP, WTC.
Calcium stearate	Yes	FER, MAL, NOC, NOD, SCP, 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, NOD, SYP, WTC.
Manganese stearate	No	SHP.
Potassium stearate	No	WTC.
Sodium stearate	No	NOC, WTC.
Strontium stearate	No	WTC.
Zinc stearate	Yes	CCC, MAL, NOC, NOD, PLS, SCP, SYP, WTC.
Tartaric acid salts:		
Potassium sodium tartrate	No	PFZ.
Thioacetic acid, potassium salt	No	RSA.
All other salts of organic acids	No	EK, EKX, RSA, SDC, (?).
Aldehydes:		
Acetaldehyde	No	EKX, HCL.
Acrolein (Acrylaldehyde)	No	UCC.

See footnote at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Aldehydes—Continued		
Butyraldehyde	Yes	BAS, EKX, HCL, UCC.
Crotonaldehyde	No	EKT.
2-Ethylhexanal (α -Ethylcaproaldehyde)	No	EKX, UCC.
Formaldehyde (37% HCHO by weight)	Yes	BCP, BOR, CBD, DUP, GAF, GP, HCL, HPC, IMC, MON, QTR, WCL, UCC.
Glutaraldehyde	No	UCC.
Glyoxal	No	ACY, BAS.
Isobutyraldehyde	No	BAS, EKX, HCL, UCC.
Propionaldehyde	No	EKX, HCL, UCC.
Valeraldehyde (Pentanal)	No	UCC.
All other aldehydes, acyclic	No	UCC.
Ketones:		
Acetone	Yes	ACS, ART, ATR, BTL, DOW, ENJ, GE, GGC, SHC, TX, UCC.
5-Chloro-2-pentanone	No	SDW.
1-Chloropropylacetone	No	CHG.
Diisopropyl ketone (2,4-Dimethyl-3-pentanone)	No	EKX.
2-Heptanone (Methyl amyl ketone)	No	EKT.
3-Heptanone (Ethyl butyl ketone)	No	UCC.
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	Yes	HCL, SHC, UCC.
Isovalerone (Diisobutyl ketone)	No	EKT, UCC.
Methyl ethyl ketone (2-Butanone)	Yes	ATR, ENJ, HCL, LYP, SHC, UCC.
5-Methyl-2-hexanone (Methyl Isoamyl ketone)	No	EKT.
Methyl isobutyl ketone	Yes	EKT, ENJ, SHC, UCC.
Methylisopropyl ketone	No	EKX.
Methylpropyl ketone	No	EKT, UCC.
Methylpseudolone	No	NCI.
2-Octanone (Hexyl methyl ketone)	No	UPM, WTH.
2,4-Pentanedione (Acetylacetone)	No	UCC.
3-Pentanone (Diethyl ketone)	No	UCC.
Pseudolone	No	NCI, SCM.
2,6,8-Trimethyl-4-nonanone (Isobutyl heptyl ketone)	No	UCC.
All other ketones	No	EKT.
Alcohols, monohydric, unsubstituted:		
Alcohols, C ₁₁ or lower, unmixed (95% or more pure):	Yes	
Allyl alcohol	No	ATR, FMB.
Amyl alcohols:		
2-Methyl-1-butanol	No	UCC.
3-Methyl-1-butanol	No	CPS.
1-Pentanol	No	UCC.
Butyl alcohols:		
n-Butyl alcohol (n-Propylcarbinol)	Yes	BAS, CXI, EKX, GAF, HCL, SHC, UCC, VST.
sec-Butyl alcohol (Methylethylcarbinol)	No	ENJ, SHC.
tert-Butyl alcohol (Trimethylcarbinol)	No	ATR.
Isobutyl alcohol (Isopropylcarbinol)	Yes	BAS, CPS, EKX, HCL, SHC, UCC.
1-Decanol	No	TNA, VST.
2,2-Dimethylbutanol (Isohexyl alcohol)	No	ENJ.
1-Docosanol (Behenyl Alcohol C ₂₂)	No	SHX.
Ethyl alcohol, synthetic	Yes	DOW, EKX, HCL, SHC, UCC, USI, VST.
2-Ethyl-1-hexanol	Yes	ART, BAS, EKX, SHC, UCC.
n-Heptyl alcohol	No	EKX.
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.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Alcohols, monohydric, unsubstituted—Continued		
Alcohols, C ₁₁ or lower, unmixed (95% or more pure)—Continued		
Isopropyl alcohol	Yes	ATR, ENJ, LYP, SHC, UCC.
Methanol, synthetic	Yes	AIP, BCP, DUP, EKT, GGC, HCL, LYP, PLC, TOC.
2-Methyl-1-pentanol	No	UCC.
4-Methyl-2-pentanol (1-Methylisobutylcarbinol)	No	ENJ, UCC.
1-Octanol	No	TNA, VST.
2-Octanol (sec-Capryl alcohol)	No	WTH.
Propyl alcohol (Propanol)	Yes	EKX, HCL, UCC.
2-Propyn-1-ol (Propargyl alcohol)	No	GAF.
Undecanol (Linear C ₁₁ alcohol)	No	BAS, ENJ.
All other alcohols, unmixed C ₁₁ or lower (95% or more pure)	No	SHC, UCC.
Alcohols C ₁₂ or higher, unmixed (95% or more pure):		
Dodecyl alcohol (Lauryl alcohol)	No	PG, TNA, VST.
1-Hexadecanol (Cetyl alcohol)	No	ENJ, PG, VST.
Hexadodecyl alcohol	No	TX.
1-Octadecanol (Stearyl alcohol)	Yes	ENJ, PG, TNA, VST.
cis-9-Octadecan-1-ol (Oleyl alcohol)	No	SHX.
1-Tetradecanol (Myristyl alcohol)	No	PG, VST.
1-Tridecanol	No	ENJ.
All other alcohols, unmixed C ₁₂ or higher (95% or more pure)	No	ENJ.
Mixtures of alcohols:		
Alcohol mixtures, C- ₁₁ or lower	Yes	BAS, ENJ, PG, SHC, TNA, VST.
Mixtures of alcohols, C ₁₂ and higher	Yes	ENJ, PG, SHC, SHX, TNA, VST.
All other alcohol mixtures	No	VST, WTK.
Esters of monohydric alcohols:		
Acrylic monomers, mixed	No	CPS.
C ₁₂ -C ₁₈ Alcohol esters of lactic acid	No	VND.
Allyl methacrylate	No	BRD, CPS.
Amyl acetates:		
Amyl acetate (n-Pentyl acetate)	No	UCC.
All other amyl acetates	No	RCN.
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.
Butyl lactate	No	CPS.
Butyl maleate	No	SCP.
Butyl mercaptopropionate	No	EVN.
Butyl methacrylate	No	DUP, RH.
Butyl oleate	No	ELC.
n-Butyl perchlorocrotonate	No	MAL.
Cetylcosyl methacrylate	No	RH.
Cetyl lactate	No	VND.
Chlorohydroxypropyl methacrylate	No	AAC.
Diallyl maleate	No	AAC.
Dibutyl maleate	No	ART, NOD.
Didecyl adipate	No	QCP.
Diethyl carbonate (Ethyl carbonate)	No	PPG.
Di(2-ethyl-1-hexyl) maleate	No	BRI, CHP.
Diethyl maleate	No	ACY.
Diethyl oxalate (Ethyl oxalate)	No	(²).
Dilauryl-3,3'-thiodipropionate	Yes	CCW, EVN, WTC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Dimethyl carbonate	No	PPG.
Dioctyl maleate	No	ART, NOD.
Distearyl-3,3'-thiodipropionate	Yes	ACY, CCW, EVN, WTC.
Dithiols (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	CNE, UCC.
Ethyl acetate (100% basis)	Yes	EKT, EKX, HCL, MON.
Ethyl acetoacetate	No	EKT.
Ethyl acrylate	No	HCL, RH.
Ethyl chloroformate	No	PPG.
Ethyl chlorothioformate	No	ICI.
2-Ethyl-1-hexyl acetate	No	EKT.
2-Ethyl-1-hexyl acrylate	Yes	BAS, HCL, UCC.
2-Ethylhexyl chloroformate	Yes	HCL, PPG, VCM.
2-Ethyl-1-hexyl methacrylate	No	DUP.
Ethyl maleate, mono	No	AAC.
Ethyl methacrylate	No	DUP.
Ethyl silicate	No	UCC.
Ethyl sulfate (Diethyl sulfate)	No	UCC.
Fatty acid esters, not included with plasticizers or surface active agents:	Yes	
Dilaopropyl dimerate	No	SBC.
Dilaostearyl 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	PG.
Methyl esters of lard	No	FER.
Methyl esters of tallow	Yes	CHL, FER, WTC.
Methyl 12-hydroxystearate	No	CAS, WTH.
Methyl iso-octadecenoate	No	SYL.
Methyl linoleate	No	HRT.
Methyl pentachlorostearate	No	VCM.
Methyl stearate	No	CHL, WTC.
Myristyl myristate	Yes	AAC, SBC, VND.
Stearyl stearate	No	AAC.
Tridecyl stearate	No	HCL, RPC, WTC.
All other fatty acid esters, not included with plasticizers surface-active agents	No	ALI, SCP.
Hexyl acetate	No	ENJ.
Hexyl acrylate	No	CPS.
Isobutyl acrylate	No	BAS.
Isobutyl chloroformate	No	PPG, VCM.
Isobutyl isobutyrate	No	EKK.
Isobutyl methacrylate	No	RH.
Isodecyl acrylate	No	AAC, CPS.
Isodecyl mercaptoacetate	No	EVN.
Isodecyl methacrylate	No	RH.
Isooctyl acrylate	No	AAC.
Iso-octyl mercaptoacetate	No	EVN.
Iso-octyl-3-mercaptopropionate	No	EVN.
Isopropyl acetate	Yes	EKT, HCL, UCC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Isopropyl chloroformate	No	PPG, VCM.
Isostearyl neopentanoate	No	SBC, VND.
Lauryl acrylate	No	CPS.
Lauryl lactate	No	VND.
Lauryl methacrylate	No	AAC, CPS, RH.
1-Methoxy-2-ethyl acetate	No	EKX.
2-Methoxyethyl acrylate	No	CPS.
Methyl acetate	No	EKT.
Methyl acetoacetate	No	EKT.
Methyl acrylate, monomer	No	BAS, HCL.
Methyl butyrate	No	PD.
Methyl chloroformate	No	PPG.
Methyl formate	No	HCL.
Methyl methacrylate, monomer	Yes	CYR, DUP, RH.
Methyl pivaloylacetate	No	EKT.
Methyl sulfate (Dimethyl sulfate)	No	DUP.
Myristyl lactate	No	VND.
Phosphorus acid esters:	Yes	
Bis(2-chloroethyl)-2-chloroethylphosphonate	No	ALW.
Bis(2-ethylhexyl)hydrogen phosphite	No	ALW.
Butyl acid phosphate	No	ALW, HK.
Chloroalkyl diphosphate ester, neutral	No	ALW.
Chloroalkyl phosphate ester	No	ALW.
Dibutyl butylphosphonate	No	ALW.
Dibutyl hydrogen phosphite	No	ALW.
Dibutyl pyrophosphate	No	ALW.
Diethylhexyl phosphoric acid	No	ALW.
Diethyl hydrogen phosphite	No	ALW.
Diethyl phosphenothonic dichloride	No	TNA.
Diethyl phosphorochloridodithionate	No	ICI, TNA.
Dimethyl hydrogen phosphite	No	ALW.
Dimethyl methylphosphonate	No	ALW.
Dimethyl phosphoridodithionate	No	ICI.
2-Ethylhexyl hydrogen phosphate	No	ALW.
Iso-octyl hydrogen phosphate	No	ALW.
Methyl dihydrogen phosphate	No	HK.
Stearyl acid phosphate	No	HK.
Tetrakis(2-chloroethyl)ethylene diphosphate	No	OMC.
Tetrakis(2-chloroisopropyl)ethylene diphosphate (T-RDT)	No	OMC.
Trialkyl phosphite	No	GE.
Triethyl phosphite	No	ALW, ICI.
Trisodocylphosphite	No	WTC.
Trisooctyl phosphite	No	ALW, GE.
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, AMV, AZT, COC, (*), BAS, EKT, HCL, RCN, UCC.
Propyl acetate	Yes	
Propyl chlorothioformate	No	ICI.
Stearyl methacrylate	Yes	CPS, RH, TX.
Tetraethyl orthosilicate (Tetraethyl silicate)	No	UCC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 15-3)
Acyclic—Continued		
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
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	DUP.
Triethyl orthoacetate	No	NOD.
Triethyl orthoformate	No	NOD.
Triethyl orthopropionate	No	NOD.
Trifluoroethyl methacrylate	No	(²).
Trimethyl orthoacetate	No	NOD.
Trimethyl orthoformate	No	NOD.
Vinyl acetate, monomer	Yes	DUP, HCL, UCC, USI.
All other monohydric alcohol esters	No	BAS, COC, ENJ, MON, MRF, PAH, SDC, VND, (²), (²).
Polyhydric alcohols:		
1,2-(and 1,3)-Butanediol	No	HCL.
1,4-Butanediol	Yes	BAS, DUP, GAF.
2-Butene-1,4-diol	No	GAF.
2-Butyne-1,4-diol	No	BAS, GAF.
3-Chloro-1,2-propanediol (Glycerol α -chlorohydrin)	No	DIX, EVN.
Dibromoneopentyl glycol	No	TNA.
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	No	BAS, EKX.
Ethylene glycol	Yes	BAS, CNE, CXI, DOW, EKX, HCF, HCL, OMC, PDG, PLC, SHC, TX, UCC, USI, KQO, UCC.
2-Ethyl-1,3-hexanediol	No	
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	No	HCL.
Glycerol, synthetic only	No	DOW, RQT, SYP.
1,6-Hexanediol	No	BAS, CXI.
2-(Hydroxymethyl)-2-methyl-1,3-propanediol (Trimethylolthane)	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, QTR.
1,5-Pentanediol	No	BAS.
Propylene glycol (1,2-Propanediol)	Yes	ATR, DOW, OMC, TX, UCC.
Sorbitol (70% by weight)	Yes	BRD, EHC, HOF, ICI, PFZ, RQT.
Trimethylolthane	No	QTR.
2,2,4-Trimethyl-1,3-pentanediol	No	EKX.
All other polyhydric alcohols	No	ATR, ICI, VIK, (²).
Esters of polyhydric alcohols:		
2-(2-Butoxyethoxy)ethyl acetate	No	CNE, EKT, UCC.
2-Butoxyethyl acetate	Yes	CNE, EKT, UCC.
1,3-Butylene glycol dimethacrylate	No	CPS.
Diethylene glycol adipate	No	CMB, HAL.
Diethylene glycol, borated	No	OMC.
Diethylene glycol chloroformate	No	PPG.
Diethylene glycol dimethacrylate	No	CPS.
2-(2-Ethoxyethoxy)ethyl acetate	No	EKT.
Ethylene carbonate	No	TX.
Ethylene glycol diacetate	No	CPS, EKT.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Esters of polyhydric alcohols—Continued		
Ethylene glycol dimercaptoacetate	No	EVN.
Ethylene glycol dimethacrylate	No	CPS.
Glycerides, mixed C ₁₄ -C ₁₈ and C ₁₈ -C ₁₈ , mono and di	No	
Glyceryl diacetate (Diacetin)	No	HAL.
Glyceryl monoacetate (Monoacetin)	No	HAL.
Glyceryl monothloglycolate	No	EVN, WTC.
Glyceryl triacetate (Triacetin)	No	EKT
Glyceryl tristearate	No	BRD.
Hydroxyethyl acrylate	No	DOW, RH.
Hydroxyethyl methacrylate	No	RH.
Hydroxypropyl acrylate	No	DOW, RH.
Hydroxypropyl methacrylate	No	AAC, RH.
2-Methoxyethyl acetate	No	UCC.
1-Methoxy-2-propyl acetate	No	EKT, HTM.
Nopeopentyl glycol dicaprate	No	SBC.
Pentaerythritol stearate	No	BRD.
Pentaerythritol tetrakis (3-Mercaptoproponate)	No	EVN.
Pentaerythritol tetrastearate	No	HPC.
Propylene glycol dicaprylatecaprate	No	ATR, TX.
Sucrose octa-acetate	No	HFT.
Trimethylolpropane decanoic acid ester	No	SM.
Trimethylolpropane ethoxylate triacrylate	No	AAC.
Trimethylolpropane triacrylate	No	CPS.
Trimethylolpropane tri(2-mercaptoproponate)	No	EVN.
Trimethylolpropane trimethacrylate	No	AAC, CPS.
Trimethylolpropane trioleate (TMP trioleate)	No	EFH.
2,2,3-Trimethyl-1,3-pentanediol monoisobutyrate	No	EKX.
Tripropylene glycol diacrylate	No	CPS.
All other polyhydric alcohol esters	No	DUP, EK, GPI, SQA, TX, UCC, WM.
Polyhydric alcohol ethers:	Yes	
Propylene-based polyhydric alcohol ethers	No	(?).
Bis(2-butoxyethyl)ether (Diethylene glycol di-n-butyl ether)	No	FER.
Bis(2-ethoxyethyl)ether (Diethylene glycol diethyl ether)	No	FER.
Bis[2-(2-methoxyethoxy)ethyl] ether (Tetraethylene glycol dimethyl ether)	No	FER.
Bis(2-methoxyethyl)ether (Diethylene glycol dimethyl ether)	No	FER.
2-Butoxyethanol (Ethylene glycol monobutyl ether)	Yes	CNE, DOW, EKX, SHC, UCC.
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	Yes	CNE, DOW, EKX, OMC, SHC, UCC.
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	Yes	CNE, DOW, UCC.
1-Butyraldehyde trimer	No	HTM.
Diethylene glycol	Yes	BAS, CNE, CXI, EKX, HCL, OMC, PDG, SHC, TX, UCC.
Difunctional epoxy acrylate	No	SQA.
Dimethoxyethane (Ethylene glycol dimethyl ether)	No	FER.
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	Yes	CNE, EKX, OMC, UCC.
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	Yes	CNE, EKX, OMC, UCC.
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	No	OMC, UCC.
Ethylene glycol di-tributyl ether	No	EKX.
Ethylene glycol di-triethyl ether	No	FER.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Esters and ethers of polyhydric alcohols—Continued		
Polyhydric alcohol ethers—Continued		
Ethyl ethers of tetra and higher ethylene glycols (high boiling)	No	OMC.
Glycerol monoallyl ether	No	AAC.
Glycol ethers derived from propylene oxide:	Yes	
Dipropylene glycol	Yes	ATR, DOW, OMC, TX.
Dipropylene glycol monomethyl ether (3-[3-methoxypropoxy]propanol)	No	OMC, UCC.
Ethylene glycol di-tri-propyl ether	No	EKX.
Propylene glycol t-butyl ether	No	HTM.
Propylene glycol monomethyl ether (1-Methoxy-2-propanol)	No	OMC.
Tripropylene glycol	No	ATR, DOW, UCC.
Tripropylene glycol monomethyl ether (3-[3-methoxypropoxy]propanol)	No	OMC.
All other propylene glycol ethers (and propylene glycols)	No	HTM.
2-[2-(Hexyloxy)ethoxy]ethanol	No	UCC.
2-Methoxyethanol (Ethylene glycol monomethyl ether)	Yes	CNE, OMC, UCC.
2-[2-Methoxyethoxy]ethanol (Diethylene glycol monomethyl ether)	Yes	CNE, DOW, OMC, UCC.
2-[2-(2-Methoxyethoxy)ethoxy]athanol (Triethylene glycol monomethyl ether)	Yes	DOW, OMC, UCC.
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	No	FER, OMC.
Methoxypolyethylene glycol	No	AAC, HCL, PPG, UCC.
Paraformaldehyde	No	HCL.
Polyethoxy propoxy diethylene glycol ether	No	AAC.
Poly(ethylene-butylene) glycol	No	(²).
Polyethylene glycol	No	AAC, ABB, BAS, DOW, GAF, HCL, OMC, PPG, SCP, UCC, (²), (²).
Polyethylene glycol butyl ether, propoxylated	No	ICI.
Polyethylene glycol dimethyl ether	No	DAN, SHX.
Polyglycols, ethylene glycol and glycol ether, mixed	Yes	CXI, HCL, UCC, (²).
Polymethylvinyl ether monoethylmaleate	No	TNI.
Polyoxyalkylene glycol	No	OMC.
Polytetramethylene glycol ether	Yes	BAS, DUP, QKO.
Polyether polyols based on propylene oxide:		
Polypropylene glycol	No	AAC, BAS, DOW, GAF, HCL, OMC, PPG, TX, (²).
Polypropylene glycol butyl ether (Polypropoxy butyl ether)	No	(²).
Polypropylene glycol butyl ether, ethoxylated (Polypropoxy butyl ether, ethoxylated)	No	BAS, SCP.
All other polyether polyols based on propylene oxide		
Propoxyethanol (Ethylene glycol monopropyl ether)	No	ATR.
Sorbitol, alkoxylated	No	EKX.
Sorbitol, ethoxylated	No	(²).
Sorbitol monostearate	No	BRD, ICI, (²).
Sorbitol, propoxylated	No	WTC.
Sulfone diglycol	No	ICI.
Tetraethylene glycol	No	AAC.
Tetra/penta glycols, mixed	No	DOW, EKX, UCC.
2,2'-Thiodiethanol (Thiodiglycol)	No	CNE, CXI.
Triethylene glycol	Yes	AAC, PLC.
		CNE, CXI, DOW, EKX, HCL, OMC, PDG, SHC, TX, UCC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Esters of polyhydric alcohols—Continued		
Polyhydric alcohol ethers—Continued		
Tri- and tetraethylene glycol monoethyl ethers, borate esters		
No	No	OMC.
All other polyhydric alcohol ethers		
No	No	BAS, DOW, DUP, EKX, MIL, SCP, TX, UCC, WTC.
Brominated, chlorinated and fluorinated hydrocarbons:		
Yes	Yes	
Brominated (Including bromochlorinated) hydrocarbons:		
Yes	Yes	
1-Bromobutane (n-Butyl bromide)	Yes	DAZ, DOW, GTL, UCC.
Bromochloromethane	No	TNA.
Bromodecane (Decyl bromide)	No	WCC.
Bromoethane (Ethyl bromide)	No	GTL.
1-Bromohexadecane	No	HMY.
1-Bromohexane (n-Hexyl bromide)	No	HMY.
1-Bromo-3-methyl-2-butene	No	SD.
1-Bromo-octadecane	No	HMY.
1-Bromopentane (n-Amyl bromide)	No	HMY, WCC.
1-Bromopropane (n-Propyl bromide)	No	DAZ.
Ethylene bis tetrabrom	No	TNA.
Myristyl bromide	No	WCC.
Vinyl bromide (Bromoethylene)	No	TNA.
All other brominated (Including bromochlorinated) hydrocarbons		
No	No	FER, HMY, TNA.
Chlorinated (not otherwise halogenated) hydrocarbons:		
Yes	Yes	
Carbon tetrachloride	No	DOW, FRO, HK, LCP.
Chlorinated paraffins (C₁₀-C₂₀):		
Yes	Yes	
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-Chloropropene (Allyl chloride)	No	DOW, SHC.
1,2-Dichloroethane (Ethylene dichloride)	Yes	ALW, BCP, BFG, DOW, FOR, FRO, GGC, HK, OMC, PLC, PPG, SHC, VST.
2,3-Dichloropropene	No	SHC.
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.
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.
1,2,3-Trichloropropane	No	DOW.
Vinyl chloride, monomer (Chloroethylene)	Yes	BCP, BFG, DOW, FOR, GGC, HK, PPG, VST.
Vinylidene chloride, monomer (1,1-Dichloroethylene)		
No	No	DOW, PPG.
All other chlorinated (not otherwise halogenated) hydrocarbons		
No	No	(²).
Fluorinated (Including other fluorohalogenated) hydrocarbons:		
Yes	Yes	
Bromochlorodifluoromethane	No	GTL.
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.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Brominated, chlorinated and fluorinated hydrocarbons—Continued		
Fluorinated (including other fluorohalogenated) hydrocarbons—Continued	Yes	
1-Chloro-1,1-difluoroethane (F-142b)	No	PAS.
Chlorodifluoromethane (F-22)	Yes	ACS, DUP, LRO, PAS, RCN.
Chloropentafluoroethane	No	GTL.
2-Chloro-1,1,1,2-tetrafluoroethane	No	SCM.
Chlorotrifluoroethylene (Trifluorovinyl chloride)	No	ACS.
2-Chloro-1,1,2-trifluoroethyl methyl ether	No	OH.
Chlorotrifluoromethane (F-13)	No	DUP.
Dibromodifluoromethane	No	GTL.
Dichlorodifluoromethane (F-12)	Yes	ACS, DUP, LRO, PAS, RCN.
Dichlorotetrafluoroethane (F-114)	No	ACS, DUP.
Dichloro-trifluoroethane (F-123)	No	DIX, HOC.
1,1-Difluoroethane	No	DUP.
Hexafluoropropylene, monomer	No	DUP.
1-Iodoperfluorohexane	No	DUP.
Polytetrafluoroethylene ethyl iodide	No	(?)
1,2,2,2-Tetrafluoroethane	No	HOC.
Tetrafluoroethylene (F-1114)	No	DUP.
Tetrafluoromethane (F-14)	No	DUP.
Trichlorofluoromethane (F-11)	Yes	ACS, DUP, LRO, PAS, RCN.
Trichlorotrifluoroethane (F-113)	No	ACS, DIX, DUP, PAS.
Trifluoropropene	No	HOC.
Vinyl fluoride, monomer	No	DUP.
Vinylidene fluoride, monomer	No	PAS.
All other fluorinated (including other fluorohalogenated) hydrocarbons	No	DUP, HOC, REG.
Other miscellaneous acyclic chemicals:		
Iodinated (not otherwise halogenated) hydrocarbons:	Yes	
Diodomethane (Methylene iodide)	No	DPW.
Ethylhexyl iodide (Iodoethyl hexane)	No	RSA.
Iodobutane	No	RSA.
Iodoethane (Ethyl iodide), non-medical	No	DPW, RSA.
Iodomethane (Methyl iodide)	No	RSA.
All other iodinated (Not otherwise halogenated) hydrocarbons	No	DPW, RSA.
2-(Acetoacetoxy)ethyl methacrylate	No	EKT.
Acetylacetonates:		
Aluminum acetylacetonate	No	MCK.
Titanium acetylacetonate	No	NOD.
All other acetylacetonates	No	MCK.
Acyclic peroxides:		
Acetylacetone peroxide	No	CAD.
tert-Amyl hydroperoxide	No	WTC.
2-Butanone peroxide (MEK peroxide)	Yes	CAD, FRE, NOC, RCN, WTC.
n-Butyl-4,4-bis[t-butylperoxy]valerate	No	RCN.
tert-Butyl hydroperoxide	No	ATR, AZT, FRE, RCN.
tert-Butyl peroxide (Di-tert-butyl peroxide)	Yes	AZT, RCN, WTC.
tert-Butyl peroxyacetate	No	AZT, RCN.
tert-Butyl peroxy-2-ethylhexanoate	No	RCN, WTC.
tert-Butyl peroxyisobutyrate	No	RCN.
tert-Butyl peroxyisopropylcarbonate	No	RCN.
tert-Butyl peroxy maleic acid	No	PAS.
tert-Butyl peroxyneodecanoate	No	RCN, WTC.
tert-Butyl peroxyplvalate	Yes	AZT, RCN, WTC.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' Identification codes (according to list in table 15-3)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Acyclic peroxides—Continued		
Decanoyl peroxide	No	RCN.
Di(sec-butyl)peroxydicarbonate	No	RCN.
Di-(2-ethylhexyl) peroxydicarbonate	No	RCN, WTC.
Dilisononoyl peroxide	No	RCN.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane	No	RCN.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3	No	RCN.
2,5-Dimethyl-2,5-di(2-ethylhexanoyl peroxy)hexane	No	RCN, WTC.
Ethyl 3,3-di(t-butyl peroxy) butyrate	No	RCN.
Lauroyl peroxide	No	RCN.
Peroxyacetic acid (Peracetic acid)	No	FMB.
Succinyl peroxide	No	RCN.
Tertiary amyl per-2-ethylhexanoate	No	WTC.
Carbon disulfide	No	PAS.
Chromium octanoate, activated, catalyst	No	(?)
Cobalt borocyclate	No	AAC.
1,3-Dichloro-2-propanol	No	ARS.
Epoxides, ethers, and acetals:	Yes	
Bis(2-chloroethyl)ether (Dichlorodethyl ether)	No	BKM.
Butylene oxide	No	DOW.
Butyl vinyl ether	No	GAF.
1-Chloro-2-methoxyethane	No	HIL.
Chloromethyl methyl ether	No	RH.
2,2-Dichloro-1,1-difluoroethyl methyl ether	No	OH.
Dlethoxyethane	No	WPG.
Dimethyl sulfone	No	CRZ.
Epichlorohydrin	No	DOW, SHC.
Ethylene oxide	Yes	BAS, CNE, DOW, EKX, HCL, OMC, PLC, SHC, SUN, TX, UCC, USI, VST.
Ethyl ether	No	EKX, USI.
Ethyl vinyl ether	No	GAF.
Glycidol (2,3-Epoxy-1-propanol)	No	DIX.
Glycidyl ethers:	Yes	
Alkyl glycidyl ether, C ₁₂ -C ₁₄ and C ₁₂ -C ₁₈	No	REZ.
Alkyl glycidyl ethers, C ₈ -C ₁₀	No	REZ.
1-(Allyloxy)-2,3-epoxypropane (Allyl glycidyl ether)	No	AAC, CPS.
1,4-Butanediol diglycidyl ether	No	REZ.
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	No	CPS, REZ.
tert-Butyl glycidyl ether	No	CPS.
Dibromoneopentyl glycidyl ether	No	REZ.
Glycidyl decanoate	No	ENJ.
Neopentyl glycol diglycidyl ether	No	REZ.
Polyol glycidyl ether	No	REZ.
Hexadecylsulfonfyl chloride	No	EKT.
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	GAF, NOD.
All other epoxides, ethers, acetals	No	UCC, VIK, (?).
Ethyl succinyl chloride	No	CWN.
Fats and oils, chemically modified:	Yes	
Brominated vegetable oil	No	DOM.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Fats and oils, chemically modified—Continued		
Castor oil, hydrogenated	No	CAS.
Castor oil, polymerized	No	CAS.
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	ARC, CAS, CHL, CJO.
Hydrocarbons:		
n-Decane	No	HMV, PLC.
Dilsubutylene isomers	No	HTM, NCI.
n-Dodecane	No	HMV, PLC.
Hexadecane	No	HMV.
Myrcene	No	SCM, (?).
n-Nonane	No	HMV.
n-Octadecane	No	HMV.
n-Octane	No	HMV, PLC.
All other hydrocarbons	No	DUP, HMV, WTK.
2-Mercaptoethanol	No	AAC, MRT, PLC.
Methyl sulfoxide (Dimethyl sulfoxide)	No	GAY.
Octadecanoic acid, 2-(1-carboxyethoxy)-1-methyl-2-oxoethyl ester, sodium salt	No	WTC.
Organo-aluminum compounds: Yes		
Aluminum di-sec-butoxide acetoacetic ester chelate	No	CHT.
Aluminum diisopropoxide acetoacetic ester chelate	No	CHT, KCH.
Aluminum [1,3-butanediolato(2)-O,O'] (ethyl-3-oxobutanoato-0 ¹ , 0 ² -dihydroxy T-4	No	CHT.
Aluminum ethyl-3-oxobutanoato-0 ¹ , 0 ² -dihydroxy T-4	No	KCH.
Aluminum Isooctoxide, diisopropoxide	No	KCH.
Aluminum Isopropoxide (Aluminum Isopropylate)	No	CHT, KCH.
Aluminum tri-sec-butoxide	No	CHT.
Diethylaluminum chloride	No	TNA, TSA.
Diethyl aluminum ethoxide	No	TSA.
Diethylaluminum iodide	No	TNA, TSA.
Dilsubutylaluminum chloride	No	TNA, TSA.
Dilsubutylaluminum hydride	No	TNA, 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.
Methylaluminum sesquichloride	No	CHT.
Oxoaluminum Isopropoxide	No	KCH.
Oxoaluminum stearate	No	CHT, KCH.
Oxy-aluminum octanoate	No	KCH.
Polyol aluminum chelate	No	SQA.
Tri-n-butylaluminum	No	TNA, TSA.
Triethylaluminum	No	TNA, TSA.
Tri-n-hexyl aluminum	No	TNA, TSA.
Trilsubutylaluminum	No	TNA, TSA.
Trimethylaluminum	No	TNA, TSA.
Tri-n-octylaluminum	No	TNA, TSA.
Tri-oxyaluminum tri-isopropoxide	No	CHT.
All other organo-aluminum compounds	No	KCH.

See footnotes at end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Organo-boron compounds:		
Boric acid-amine adducts	No	FER.
Boron trichloride-amine complex (DY 9577)	No	ASL.
Diethanolamine-borate	No	EFH.
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.
Trimethoxyboroxine	No	(2).
Trimethyl borate	No	MHI.
N,N,N-Trimethyl methanaminium octahydrotriborate	No	(2).
All other organo-boron compounds	No	ASL, HCL, TSA, USB, (2).
Organo-lithium compounds:		
n-Butyllithium	No	FTE.
sec-Butyllithium	No	FTE.
Lithium hydroxystearate	No	WTC.
Organo-magnesium compounds: Yes		
Butyl ethyl magnesium	No	TSA.
n-Butyl magnesium chloride	No	(2).
Di-n-butylmagnesium	No	TSA.
Di-n-hexyl magnesium	No	TSA.
Magnesium methylate	No	SOI.
Organo-silicon compounds:		
N-Aminoethylaminopropyl trimethoxysilane	No	DCC, NOD.
α-Chloropropyltrichlorosilane	No	DCC.
Chloropropyltrimethoxysilane	No	DCC, NOD.
Chlorotrimethylsilane	No	DCC.
Dichlorodimethylsilane	No	DCC.
Dichloromethylsilane	No	DCC.
Dichloromethylvinylsilane	No	DCC, SCM.
Diisobutyl dimethoxychloro silane	No	NOD.
Divinyl tetramethyldisiloxane	No	NOD.
α-Glycidoxypropyltrimethoxysilane	No	DCC, NOD, UCC.
Hexamethyldisilazane	Yes	DCC, NOD, SCM.
Hexyltrichlorosilane	No	SCM.
Isobutyltrimethoxysilane	No	NOD.
Mercaptopropyltrimethoxysilane	No	NOD, UCC.
α-Methacryloxypropyltrimethoxysilane	No	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	DCC, SCM, UCC.
Tris (2-methoxyethoxy) vinyl silane	No	NOD.
Tris (pentamethyldisiloxanyl) -3-methacrylatopropylsilane	No	(2).
Vinyltriethoxysilane	No	NOD, UCC.
Vinyl trimethoxy silane	No	NOD.
All other organo-silicone compounds	No	ARO, NOD, SCM, UCC, (2).
Organo-tin compounds: Yes		
Dibutyltin bis (butylmaleate)	No	CCA.
Dibutyltin bis (isooctylmercaptoacetate)	No	WTC, (2).
Dibutyltin bis (mercaptolaurate)	No	(2).
Dibutyltin dichloride	No	WTC, (2).
Dibutyltin oxide	No	(2).
Dimethyltin dichloride	No	WTC.

See footnotes at the end of table.

Table 15-2—Continued

Miscellaneous chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1989

Miscellaneous cyclic and acyclic chemicals	Separate statistics ¹	Manufacturers' identification codes (according to list in table 15-3)
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Organo-tin compounds—Continued		
Dimethyltin-IOTG	No	WTC.
Ester tin mercaptoesters	No	CCA.
Monomethyl tin	No	WTC.
Organotin mercaptides	No	CCA, CCW.
Tin carboxylate	No	FER.
All other organo-tin compounds	No	SCM, (2), (2).
Perchloromethanethiol (Perchloromethyl mercaptan) ..	No	ICI.
Perfluoroalkyl polyether	No	DUP.
Perfluorothiois, C ₄ -C ₂₀ , gamma-omega	No	CGY.
Phosgene (Carbonyl chloride)	Yes	DUP, ICI, OMC, PPG, VDM.
Pine oil, synthetic	No	NCI.
Polyalphaolefins	No	USI.
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, OMC.
Tetrahydroalocmene hydrochloride	No	NCI.
Thioethanol, sodium salt	No	BAS.
Trifluoroethanol	No	HOC.
Zirconium compounds	No	KCH.
All other miscellaneous acyclic chemicals	Yes	ABB, ASL, CGY, EK, EKT, GPI, HMP, NOD, PAH, PIC, RCN, RSA, SCP, SHX, TCC, TNA, TSA, USR, (2), (2), (2), (2).
Mixtures not specifically itemized:	Yes	
Alcohols, monohydric, and their esters, C ₆ 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.
Methyl formcel	No	HCL, NOD.
Oxidate light ends	No	HCF.
Oxo process bottoms	No	NCI.
Propionic blends	No	HCL.
All other mixtures not specifically itemized	Yes	BAS, CGY, DUP, HCL, MON, NES, 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 15-3

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
AAC	Alcolac, Inc.	CNE	Oxy Petrochemicals, Inc.
ABB	Abbott Laboratories	CNP	DSM Chemicals, North America
AC	AC & S, Inc.	COC	Columbia Organic Chemicals Co., Inc.
ACS	Allied Signal Inc., Engineered Material Sector	CPS	CPS Chemical Co., Inc.
ACY	American Cyanamid Co.	CRZ	James River II Corp.
ADC	Anderson Development Co.	CWN	Upjohn Co., Fine Chemicals
AIP	Air Products & Chemicals, Inc.	CXI	Chemical Exchange Industries, Inc.
ALD	Aldrich Chemical Co., Inc.	CYR	CYRO Industries
ALI	Anzon, Inc.	DAN	Dan River Inc., Chemical Products Div.
ALW	Albright & Wilson, Inc.	DAZ	Diaz Chemical Corp.
AMB	American Bio-Synthetics Corp.	DCC	Dow Corning Corp.
AMO	Amoco Corp.	DIX	Dixie Chemical Co., Inc.
AMV	Amvac Chemical Corp.	DKA	Mobay Synthetics Corporation
ANG	Angus Chemical Co.	DOM	Dominion Products, Inc.
ARC	Akzo Chemicals, Inc.	DOW	Dow Chemical Co.
ARO	Arco	DPW	Deepwater, Inc.
ARS	Arsynco, Inc., Sub. Div of Aceto Corp.	DRL	Unichema North America
ART	Arlstech Chemical Corp.	DUP	E. I. duPont de Nemours & Co., Inc. Automotive Products Dept.
ARZ	Arizona Chemical Co.		Chemicals & Pigments Dept.
ASH	Ashland Oil, Inc.		Petrochemicals Dept.
ASL	Specialtychem Products Corp.		Polymer Products Dept.
ATL	Atlantic Industries, Inc.	DVC	Dover Chemical Corp. Sub. of ICC Industries, Inc.
ATR	Atlantic Richfield Co., Arco Chemical Co.	EFH	E. F. Houghton & Co.
AZT	Catalyst Resources, Inc.	EHC	Ethichem Corp.
BAS	BASF Corp.	EK	Eastman Kodak Co.:
BCC	Buffalo Color Corp.	EKT	Tennessee Eastman Co. Div.
BFG	B. F. Goodrich Co.	EKX	Texas Eastman Co. Div.
BFP	American Ingredients Company	ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.
BKC	J. T. Baker Chemical Co.	ENJ	Exxon Chemical Americas
BKM	Buckman Laboratories, Inc.	ESA	East Shore Chemical Co.
BOC	Blocraft Laboratories, Inc.	EVN	W. R. Grace & Co., Organic Chemicals Div.
BOR	Borden, Inc., Packaging & Indus. Prod. Div.		Evans Chemetics
BRD	Lonza, Inc.	FER	Ferro Corp.:
BRI	Sedgefield Specialties		Bedford Chemical Div.
BTL	BTL Specialty Resin Corp.		Grant Chemical Div.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.		Kell Chemical Div.
CAD	Akzo Chemicals, Inc.	FMB	FMC Corp., Chemical Products Group
CAS	Caschem, Inc.	FMT	Fairmount Chemical Co., Inc.
CBD	Chembond Corp.	FOC	Handschy Industries, Inc., Ink and Chemical Div.
CCA	Akzo Chemicals, Inc.	FOR	Formosa Plastics Corporation Louisiana
CCC	C. N. C. International, Inc.	FRE	Freeman Chemical Corp.
CCW	Morton International, Inc., Specialty Chemicals Group	FRO	Vulcan Materials Co., Chemicals Div.
CED	Cedar Chemical Co.	FTE	Cyprus Foote Mineral Company
CGY	Ciba-Geigy Corp.	FTX	Finetex, Inc.
CHD	Chemdesign Corp.	GAF	GAF Corp., Chemical Group
CHG	Mobay Chemical Corp., Agricultural Chemicals Div.	GAY	Gaylord Chemical Corp.
CHL	Chemol, Inc.	GE	General Electric Co., Specialty Chemical Group
CHP	C. H. Patrick & Co., Inc.	GFS	GFS Chemical, Inc.
CHT	Chattem, Inc.	GGC	Georgia-Gulf Corp.:
CJO	C. J. Osborn Chemical, Inc.		Plaquemine Div.
CMB	Cambridge Industries Co.	GIV	Givaudan Corp.

See footnotes at the end of table.

Table 15-3—Continued

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
GON	W. R. Grace & Co., Organic Chemicals Div., Nitroparaffins	MRT	Morton International, Inc., Specialty Chemical
GP	Georgia-Pacific Corp., Resins Operations	NCC	Niacet Corp.
GPI	Grindsted Products, Inc.	NCI	Unlon Camp Corp., BBA Div.
GTL	Great Lakes Chemical Corp.	NCI	Unlon Camp Corp.
HAL	C. P. Hall Co.	NES	Ruetgers-Nease Chemical Co.
HCC	Hatco Chemical Corp.	NOC	Norac Co., Inc. Mathe Div.
HCF	Cape Industries	NOD	Huls America, Inc.
HCL	Hoechst Celanese Corp: Chemical Group Inc. Fibers Industrial Division Fine Chemicals Division Sou-Tex Works	OH	Anaquest
HCP	Honig Chemical & Processing Corp.	OMC	Olin Corp.
HFT	Syntex Agribusines, Inc.	ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.
HIL	Hilton Davis Company	PAC	Pacific Anchor Chemical Corp.
HK	Occidental Chemical Corp., ED & S Div.	PAH	Parish Chemical Co.
HML	Hummel Crofton, Inc.	PAS	Atocem North America, Inc.
HMP	W. R. Grace & Co., Hampshire Chemicals Div. & Organic Chemicals Div.	PCI	Piedmont Chemical Industries, Inc.
HMV	Humphrey Chemical Co.	PD	Parke-Davis, Div. of Warner-Lambert Co.
HOC	Halocarbon Products Corp.	PDG	P. D. Glycol
HOF	Hoffman-LaRoche, Inc.	PEL	Peiron Corp.
HPC	Hercules, Inc.	PFN	Pfanstiehl Laboratories, Inc.
HRT	Hart Products Corp.	PFZ	Pfizer Pharmaceuticals, Inc.
HTM	Haltermann Ltd. Co.	PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.
HXL	Hexcel Corp., Hexcel Chemical Products	PIC	Pierce Chemical Co.
ICI	ICI Americas, Inc.: Agricultural Chemical Div. Rubicon, Inc. Specialty Chem Div.	PLC	Phillips 66 Co.
IMC	IMC Pitman-Moore Industrial Chemicals Div.	PLS	Plastics Engineering Co.
JRC	Jarchem Industries, Inc.	PMP	PMP Fermentation Products, Inc.
KCH	Manchem, Inc.	PPG	PPG Industries, Inc.
KLM	Kalama Chemical, Inc.	PSG	PMC, Inc., PMC Specialties Group, Inc.
KMI	Kernin Industries, Inc.	PST	Perstorp Polyols, Inc.
LCP	LCP Chemicals - West Virginia, Inc.	QCP	Quaker Chemical Corp.
LEM	Napp Chemicals, Inc.	QKO	QO Chemicals, Inc.
LRO	Laroche Chemicals, Inc.	QTR	Qestra Chemical, Corp.
LYP	Lyondell Petrochemical Co.	RCN	Racon, Inc.
MAL	Mallinckrodt, Inc.	RDA	Rhone-Poulenc, Inc.
MCI	Mooney Chemicals, Inc.	REG	Regis Chemical Co.
MCK	Mackenzie Chemical Works, Inc.	REZ	Hi-Tek Polymers, Inc.
MHI	Morton International, Inc., Ventron Division	RH	Rohm & Haas Co.
MIL	Milliken & Co., Milliken Chemical Div.	RPC	Colloids, Inc., Lyndal Division
MLS	Miles, Inc., Biotechnology Group	RQT	Roquette Corporation
MNA	Monsanto Agricultural Co.	RSA	R.S.A. Corp.
MON	Monsanto Co.	S	Sandoz Chemical Corp.
MRF	Morflex Chemical Company, Inc.	SBC	Scher Chemicals, Inc.
		SC	Sterling Chemicals, Inc.
		SCM	SCM Corp., PCR, Inc., & Gilco Organics
		SCN	Schenectady Chemicals, Inc.
		SCP	Henkel Corp.
		SD	Sterling Drug, Inc.: Sterling Pharmaceuticals, Inc.
		SDC	Sandoz Chemicals Corp.
		SDW	Sterling Drug, Inc. Sterling Organics Div.
		SHC	Shell Chemical Co. Div.
		SHP	Shepherd Chemical Co.

See footnotes at the end of table.

Table 15-3—Continued

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1989

Code	Name of company	Code	Name of company
SHX	Sherex Chemical Co., Inc.	UCC	Union Carbide Corp.
SK	Smithkline Beecham Chemicals	UPM	UOP, Inc.
SM	Mobil Oil Corp.: Chemical Products Div.	USB	U. S. Borax & Chemical Corp.
SOH	BP Chemicals, Inc.	USI	Quantum Chemical Corp., USI Div.
SOI	Specialty Organics, Inc.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SPD	General Electric Co., Silicone Products Div.	UTC	Unltex Chemical Corp.
SQA	Sequa Chemicals, Inc.	VCM	Vanchem, Inc.
SUN	Sun Co., Inc.	VDM	Van De Mark Chemical Co., Inc.
SWS	Wacker Silicones	VEL	Velsicol Chemical Corp.
SYL	Arizona Chemical Co.	VIK	M & T Chemical
SYP	Synthetic Products Co.	VNC	Vanderbilt Chemical Corp.
TCC	Sybron Chemicals, Inc.	VND	Van Dyk, Div. of Mallinckrodt, Inc.
TLC	Twin Lake Chemical, Inc.	VST	Vista Chemical Co.
TMH	Hacros Chemicals, Inc.	WAY	Olin Hunt Specialty Products, Inc.
TNA	Ethyl Corp.	WCC	White Chemical Corp.
TNI	Gillette Chemical Co.	WCL	Wright Chemical Corp.
TOC	Tenneco Oil Co.	WM	Inolex Chemical Co.
TRO	Troy Chemical Corp.	WPG	West Point—Pepperell, Inc., Grifftex Chemical Co. Sub.
TSA	Texae Alkyls, Inc.	WTC	Witco Chemical Corp.
TX	Texaco Chemical Co.	WTH	Unlon Camp Corp., Chemical Division
TZC	Magnesium Elektron, Inc.	WTK	Helco Chemicals, Inc.
		WVA	Westvaco Corp.

Note.—Complete names, telephone number, 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, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in 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.
AC	AC & S, Inc.	304-755-9275	P.O. Box 335, Nitro, WV 25143.
ABB	Abbott Laboratories	312-937-3452	1401 Sheridan Rd., N. Chicago, IL 60064.
ILI	Acme Steel Co	708-849-2500	13500 S. Perry Ave., Riverdale, IL 60627.
ACO	Adco Chemical Co	201-589-0880	49 Rutherford St., Newark, NJ 07105.
AIP	Air Products & Chemicals, Inc	215-481-4911	7201 Hamilton Blvd, Allentown, PA 18195-1501
AJY	Aljay Chemicals, Inc	404-943-8202	1400 Industry Rd., Powder Springs, GA 30073.
AJI	Ajinomoto USA, Inc	201-488-1212	4020 Ajinomoto Dr., Raleigh, NC 27810.
ARC	Akzo Chemicals, Inc.	312-906-7500	300 S. Riverside, Plaza Chicago, IL 60606.
CCA	Akzo Chemicals, Inc	312-906-7500	500 Jersey Ave, New Brunswick, NJ 08903.
CAD	Akzo Chemicals, Inc	312-906-7500	2153 Lockport-Olcott Rd., Burt, NY 14028.
FRP	Akzo Coatings, Inc	912-367-3616	P.O. Box 349, Baxley, GA 31513.
REL	Akzo Coatings, Inc	502-459-9110	4730 Crittenden Dr., Louisville, KY 40233.
AKZ	Akzo Coatings, Inc	502-459-9110	1313 Windsor Ave., Columbus, OH 43218.
HAN	Akzo Coatings, Inc	814-294-3361	1313 Windsor Ave., Columbus, OH 43216.
IOV	Akzo/lovite, Inc	708-481-8900	21625 Oak St., Matteson, IL 60443.
ALW	Albright & Wilson, Americas, Inc	804-550-4300	P.O. Box 26229, Richmond, VA 26229.
ALC	Alco Chemical Corp	615-629-1405	909 Mueller Dr., Chattanooga, TN 37406.
AAC	Alcolac, Inc	301-859-4900	1099 Winterson Rd., Linthicum, MD 21044.
ALD	Aldrich Chemical Co., Inc	414-273-3850	1001 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	214-733-6841	17304 N. Preston Dr., Dallas, TX 75252.
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, Corp., Friction Materials Div.	518-270-0200	P.O. Box 230, Troy, NY 12180.
ACS	Allied Signal Inc:		
	Engineered Materials Sector	201-455-4911	P.O. Box 1051 R, Morristown, NJ 07054.
	Engineered Plastic Div	201-455-3100	Columbia Rd. & Park Ave., Morristown, NY 07962.
	High Density Polyethylene Business	504-775-4330	12875 Scenic Hwy, Baton Rouge, LA 70892.
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 Island Corp.)	201-750-6000	1 Hess Plaza, Woodbridge, NJ 07095.
AMB	American Blo-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.
BFP	American Ingredients, Co	816-561-9050	3947 Broadway, Kansas City, MO 64111.
API	American Polymers, Inc	508-987-0144	Old Webster Rd., Oxford, MA 01801.
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., Havg Div	302-995-0400	900 Greenbank Rd., Wilmington, DE 19808.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
AMO	Amoco Corp	312-856-6111	200 E. Randolph Dr., 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.
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 07206.
APC	Apollo Chemical Corp	919-226-1161	1105 Southerland St., Graham, NC 27253.
APO	Apollo Colors, Inc	708-564-9190	3000 W. Dundee Rd., Suite 415, Northbrook, IL 60062.
AQU	Aqualon Co	302-996-2000	2711 Centerville Rd., Wilmington, DE 19850.
HKY	Arcadian Corp	901-758-5200	6750 Poplar Ave., Suite 600, Memphis, TN 38138-7419.
GCC	Arcadian Corp	901-758-5200	P.O. Box 27147, Memphis, TN 38127.
ARD	Ardmore, Inc	201-481-2406	29 Riverside Ave., Newark, NJ 07104.
ARN	Arenol Chemical Corp	201-526-5900	189 Meister Ave., Somerville, NJ 08876.
ART	Aristech Chemical Corp	412-433-2747	600 Grant St., Pittsburgh, PA 15230-0250.
ARZ	Arizona Chemical Co	904-785-6700	1001 E. Business Hwy. 98, Panama City, FL 32401.
SYL	Arizona Chemical Co	904-785-6700	P.O. Box 947, Port St. Joe, FL 32456.
ALS	Armco, Inc	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	333 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	904-783-5352	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 West Chester Pike, Newtown Square, PA 19073.
ARI	Atlas Refinery, Inc	201-589-2002	142 Lockwood St., Newark, NJ 07105.
RSN	Atochem North America, Inc	201-447-3300	266 Harristown Rd., Glen Rock, N.J. 07452.
PAS	Atochem North America, Inc	215-587-7452	Three Parkway, Philadelphia, PA 19102.
WTL	Atochem North America, Inc., Lucidol Div.	716-877-1740	1740 Military Rd., Buffalo, NY 14240.
AUX	Auralux Corp	203-886-2616	29 Scott Ave., Norwich, CT 06360.
AUS	Ausmont N.V	201-292-6250	128 Technology Drive, Waltham, MA 02254
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.
SOH	BP Chemicals, Inc	216-586-4141	200 Public Square 31-4105-N, Cleveland, OH 44114 - 2375.
SIF	Filon Div	213-757-5141	12333 South Van Ness Ave., Hawthorne, CA 90250.

Table A-1—Continued
Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
SIC	BP Chemicals, Inc.—Continued Silmur Div	213-757-1801	12333 South Van Ness Ave., Hawthorne, CA 90250.
SIO	BP Oil Company	419-226-2300	1150 South Metcalf St., Lima, OH 45804.
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.
BIB	Beckman Instruments, Inc	714-871-4848	1050 Page Mill Rd., Palo Alto, CA 94304.
BCK	Spincro Div. Diagnostic Systems Group	619-993-8740	2470 Faraday Ave., Carlsbad, CA 92008.
BEE	Beecham, Inc.: Beecham Laboratories Div	201-469-5200	101 Possumtown Rd., Piscataway, NJ 08854.
BEW	Pharmaceuticals Div	201-881-3000	3 Garret Mountain Plaza, West Paterson, NJ 07424.
BCM	Beiding Chemical Industries	212-544-6040	P.O. Box 130, Hendersonville, NC 28715.
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.
BNS	Binney & Smith, Inc	215-253-6271	1100 Church Lane, Easton, PA 18044-0431.
BOC	Blocraft Laboratories, Inc	201-796-3434	12 Industrial Park, Waldwick, NJ 07463.
NUT	Bloproducts, Inc	502-968-3321	4820 Jennings Lane, Louisville, KY 40218.
BOE	Boehme Filatex, Inc	919-342-6631	Rt. 11 Box 5, Reidsville, NC 27320.
BOT	Boots Co. (USA), Inc	708-405-7400	300 Tristate Int'l Ctr. Suite 200, Lincolnshire, IL 60015
BOR	Borden, Inc.: Packaging & Industrial Products Div.	614-225-4000	180 E. Broad St., Columbus, OH 43209.
BCP	Borden Chemical & Plastics Delaware Limited Partnership	504-387-5101	Route 73, Gelsmar, LA 70734.
BMC	Brlin-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.
TRD	Bristol Myers Squibb Co	212-546-4000	P.O. Box 609, Humacao, PR 00661.
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 38108.
BCC	Buffalo Color Corp	716-827-4500	P.O. Box 7027., Buffalo, NY 14240.
BRR	Burris Chemical, Inc., Color Div	803-554-7511	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	401-769-6100	20 Privledge St., Woonsocket, RI 02895.
PS	CPS Corp	716-366-6010	3257 Middle Rd., Dunkirk, NY 14048.
CPS	CPS Chemical Co., Inc	201-727-3100	Old Bridge Rd., Old Bridge, NJ 08857.
CYR	CYRO Industries	201-770-3000	100 Valley Rd., Mr. Arlington, NJ 07856.
GRL	Calgon Corp., Calgon Veetal Laboratories Div.	314-862-2000	5035 Manchester Ave., St. Louis, MO 63110.
CMB	Cambridge Industries Co	201-465-4565	7-33 Amsterdam St., Newark, NJ 07105.
HCF	Capo Industries	919-341-5500	P.O. Box 327, Wilmington, NC 28402.
SVC	Capital City Products Co	614-299-3131	1530 S. Jackson St., Janesville, WI 53545.
CBC	Carbose Corp	814-443-1611	100 Maple St., Somerset, PA 15501.

Table A-1—Continued
Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
CGL	Cargill, Inc	612-475-7634	P.O. Box 5630, Minneapolis, MN 55428.
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.
AZT	Catalyst Resources, Inc	713-957-6818	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 Corp	501-572-3701	Highway 242 South, West Helena, AR 72390.
CNT	Certaineed Corp	901-685-5348	P.O. Box 3, Vicksburg, MS 39181.
CPR	Certified Processing Corp	215-341-7000	P.O. Box 860, Valley Forge, PA 19482.
GRS	Champlin Refining Co	201-923-5200	U.S. Highway #22, Hillside, NJ 07205.
CHT	Chattem, Inc	512-882-8871	P.O. Box 9176, Corpus Christi, TX 78469.
CHD	Chemdesign Corp	615-821-4571	1715 W. 38th St., Chattanooga, TN 37409.
CFX	Chemfax, Inc	503-687-8840	1600 Valley River Dr., Suite 390, Eugene, OR 97401.
CXI	Chemical Exchange Industries, Inc	508-345-9999	99 Development Rd., Fitchburg, MA 01420.
CMT	Chemithon Corp	601-863-6511	10045 Three River Rd., Gulfport, MS 39503.
CHL	Chemol Co	713-526-8291	3813 Buffalo Speedway, Houston, TX 77098.
SOC	Chevron Corp., Chevron Chemical	206-937-9954	5430 Marginal Way, SW., Seattle, WA 98106.
CHH	Chris Hansen's Laboratory, Inc	415-842-5500	2410 Randolph Ave., Greensboro, NC 27406.
CMC	Chromatic Color Corp	414-476-3630	6001 Bollinger Canyon Rd., San Ramon, CA 94583.
CGY	Ciba-Geigy Corp	414-476-3630	9015 W. Maple St., West Allis, WI 53214.
FJI	Cincinnati Varnish Co	502-737-1700	305 Ring Rd., Elizabethtown KY, 42701.
CGO	Citgo Petroleum Corp	914-478-3131	444 Saw Mill River Rd., Ardsley, NY 10502.
CGU	Citizens Gas & Coke Utility	513-631-4270	1776 Mentor Ave., Cincinnati, OH 45212.
ACT	Climax Performance Materials Corp	918-495-4000	P.O. Box 1562, Lake Charles, LA 70602.
WYC	Coastal Chem, Inc	317-264-8802	3133 Southeastern Ave., Indianapolis, IN 46203.
CSP	Coastal Refining & Marketing Inc	708-458-8450	7666 W. 63rd St., Summit, IL 60501.
CP	Colgate-Palmolive Co	307-637-2700	P.O. Box 1287, Cheyenne, WY 82003.
CLD	Colloids, Inc	713-877-1400	Nine Greenway Plaza, Houston, TX 77046.
RPC	Lyndal Div	212-310-2000	300 Park Ave., New York, NY 10022.
CIC	Color Chem International Corp	201-926-6100	P.O. Box 769, Marietta, GA 30061.
CCS	Colorado Chemical Specialties, Inc	404-259-4831	1338 Coronet Drive, Daiton, Ga. 30720
CRS	Colorado Resins, Inc	201-444-8563	7 Plymouth Rd., Glen Rock, NJ 07452.
CNC	Columbia Nitrogen Corp	303-245-8148	569 24-1/4 Rd., Grand Junction, CO 81505.
COC	Columbia Organic Chemical Co., Inc	303-245-8148	569 24-1/4 Rd., Grand Junction, CO 81505.
CAC	Cominco Fertilizers Inc	404-823-4300	P.O. Box 1483, Augusta, GA 30903.
CMP	Commercial Products Co., Inc	803-425-1786	1424 Mt. Zion Road, Cassatt SC 29032.
CNI	Conap, Inc	509-747-6111	W. 818 Riverside Ave., Spokane, WA 99201.
CON	Concord Chemical Co., Inc	201-427-6887	117 Ethel Ave., Hawthorne, NJ 07506.
CO	Conoco Specialty Products, Inc	716-372-9650	1405 Buffalo St., Olean, NY 14760.
CTL	Continental Chemical Co	609-966-1526	17th & Federal Sts., Camden, NJ 08105.
		713-293-1000	600 N. Dairy Ashford Rd., Houston, TX 77079.
		201-472-5000	270 Clifton Blvd., Clifton, NJ 07011-3686.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Ident- fication code	Name of company	Telephone number	Office address
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.
HEU	Cookson Pigments, Inc	201-242-1800	256 Vanderpool St., Newark, NJ 07114.
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.
CMS	Cosmic Plastics, Inc	818-365-3249	12314 Gladstone Ave., San Fernando, 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.
FTE	Cyprus Foote Mineral Co	215-889-9605	301 Lindenwood Dr., Suite 301, Malvern, PA 19355.
CNP	DSM Chemicals North America, Inc	404-823-4240	P.O. Box 2451, Augusta, GA 30903.
POP	Dalcolor Papa, Inc	201-279-2702	33 Sixth Ave., Paterson, NJ 07524.
MAR	Dalshowa Chemical, Inc	203-625-0701	81 Holly Hill Lane Greenwich, CT 06830.
DAN	Dan River, Inc., Chemical Products Div	804-799-7000	State Route 360 East, Danville, VA 24543.
DPI	Dart Polymers, Inc., Sub. of Dart Container Corp.	517-678-3800	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	201-641-8100	65 Challenger Rd., Ridgefield Park, NJ 07880.
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.
DSO	DeSoto, Inc	312-391-9000 708-757-5100 708-391-9000	1608 4th St., Berkeley, CA 94710, and 300 State St., Chicago Heights, IL 60411 and P.O. Box 481268, Garland, TX 75046.
UDI	DeSoto, Inc	708-391-9000	3950 Fossil Creek Blvd., Fort Worth, TX 76137.
PLX	Union City	312-391-9000	1700 So. Mt. Prospect Rd., Des Plaines, IL 60018
DTR	Detroit Coke Corp	313-842-6222	7819 West Jefferson Ave., Detroit, MI 48209.
	Dexter Corp:		
HYA	Dexter Adhesive & Structural Material Div.	415-687-4201	2850 Willow Pass Road, Pittsburgh, CA 94565.
HYC	Dexter Electronic Material Div	818-968-6511	15051 E. Don Julian Rd., Industry, CA 91749.
MID	Dexter Specialty Coatings	708-623-4200	E. Water St., Waukegan, IL 60085.
DEX	Dexter Chemical Corp	212-542-7700	845 Edgewater Rd., Bronx, NY 10474.
AGP	Dial Corp	602-246-2800	2000 Aucutt Rd., Montgomery, AL 36038.
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.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identification code	Name of company	Telephone number	Office address
PLN	Disogra Industries Corp	603-669-4050	Grenier Industrial Airpark, Manchester, NH 03103.
DIX	Dixie Chemical Co., Inc	713-863-1947	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 Industries, Inc.	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.
DRX	Drexel Chemical Corp	901-774-4370	2487 Pennsylvania St., Memphis, TN 38109.
ABP	Drummond Co., Inc	205-945-6301	P.O. Box 10246, Birmingham, AL 35202.
WBG	Dryden Oil Co., White & Bagley Div	508-791-3201	688-692-Millbury St., Worcester, MA 01607.
CHO	Ducon	618-654-2070	180 Woodcrest Dr., Highland, IL 62249.
DUP	E. I. duPont de Nemours & Co., Inc	302-774-1000	1007 Market St., Wilmington, DE 19898.
DSC	Dye Specialties, Inc	201-866-9504	100 Plaza Center, Secaucus, NJ 07096.
AGI	EMS-American Grilon, Inc	803-481-9173	P.O. Box 1717, Sumter, SC 29151.
EPC	EPC Partners, Ltd	713-880-6500	P.O. Box 4324, Houston, TX 77210.
EPI	Eagle Pitcher Industries Inc., Orthane Div.	817-387-0585	P.O. Box 1389, Denton, TX 76202.
ECC	Eastern Color & Chemical Co	401-331-9000	35 Livingston St., Providence, RI 02904.
EK	Eastman Kodak Co	718-724-4000	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, Longview, TX 75607.
ESA	East Shore Chemical Co.	616-726-3106	1221 E. Barney Ave., Muskegon, MI 49443.
ELI	Ecolab Inc	612-293-2233	Ecolab Center, St. Paul, MN 55102.
ELN	Elan Chemical Co	201-344-8014	268 Doremus Ave., Newark, NJ 07105.
ELC	Eico Corp. Sub. of Detrex Chemical Industries, Inc.	216-749-2605	1000 Beltline Rd., Cleveland OH 44109.
USM	Emhart Corp., Bostik Div	508-777-0100	Boston St., Middleton, MA 01949.
EMK	Emkay Chemical Co	201-352-7053	319-325 Second St., Elizabeth, NJ 07206.
EKO	Empire Coke Co	205-323-2400	1927 1st Ave., N., Suite 900, Birmingham, AL 35203.
ENO	Enenco, Inc	901-328-5800	755 Crossover Lane, Suite 218, Memphis, TN 38117.
HSH	Engelhard Corp	201-632-6000	3400 Band Street, Louisville, KY 40212.
SAR	Esschem, Inc	215-521-3800	Governor Printz Blvd., Essington, PA 19029.
ESS	Essential Industries, Inc	414-538-1122	28391 Essential Rd., Merton, WI 53056.
EHC	Ethichem 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.
EVL	Eval Company of America	708-719-4610	1001 Warrenville Rd., Suite 201, Lisle, IL 60532.
ENJ	Exxon Chemical Americas	713-870-6000	P.O. Box 3272, Houston, TX 77253-3272.
	FMC Corp:		
FMN	Agricultural Chemical Group	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMB	Chemical Products Group	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMC	Nitro Div	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FAB	Fabricolor Manufacturing Corp	201-742-3900	24-1/2 Van Houten St., Paterson, NJ 07509.
FMT	Fairmount Chemical Co., Inc	201-344-5790	117 Blanchard St., Newark, NJ 07105.

Table A-1—Continued
Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
FRI	Farmland Industries, Inc	816-459-6000 816-238-8111	P.O. Box 308, Lawrence, KS 66044. 1417 Lower Lake Rd., St. Joseph, MO 64502.
FEL	Felton Worldwide, Inc	718-497-4664	599 Johnson Ave., Brooklyn, NY 11237.
SDS	Fermenta ASC Corp	216-357-4100	5966 Helsey Rd., Mentor, OH 44060.
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.
	Kell 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 Expressway, 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, Princeton, NJ 08543.
FST	First Chemical Corp	601-762-0870	P.O. Box 1427, Pascagoula, MS 39567.
FPC	Flambeau Paper Corp	715-762-5235	200 N. First Ave., Park Falls, WI 54552.
FLM	Fleming Laboratories, Inc	704-372-5613	2215 Thrift Rd., Charlotte, NC 28234.
CIK	Filint Ink Corp., Cal/Ink Div	415-525-1188	1404 - 4th St., Berkeley, CA 94710.
FMX	Foamex Products, Inc., Div. of Knoll Int'l Holdings, Inc.	803-576-1210	P.O. Box 188, Cornelius, NC 28031.
FOR	Formosa Plastics Corp.-Louisiana Formosa Plastics Corp.-USA	504-356-3341 201-966-6980	P.O. Box 271, Baton Rouge, LA 70821. 66 Hanover Rd., Florham Park, NJ 07932.
BDS	Fragrance Resources, Inc	201-264-6767	275 Clark St., Keyport, NJ 07735.
FLN	Franklin International, Inc	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	201-929-4100	76 - 9th Ave., New York, NY 10011.
COO	H.B. Fuller Co	508-658-3351	820 Woburn St., Wilmington, MA 01887.
FLH	H.B. Fuller Co	612-645-3401	4450 Malsbary Rd., Blue Ash, OH 45242.
EFP	Furon Co	714-831-5350	Maln & Orchard Sts., Mantua, OH 44255.
GAF	GAF Chemical Corp	201-628-3000	1361 Alps Rd., Linden, NJ 07036.
GFS	GFS Chemicals, Inc	614-881-5501	P.O. Box 245, Columbus, OH 43065.
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	Gaylor Chemical Corp	504-649-5464	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.
	General Electric Co.:		
GE	Electromaterials Div	614-622-5310	1350 S. Second St., Coshocton, OH 43812.
GEP	Plastics Div	413-448-7110	1 Plastics Ave., Pittsfield, MA 01201.
SPD	Silicone Products Div	518-237-3330	Waterford-Mechanicville Rd., Waterford, NY 12188.

Table A-1—Continued
 Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
GE	General Electric Co—Continued Specialty Chemicals Group	413-448-6394	Parkersburg Center, 5th & Avery, Parkersburg, WV 26102.
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	713-473-4453	3503 Pasadena Freeway, Pasadena, TX 77503.
	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	404-521-4600	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	Gildden 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	3760 S. Highland Dr., Suite 500, Salt Lake City, UT 84106.
GYR	Goodyear Tire & Rubber Co W. R. Grace & Co.:	216-796-2121	1144 E. Market St., Akron, OH 44316.
EVN	Organic Chemicals Div., Evans Chemetics.	617-861-6600	55 Hayden Ave., Lexington, MA 02173.
GRD	Organic Chemicals Div., Chemicals & Polymers Div.	617-861-6600	55 Hayden Ave., Lexington, MA 02173.
HMP	Organic Chemicals Div., Hampshire Chemicals Div.	617-861-6600	55 Hayden Ave., Lexington, MA 02173.
CON	Organic Chemicals Div., Nitroparaffins.	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	U.S. Hwy. 52 NW., Lafayette, IN 47906.
GNW	Greenwood Chemical Co	703-456-6832	State Hwy. #690, Greenwood, VA 22943.
GDC	Greco, 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, KS 66031.
GGI	Grow Group, Inc	301-939-1234	1354 Old Post Rd., Havre De Grace, MD 21078.
GRV	Guardsman Products, Inc	616-452-5181	1350 Steele Ave. SW., Grand Rapids, MI 49507.
GSS	Gulf States Steel, Inc	205-543-6201	174 South 26th St., Gadsden AL 35904-1935.
GTH	Guth Corp	414-644-6461	P.O. Box 347, Slinger, WI 53086.
HAR	Haarmann & Reimer Corp	201-467-5600	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	713-452-5951	16717 Jacintoport Blvd., Houston, TX 77015.
FOC	Handschy Industries, Inc Ink and Chemical Div	708-597-7990	13601 S. Ashland Ave., Riverdale, IL 60627-1099.

Table A-1—Continued
 Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
TMH	Harcros 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.
WTK	Helco Chemicals, Inc	717-476-0353	Route 611, Delaware Water Gap, PA 18327.
HAP	Helmerich & Payne, Inc., Natural Gas Odorizing Div.	713-424-5568	3601 Decker Dr., Baytown, TX 77520.
SCP	Henkel Corp	215-270-8100	2200 Renaissance 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.
HEC	Hewchem	601-863-8600	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	3547 Old 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.
SOG	Hill Petroleum Company	203-661-4770	P.O. Box 5038, Houston, TX 77262-5038.
HIL	Hilton Davis Chemical Co	513-841-4000	2335 Langdon Farm Rd., Cincinnati, OH 45237.
HIM	Himont, USA, Inc	302-996-6000	P.O. Box 15439, Wilmington, DE 19894.
BEZ	Hi-Tek Polymers	502-499-4011	9808 Bluegrass Parkway, Louisville, KY 40299.
HDG	Hodag Chemical Corp	312-675-3950	7247 N. Central Park Ave., Skokie, IL 60076.
HCL	Hoechst Celanese Corp: Bayport Works, SP & W Div	713-474-6737	P.O. Box 58160, Houston, TX 77258.
	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 Industrial Div	803-579-5505	P.O. Box 5887, Spartanburg, SC 29304-5887.
	Fine Chemical Div	804-393-3100	801 Water St., Portsmouth, VA 23704.
	SpecialtyChem Group Coventry Plant.	201-231-2000	500 Washington St., Coventry, RI 02816.
	Sou-Tex	201-231-2000	P.O. Box 866, Mt. Holly, NC 28120.
HOF	Hoffmann-LaRoche, Inc	201-235-5000	340 Kingsland St., Nutley, NJ 07110.
HCP	Honig Chemical & Processing Corp	201-344-0881	414 Wilson Ave., Newark, NJ 07105.
EFH	E. F. Houghton & Co	215-666-4000	P.O. Box 930, Valley Forge, PA 19482.
NOD	Hule America, Inc	201-981-5000	80 Centennial Ave., Piscataway, NJ 08855-0456.
HML	Hummel Croton, Inc	201-754-1800	10 Harmich 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 Americas, Inc: Agricultural Products Div	302-886-8000	Delaware Corp. Center, Wilmington, DE 19897.
	Films Group Div	302-886-3793	Concord Pike & Murphy Rd., Wilmington, DE 19897.
	Polyurethanes Group	609-423-8300	Mantua Grove Rd., W. Deptford, NJ 08066.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report.)

Identifi- cation code	Name of company	Telephone number	Office address
	<i>ICI Americas, Inc.—Continued</i>		
	Resin Div	508-658-6600	730 Main St., Wilmington, MA 01887.
	Specialty Chemicals Div	302-886-3000	Concord Pike & Murphy Rd., Wilmington, DE 19897.
IMC	IMC Pittman-Moore, Inc	812-232-0121	P.O. Box 207, Terre Haute, IN 47808.
	Industrial Chemical Div	708-815-3700	421 E. Hawley St., Mundelein, IL 60060.
ISP	INSPEC Chemical Corp	412-765-1200	411 Seventh Ave., Pittsburgh, PA 15219
IND	Indol Color Co., Inc	201-242-1300	1029 Newark Ave., Elizabeth, NJ 07201.
IDC	Industrial Color, Inc	815-722-7402	50 Industry Ave., Joliet, IL 60435.
INL	Inland Steel Co	312-346-0300	3210 Watling, St., E. Chicago, IL 46312.
WM	Inolex Chemical Co	215-271-0800	Jackson & Swanson Sts., Philadelphia, PA 19148.
SPC	Inslco Corp., Sinclair Paint Co. Div	213-888-8888	6100 South Garfield Ave., Los Angeles, CA 90040.
IMI	Insulating Materials, Inc	518-395-3300	1 Campbell Rd., Schenectady, NY 12306.
GBF	International Bio-Synthetics Inc	704-527-9000	P.O. Box 241068, Charlotte, NC 28224-1068.
IFF	International Flavor & Fragrances Inc	201-264-4500	1515 Highway #36, Union Beach, NJ 07735.
IPC	Interplastic Corp	812-331-6850	2015 NE Broadway, Minneapolis, MN 55413.
CRZ	James River II, Inc	804-844-5411	4th & Adams Sts., Camas, WA 98607.
JRC	Jarchem Industries, Inc	201-344-0600	40 Ball St., Newark, NJ 07105.
JFR	George A. Jeffreys & Co., Inc	703-389-8220	P.O. Box 909, Salem, VA 24153.
JRG	Andrew Jergens Co	513-421-1400	2535 Spring Grove Ave., Cincinnati, OH 45214.
JTO	Jetco Chemicals, Inc	214-872-3011	P.O. Box 1898, Corsicana, TX 75110.
MRX	Johnson Matthey, Inc	215-648-8000	2001 Nolte Dr., W. Deptford, NJ 08066.
JNS	S. C. Johnson & Son, Inc	414-631-2000	1525 Howe St., Racine, WI 53403.
JOB	Jones-Blair Co	214-353-1600	2728 Empire Central, Dallas, TX 75045.
KLM	Kalama Chemical, Inc	206-682-7890	Bank of California Center, Suite 1110, Seattle, WA 98164.
KTP	Kama Corp	717-455-2022	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	Keysor 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	318-832-5500	P.O. Box 2302, Wichita, KS 67201.
KPT	Koppers Industries, Inc	412-227-2001	436 Seventh Ave., Pittsburgh, PA 15219-1800.
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.

Table A-1—Continued
 Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identification code	Name of company	Telephone number	Office address
LKY	Lake States Div. of Rhinelander Paper Co.	715-369-4217	515 W. Davenport St., Rhinelander, WI 54501.
LRO	LaRoche Chemical, Inc.	504-356-8406	P.O. Box 1031, Baton Rouge, LA 70821.
ARM	LaRoche Industries Inc.	404-851-0475	1100 Johnson Ferry Rd., Atlanta GA 30342.
LII	Lawter International, Inc.	708-498-4700	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	2820 N. Normandy Dr., 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	Eli Lilly & Co.	317-276-2000	Lilly Corporate Center, Indianapolis, IN 46285.
	Eli 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, Inc.	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.
STG	McCormick & Co., Inc., McCormick- Stange, Flavor Div.	301-771-7401	230 Schilling Circle S., Hunt Valley, MD 21031.
MGK	McLaughlin Gormley King Co.	612-544-0341	8810 - 10th Ave. N., Minneapolis, MN 55427-4372.
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.
SOR	MW Manufacturers, Inc., Southern Resin Div.	919-475-1348	P.O. Box 68, Thomasville, NC 27360.
VIK	M & T Chemicals, Inc.	201-499-2110	P.O. Box 1104, Rahway, NJ 07065-0970.
MCK	MacKenzie Chemical Works, Inc.	504-886-2173	78015 Chemical Rd., Bush, LA 70431.
TZC	Magnesium 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	Mariowé-Van Loan Corp.	919-886-7126	1511 Joshua Circle, High Point, NC 27260.
MCA	Masonite Corp., Alpine Resin Div.	601-849-6000	P.O. Box 1048, Laurel, MS 39440.
MAX	Max Marx Color Corp.	201-373-7801	1200 Grove St., Irvington, NJ 07111.
MYO	Mayo Chemical Co.	404-696-6711	554 Oakdale Rd., Smyrna, GA 30082.
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 Inc., Blotechnology Products Div.	219-262-6916	1127 Myrtle St., Elkhart, IN 46515.
MIL	Milliken & Co., Milliken Chemical Div.	803-472-9041	P.O. Box 817, Inman, SC 29349.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Ident- fication code	Name of company	Telephone number	Office address
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	Dyes & Pigments Div.	412-777-2000	Mobay Road, Pittsburgh, PA 15205-9741.
MOB	Pittsburgh Div.	412-777-2000	Mobay Road, Pittsburgh, PA 15205-9741.
DKA	Mobay Synthetics Corp.	713-477-8821	8701 Park Place Blvd., Houston TX 77017.
SM	Mobil Oil Corp.:		
	Beaumont Refinery Div.	703-846-3000	3225 Gallows Rd., Fairfax, VA 22037.
	Gas Liquids Dept.	703-849-3000	P.O. Box 900, Dallas, TX 75221.
	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.
	Polystyrene Business Group.	201-321-6000	P.O. Box 3029, Edison, NJ 08818.
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 29301.
MRF	Morflex, Inc.	919-292-1781	2110 High Point Road, Greensboro, NC 27403.
	Morton International Inc.:		
PYI	Morton Chemical Div.	312-807-2000	Mountain Creek Church Rd., Greenville, SC 29602.
MRT	Specialty Chemicals Group.	312-807-2000	333 W. Wacker Dr. Chicago, IL 60606.
CCW	Specialty Chemicals Group.	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	3699 Kinsman Blvd., Madison, WI 53704.
RTC	Mount Vernon Mills, Inc.	803-233-4151	P.O. Box 2476, Greenville, SC 29602.
PNX	The Murphy-Phoenix Co.	216-831-0404	25800 Science Park Dr., Suite 200, Beechwood, OH 44122.
NTL	NL Chemicals, Inc.	609-443-2000	P.O. Box 700, Hightstown, NJ 08520.
NMC	NAMICO, Inc.	215-482-6600	4601 Flat Rock Rd., Philadelphia, PA 19127.
LEM	Napp Chemicals, Inc.	201-773-3900	199 Main St., Lodl, NJ 07644.
NTC	National Casein Co.	312-846-7300	601 W. 80th St., Chicago, IL 60620.
NCJ	National Casein of New Jersey.	312-846-7300	601 W. 80th St., Chicago, IL 60620.
NSC	National Starch & Chemical Corp.	201-685-5000	10 FINDERNE AVE., BRIDGEWATER, NJ 08807.
NTS	National Steel Corp., Great Lakes Div.	313-297-2100	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.	818-334-2908	405 S. Motor Ave., Azusa, CA 91702.
	Mathe Div.	201-779-4981	169 Kennedy Dr., Lodl, NJ 07644-0230.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

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Identification code	Name of company	Telephone number	Office address
FSN	NOR-AM Chemical Co	302-575-2000	3509 Silverside Road, Wilmington, DE 19810.
NW	Northwestern Chemical Co	312-231-6111	120 N. Aurora St., W. Chicago, IL 60185.
NOR	Norwich Eaton Pharmaceutical, Inc	607-335-2049	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 Lake Cook Rd., Deerfield, IL 60015.
OBC	The O'Brien Corp	415-871-2300	450 E. Grand Ave., S. San Francisco, CA 94080.
	Occidental Chemical Corp.:		
HKD	Durez Div	716-698-6000	Walck Rd., N. Tonawanda, NY 14120.
HK	ED & S Div	214-404-3300	5005 LBJ Freeway, Dallas, TX 75244.
HXP	Polymer & Plastics Div	215-251-1000	P.O. Box 1772, Berwyn, PA 19312.
OMC	Olin Corp	203-356-2000	120 Long Ridge Rd., Stamford, CT 06904.
WAY	Olin Hunt Specialty Products, Inc	201-977-6000	One Wellington Rd., Lincoln, RI 02865.
OC	Omega Chemicals, Inc	803-582-5348	P.O. Box 1723, Spartanburg, SC 29304
ORG	Organics/LaGrange, Inc	312-764-6700	7125 N. Clark St., Chicago, 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.
CNE	Oxy Petrochemicals, Inc	713-623-2246	5 Greenway Plaza, Suite 2500, Houston, TX 77046.
PBI	PBI-Gordon Corp	816-421-4070	1217 W. 12th St., Kansas City, MO 64101-1407.
PDG	PD Glycol	409-838-4521	P.O. Box 3785, Beaumont, TX 77704.
PSG	PMC Inc., PMC Specialties 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.
PAC	Pacific Anchor Chemical Corp	213-725-1800	5701 S. Eastern Ave. Suite 530, Los Angeles, CA 90040.
PRA	Para-Chem. Southern Inc	803-967-7691	P.O. Box 127, Simpeonville, 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 2528, Greenville, SC 29602.
PEL	Peirson Corp	708-442-9100	7847 W. 47th St., Lyons, IL 60534.
PEN	Penick Corp	201-621-2804	158 Mount Olive Ave., Newark NJ 07714
PAR	Pennzoll Products Co., Penreco Div	713-337-1534	4401 Park Ave., Dickinson, TX 77539.
BPT	Permuthane Coatings, Inc	508-531-1880	13 Corwin St., Peabody, MA 01960.
PST	Perstorp Compounds, Inc	413-584-2472	238 Nonotuck St., Florence, MA 01060.
PST	Perstorp Polyolef, Inc	419-729-5448	600 Matzinger Rd., Toledo, OH 43612.
PFN	Planstiehl Laboratories, Inc	708-623-0370	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.
PHR	Pfizer Pharmaceuticals, Inc	809-846-4300	P.O. Box 628, Barceloneta, PR 00617.
PHR	Pharmachem Corp	215-867-4654	719 Stefko Blvd., Bethlehem, PA 18016.
PLB	Pharmacia P-L Blochemicals, Inc	414-227-3600	2202 N. Bartlett Ave., Milwaukee, WI 53202.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

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Identifi- cation code	Name of company	Telephone number	Office address
PDI	Pheips Dodge Industries, Inc Pheips Dodge Magnet Wire Co.	219-456-4444	4300 New Haven Ave., Fort Wayne, IN 46803.
PLC	Phillips 66 Co	918-661-6600	Phillips Bldg., Bartlesville, OK 74004.
PPX	Phillips Paraxylene, Inc	809-864-1515	P.O. Box 1162, Guayama, PR 00655.
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. Meridan Rd., Rockford, IL 61103.
PIL	Pilot Chemical Co	213-723-0036	11756 Burke St., Santa Fe Springs, CA 90670.
PPL	Pioneer Plastics Corp	207-784-9111	1 Plonite Rd., Auburn, ME 04210.
PKL	Plaskolite, Inc	614-294-3281	P.O. Box 1497, Columbus, OH 43216.
PSL	Plaskok 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.
RCD	Polysar, Inc	203-934-6315	17 Woodland, Rd., Madison, CT 06443.
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	890 Fern Hill Rd., West Chester, PA 19380.
PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.	513-627-6386	Spring Grove & June St., St. Bernard, OH 45217.
PRC	Products Research & Chemical Corp.	818-240-2060	5430 San Fernando Rd., Glendale, CA 91209.
QKO	QO Chemicals, Inc	317-497-6110	2801 Kent Ave., W. Lafayette, IN 47906.
QCP	Quaker Chemical Corp	215-828-4250	Elm & Lee Ste., Conshohocken, PA 19428-0809.
USI	Quantum Chemical Corp., USI Div.	513-530-6580	11500 Northlake Dr., Cincinnati, OH 45249.
QTR	Questra Chemicals Corp	404-434-1333	2859 Paces Ferry Rd., Atlanta, GA 30339.
QUN	K. J. Quinn & Co., Inc	817-474-7177	135 Folly Mill Rd., Seabrook, NH 03874.
AMU	RPM American Emulsions Co., Inc	404-226-7028	1202 Dozier St., Dalton, GA 30721.
RSA	R.S.A. Corp	914-693-1818	690 Saw Mill River Rd., Ardsley, NY 10502.
RCN	Racon, Inc	318-524-3245	6040 S. Ridge Rd., Wichita, KS 67201.
BLC	Ranbar Technology, Inc	412-486-1111	1114 William Flinn Highway, Glenshaw, PA 15116.
RAY	Rayonier Chemical Products, Inc	203-348-7000	P.O. Box 68967, Seattle, WA 98188.
RAB	Raytech Corp	203-371-0101	1204 Darlington Ave., Crawfordsville, IN 47933.
RBI	Reeves Brothers, Inc	803-576-1210	P.O. Box 3127, Spartanburg, SC 29304.
REG	Regie Chemical Co	708-967-6000	8210 Austin Ave., Morton Grove, IL 60053.
RCI	Reichhold Chemicals, Inc	914-682-5700	800 Callota Dr., Research Triangle Park, Durham, NC 27713.
RIL	Reilly Industries, Inc	317-247-8141	1510 Market Square Center, Indianapolis, IN 46204.
CRT	Reilly-Whiteman, Inc	215-423-5300	801 Washington St., Conshohocken, PA 19428.
LUR	Reilly-Whiteman, Inc	215-423-5300	2600 E. Tioga St., Philadelphia, PA 19134.
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.

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Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identification code	Name of company	Telephone number	Office address
AMS	Ridgway Color Co	513-771-1900	410 Glendale-Milford Rd., Cincinnati, OH 45215.
RIK	Riker Laboratories, Inc., Sub. of 3M Co	818-341-1300	19901 Nordhoff St., Northridge, CA 91324.
RIV	Riverdale Chemical Co	708-754-3330	220 E. 17th St., Chicago Heights, IL 60411-3699.
ROB	Robeco Chemicals, Inc	212-986-6410	99 Park Ave., New York, NY 10016.
ORT	Rohr Chemicals, Inc. Div. of Aceto Corp	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.
DRB	Rohm Tech, Inc	508-342-5831	119 Authority Dr., Fitchburg, MA 01420.
ROM	Roma Color, Inc	617-676-3481	749 Quequechan St., Fall River, MA 02723.
RQT	Roquette Corp	708-249-5950	1550 Northwestern Ave., Gurnee, IL 60031-2392.
RUC	Rubicon, Inc	504-673-6141	P.O. Box 517, Gelsmar, 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 48602.
SCM	SCM Corp.: Gildco Organica PCR, Inc	904-768-5800 904-376-8246	P.O. Box 389, Jacksonville, FL 32201. P.O. Box 1466, Gainesville, FL 32609.
SOS	SSC Industries, Inc	404-762-9651	1550 E. Taylor Ave., East Point, GA 30344.
NPR	Safeway, 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 Sandoz Chemical Corp.:	508-745-0585	60 Grove St., Salem, MA 01970.
S	Sandoz Chemical Corp	704-331-7016	4000 Monroe Rd., Charlotte, NC 28205.
SDC	Sandoz Chemical Corp	704-331-7016	4000 Monroe Rd., Charlotte, NC 28205.
ZOC	Sandoz Corp. Protection	312-699-1616	1300 E. Touly Ave., Des Plaines, IL 60018.
SCN	Schenectady Chemicals, Inc	518-370-4200	Congress & 9th Sts., Schenectady, NY 12306.
SBC	Scher Chemicals, Inc	201-471-1300	Industrial West, Clifton, NJ 07012.
SCH	Schering Corp	201-298-4000	1011 Morris Ave., Union, NJ 07081.
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	708-982-7000	5200 Old Orchard Rd., Skokie, IL 60077.
BRI	Sedgfield Specialities	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	713-241-9548	P.O. Box 3105, Houston, TX 77253.
SHC	Shell Chemical Co	713-241-9548	P.O. Box 3105, Houston, TX 77253.
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.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
	The Sherwin-Williams Co.:		
SW	Sherwin-Williams Co	216-566-2000	11541 S. Champlain, Chicago, IL 60628.
SW	Sherwin-Williams Co	216-566-2000	Boggs Lane South, Richmond, KY 40475.
SW	Sherwin-Williams Co	216-566-2000	2802 W. Miller Rd., Garland TX 75041.
BAL	Consumer Div	301-625-8284	2325 Hollins Ferry Rd., Baltimore, MD 21230.
SHT	Shintech, 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 Inc	205-254-7801	3500 - 35th Ave., Birmingham, AL 35207.
SK	SmithKline Beechman Chemicals	215-751-4000	One Franklin Plaza, Philadelphia, PA 19101.
SMO	Smooth-On, Inc	201-647-5800	1000 Valley Rd., Gillette, NJ 07933.
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, 2000 Rockford Rd., Charles City, IA 50616.
SAL	Solvay Animal Health, Inc	515-257-2422	815-D Virginia St., SW., Lenoir, NC 28645.
SAC	Southeastern Adhesives	704-754-3493	P.O. Box 9217, Corpus Christi, TX 78469.
SWR	Southwestern Refining Co., Inc	512-884-8863	310 Wheeler St., Tonawanda, NY 14150.
SPL	Spaulding Composites Co	716-692-2000	2 Stanton St., Marlton, NJ 54143.
ASL	SpecialtyChem Products Corp	715-735-9033	5623 N. 4th St., Irwindale, CA 91706.
SOI	Specialty Organics, Inc	818-962-2008	200 Sheridan Ave., Paterson, NJ 07512.
IPP	Spectrachem Corp	201-595-8181	1035 Belleville Turnpike, Kearny, NJ 07032.
SCC	Standard Chlorine of Delaware, Inc	201-997-1700	22500 Millsdale Rd., Elwood, IL 60421 and 100 W. Henter Ave., Maywood, NJ 07607.
STP	Stepan Co	815-727-4944	201 Bay St. South, Texas City, TX 77592-1311.
SC	Sterling Chemicals, Inc	409-942-3360	2144 E. State St., Trenton, NJ 08619.
SD	Sterling Drug, Inc	212-907-2000	P.O. Box 11247, Barcelonita, PR 00617.
SDW	Sterling Organics Div	212-907-2000	90 Park Ave., New York, NY 10016.
CIN	Stockhausen, Inc	919-333-3500	2408 Doyle St., Greensboro, NC 27406.
IRI	Stuart-Ironides, Inc	708-655-4595	7575 Plaza Court, Willowbrook, IL 60521
SUN	Sun Company, Inc	215-977-6358	1801 Market St., Philadelphia, PA 19103.
SNA	Sun Chemical Corp., Pigments Div	212-986-5500	411 Sun Ave., Cincinnati, OH 45232.
RAS	Surface Coatings, Inc	617-933-4200	100 Eames St., Wilmington, MA 01887.
TCC	Sybron Chemical, Inc	609-893-1100	P.O. Box 66, Birmingham Rd., Birmingham, NJ 08011.
INP	Synair Corp	615-698-8801	2003 Arnicaola Hwy., Chattanooga, TN 37406.
BUC	Synalloy Corp., Blackman Uhler	803-585-3661	Croft Industrial Park, Spartanburg, SC 29304.
SRV	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 65810.
SYF	Synthetic Products Co	216-531-6010	1000 Wayside Rd., Cleveland, OH 44110.
SYT	Synthron, Inc	704-437-8611	P.O. Box 1111, Morganton, NC 28655.
TKD	Takeda Chemical Products USA, Inc	919-762-8666	P.O. Box 2577, Wilmington, NC 28402.
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, Tenneco Methanol Co	713-757-2131	1010 Milan St., Houston, TX 77252.
TEN	Tennessee Chemical Co	615-496-3331	1 Cocee St., Copperhill, TN 37317.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identifi- cation code	Name of company	Telephone number	Office address
TVA	Tennessee Valley Authority, NFDC, TVA, OACD, Div. of Developmental Production.	205-386-3521	Muscle Shoals, AL 35660.
TER	Terra International, Inc	712-277-1340	Terra Centre, 600 - 4th St., Sloux City, IA 51101.
TER	Terra International, Inc	712-277-1340	1000 Terra Dr., Woodward, OK 73801.
TX	Texaco Chemical Co	713-432-3734	3040 Post Oak Rd., Houston, TX 77056.
TSA	Texas Alkyls, Inc	713-479-8411	P.O. Box 600, Deer Park, TX 77536.
TPC	Texas Petrochemicals Corp	713-477-9211	8600 Park Place Blvd., Houston, TX 77017.
TWD	Tonawanda Coke Corp	716-876-6222	P.O. Box 5007, Tonawanda, NY 14151-5007.
TRI	Triad Chemical	504-473-9231	P.O. Box 310, Donaldsonville, LA 70346.
TRO	Troy Chemical Corp	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 14095.
UPM	UOP, Inc	312-391-2000	25 E. Algonguin Road, Des Plaines, IL 60017-5017.
UHL	Paul Uhlich & Co., Inc	914-478-2000	1 Railroad Ave., Hastings-on-Hudson, NY 10706.
DRL	Unichema North America	312-376-9000	4650 S. Racine Ave., Chicago, IL 60609.
NCI	Union Carbide Corp	201-628-2000	1600 Valley Rd., Wayne, NJ 07470.
NCI	BBA Div	201-628-2000	2051 N. Lane Ave., Jacksonville, FL 32236.
WTH	Chemical Div	201-628-9000	875 Harger St., Dover, OH 44622.
UCC	Union Carbide Corp., Industrial Chemical Div.	304-747-3825	P.O. Box 8361, Charleston, WV 25303.
UOC	Union Oil Co. of California	213-977-5131	1201 W. Fifth St., Los Angeles, CA 90017.
UTP	Union Texas Products Corp	713-623-6544	1330 Post Oak Blvd. Houston TX 77252-2120.
USR	Unroyal Chemical Co., Inc	203-573-3886	World Headquarters, Middlebury, CT 06749
UNN	United Aniline Co	617-762-4057	Endicot St., Norwood, MA 02062.
UNO	United Erie, Inc	814-456-7561	436 Huron St., Erie, PA 16502.
USB	U.S. Borax & Chemical Corp	213-251-5400	3075 Wilshire Blvd., Los Angeles, CA 90010.
USX	U.S. Steel, Div. of USX: Clariton Plant	412-433-4980	600 Grant St., Pittsburgh, PA 15219.
	Gary Works	412-433-4980	600 Grant St., Pittsburgh, PA 15219.
UTC	Unifex Chemical Corp	919-378-0985	520 Broome Rd., Greensboro, NC 27406.
UPJ	The Upjohn Co	616-323-4000	7000 Portage Rd., Kalamazoo, MI 49001.
CWN	Fine Chemicals	203-281-2700	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 & Marketing Co	512-246-2000	530 McCullough, San Antonio, TX 78292.
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	Veisicol Chemical Corp	708-898-9700	5600 N. River Rd., Rosemont, IL 60018.
VIN	Vineland Chemical Co., Inc	609-691-3535	1611 Wheat Rd., Vineland, NJ 08360.
VCC	Vinings Industries, Inc	404-436-1542	3950 Cumberland Pkwy., Atlanta, GA 30101.
VKR	Virkler Co	704-527-2350	1022 Pressley Rd., Charlotte, NC 28210.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1989

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1989 are listed below alphabetically, together with their identification codes as used in the 15 individual sections of this report)

Identification code	Name of company	Telephone number	Office address
VST	Vieta 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.
VYN	Vygen Corporation	216-998-1120	Middle Road, Ashtabula, OH 44004.
SWS	Wacker Silicones Corp	517-264-8500	3301 Sutton Rd., Adrian, MI 49221.
WJ	Warner-Jenkinson Co	314-658-7342	2526 Baldwin St., St. Louis, MO 63106.
WCA	West Coast Adhesives Co	503-286-3515	11104 NW Front Ave., Portland, OR 97231.
EW	Westinghouse Electric Corp., Insulating Materials Div.	412-864-7960	Route 993, Manor, PA 15665.
WPG	WestPoint Pepperell, Inc GriffTex Chemical Co. Sub.	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 St., Wheeling, WV 26003.
WCC	White Chemical Corp	201-621-4100	660 Frelinghuysen Ave., Newark, NJ 07114.
WHW	Whittemore-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.
WTC	Witco Corp	201-573-2800	155 Tice Blvd., Woodcliff Lake, NJ 07675.
WCL	Wright Corp	919-251-0234	102 Orange St., Wilmington, NC 28403.
WYK	Wyckoff Chemical Co., Inc	616-637-8474	1421 Kalamazoo St., S. Haven, MI 49090.
WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.	215-341-3867	P.O. Box 13745, Philadelphia,

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'-azodibenzenesulfonic 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.
Benzotrichloride	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-sulfobenzoic acid.
C-Amine (Lake Red C acid)	3-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.
Chryszin	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	Dianilidine diisocyanate.
DDB	p-Dibutoxybenzene.
Decacyclene	Diacenaphtho[1,2-];1',2'-]fluoranthene.
Dehydrothio-p-toluidine	2-(p-Aminophenyl)-6-methylbenzothiazole.
Developer Z	3-Methyl-1-phenyl-2-pyrazolin-5-one.
o-Dianilidine	3,3'-Dimethoxybenzidine.
1,1'-Dianthrimide	1,1'-Iminodianthraquinone.
Dibenzanthrone	Violanthrone.
Dichlone	2,3-Dichloro-1,4-naphthoquinone.
4,4'-Dihydrocydiphenylsulfone	4,4'-Sulfonyldiphenol.
Dimethyl POPOP	1,4-Bis[2-(4-methyl-5-phenyloxazoyl)]benzene.
4,5-Dinitrochryszin	1,8-Dihydroxy-4,5-dinitroanthraquinone.
Dioxy S acid	4,5-Dihydroxy-1-naphthalenesulfonic acid.
Diphenyl epsilon acid	6,8-Dianilino-1-naphthalenesulfonic acid.
Durene	1,2,4,5-Tetramethylbenzene.
Epilone acid (Andresen's acid)	8-Hydroxy-1,6-naphthalenedisulfonic acid.

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

Common name	Standard (chemical abstracts) name
F acid	7-Hydroxy-2-naphthalenesulfonic acid.
Fast Red G base	2-Nitro-p-toluidine [N ₂ =1].
Fast Scarlet R base	5-Nitro-o-anisidine [NH ₂ =1].
Fischer's aldehyde	1,3,3-Trimethyl- ω^2 , α -indolineacetaldehyde.
Fischer's base	1,3,3-Trimethyl-2-methyleneindoline.
Freund's acid	4-Amino-2,7-naphthalenedisulfonic acid.
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-naphthalenetrisulfonic 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.
Naphthlonic acid	4-Amino-1-naphthalenesulfonic acid.
o-Naphthlonic 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.
Pentaanthrilmide	1,4,5,8-Tetrakis(1-anthraquinonylamino) anthraquinone.
Peri 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 peri acid	8-Anilino-1-naphthalenesulfonic acid.
Picric acid	2,4,6-Trinitrophenol.
POPOP	1,4-Bis[2-(5-phenyloxazolyl)]benzene.
Pseudocumene	1,2,4-Trimethylbenzene.
Pyrazoleanthrone	Anthra[1,9-cd]pyrazol-6(2H)-one.

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

<i>Common name</i>	<i>Standard (chemical abstracts) name</i>
Pyrazoleanthrone yellow	[3,3'-Blanthral[1,9-cd]-pyrazole]-6,6'-(2H,2'H)dione
Pyrazolone T	5-Oxo-1-(p-sulphonyl)-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	Quinophthalone.
R salt	3-Hydroxy-2,7-naphthalenedisulfonic acid, disodium salt.
RG acid (Violet acid)	4-Hydroxy-2,7-naphthalenedisulfonic acid.
Rhodulne 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-toluidine.
SS acid (Chicago acid)	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Sulfanilic acid	p-Aminobenzenesulfonic acid.
o-Sulfobenzaldehyde	o-Formylbenzenesulfonic acid.
Tetralin	1,2,3,4-Tetrahydronaphthalene.
Thiolindoxyl	3(2H)-Thianaphthenone.
Thiosalicylic acid	o-Mercaptobenzoic acid.
Tobias acid	2-Amino-1-naphthalenesulfonic acid.
TODI	Bitolylene diisocyanate.
o-Toldine	3,3'-Dimethylbenzidine.
α-Toluic acid	Phenylacetic acid.
α-Tolunitrile	Phenylacetoneitrile.
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, 1989,
HARMONIZED SYSTEM BASIS

Synthetic Organic Chemicals, U.S. Production and Sales, 1989, Harmonized System Basis

The following table contains 1989 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, 1989, harmonized system basis

HS/ number	Description	Production	Sales	
		Quantity Kilograms	Quantity Kilograms	Value Dollars
271113	Butanes, liquefied	383,306,643	319,572,334	55,765,838
290121	Ethylene	15,870,502,405	7,622,373,816	3,991,875,940
290122	Propene (Propylene)	9,331,186,249	5,269,184,835	2,109,565,279
290124	Buta-1,3-diene and isoprene	1,573,778,426	1,467,717,690	633,080,216
290211	Cyclohexane	1,031,210,803	1,048,405,116	489,447,663
290220	Benzene	5,414,072,000	3,504,956,323	1,360,244,906
290230	Toluene	2,634,809,000	1,764,066,854	548,598,556
290244	Mixed xylene isomers	2,947,573,624	1,421,630,540	506,041,875
290250	Styrene	3,781,561,000	1,965,840,000	1,411,501,000
290260	Ethylbenzene	4,189,377,000	145,353,000	80,532,885
290270	Cumene	2,007,702,325	1,271,899,046	601,429,107
290311	Chloromethane (Methyl chloride) and chloroethane (Ethyl chloride)	282,253,781	(¹)	(¹)
290312	Dichloromethane (Methylene chloride)	218,468,084	140,857,000	66,777,169
290313	Chloroform (Trichloromethane)	266,534,101	229,311,000	102,223,000
290321	Vinyl chloride (Chloroethylene)	4,597,104,069	1,181,140,330	764,707,466
290340	Halogenated deriva of acyclic hydrocarbons containing two or more different halogens	591,928,000	463,488,000	1,012,087,000
290511	Methanol (Methyl alcohol)	3,704,475,000	2,238,583,000	326,720,000
290512	Propan-1-ol (Propyl alcohol) and propan-2-ol (Isopropyl alcohol)	751,152,177	588,799,816	275,555,201
290513	Butan-1-ol (n-Butyl alcohol)	794,099,727	260,716,254	147,693,286
290514	Other butanols nsp	(¹)	57,409,000	41,135,000
290531	Ethylene glycol (Ethandiol)	2,477,135,000	2,257,087,000	1,983,438,000
290532	Propylene glycol (Propane-1,2-diol)	266,300,160	290,795,854	251,006,259
290542	Pentaerythritol	47,967,523	51,848,369	70,241,884
290544	D-glucitol (Sorbitol)	150,651,000	113,495,956	94,556,384
290711	Phenol (Hydroxybenzene) and its salts	1,726,417,000	654,045,000	619,665,000
290713	Octylphenol, nonylphenol and their isomers; salts thereof	88,949,769	(¹)	(¹)
290723	4,4'-Isopropylidenediphenol (Bisphenol A, Diphenylpropane) and its salts	563,073,906	180,964,875	221,658,210
290941	2,2'-Oxydiethanol (Diethylene glycol, Digol)	197,302,558	158,023,863	109,030,248
290942	Monomethyl ethers of ethylene glycol or of diethylene glycol	50,256,964	45,340,817	50,364,173
290943	Monobutyl ethers of ethylene glycol or of diethylene glycol	206,668,425	180,968,624	179,877,363
291010	Oxirane (Ethylene oxide)	2,281,986,000	207,834,629	269,957,878
291211	Methanal (Formaldehyde)	2,673,233,000	1,305,488,000	173,426,000
291213	Butanal (Butyraldehyde, normal isomer)	763,571,756	(¹)	(¹)
291411	Acetone	1,145,022,000	711,140,045	294,471,619
291412	Butanone (Methyl ethyl ketone)	204,157,432	226,261,480	138,569,661
291413	4-Methylpentan-2-one (Methyl isobutyl ketone)	77,494,000	75,633,000	64,813,000
291422	Cyclohexanone and methylcyclohexanones	483,276,918	56,672,973	64,322,449
291441	4-Hydroxy-4-methylpentan-2-one (Diacetone alcohol)	(¹)	9,851,413	10,535,384
291521	Acetic acid	1,493,971,000	358,763,000	137,830,000
291522	Sodium acetate	20,036,000	(¹)	(¹)
291531	Ethyl acetate	132,346,197	94,672,902	60,689,412
291532	Vinyl acetate	1,157,802,383	589,091,527	473,258,716
291533	n-Butyl acetate	101,632,953	86,374,150	56,020,051
291534	Isobutyl acetate	37,302,881	24,438,841	16,641,309
291731	Diethyl orthophthalates	9,725,036	8,107,763	9,187,703
291732	Diethyl orthophthalates	138,827,841	139,588,078	121,916,833
291735	Phthalic anhydride	416,125,000	195,880,041	130,785,913
291822	O-Acetylsalicylic acid (Aspirin), its salts and esters	10,200,745	(¹)	(¹)
292141	Aniline and its salts	460,998,000	316,383,316	215,866,614
293211	Tetrahydrofuran	78,275,423	33,751,110	64,063,618
310210	Urea, whether or not in aqueous solution	5,368,457,000	5,074,040,000	696,343,000
320411	Disperse dyes and preparations based thereon	12,184,000	10,595,000	117,706,000

Table C-1—Continued
Synthetic organic chemicals: U.S. production and sales, 1989, harmonized system basis

HS/ number	Description	Production		Sales
		Quantity Kilograms	Quantity Kilograms	Value Dollars
320412	Acid dyes, premetallized or not, mordant dyes and preparations based thereon	5,764,000	6,339,000	73,370,000
320413	Basic dyes and preparations based thereon	5,476,000	5,235,000	70,523,000
320414	Direct dyes and preparations based thereon	28,823,000	20,949,000	118,619,000
320415	Vat dyes (including those usable in that state as pigments) and preparations based thereon	16,713,689	16,698,613	78,861,434
320416	Reactive dyes and preparations based thereon	13,832,000	9,830,000	118,972,000
320417	Pigments and preparations based thereon	50,053,000	42,980,000	697,145,000
320420	Fluorescent brightening agents	60,711,000	57,181,000	119,787,000
390110	Polyethylene having a specific gravity of less than 0.94	4,121,039,260	3,864,414,532	3,891,068,344
390120	Polyethylene having a specific gravity of 0.94 or more	3,197,750,000	3,064,941,000	3,486,406,000
390210	Polypropylene	3,039,309,000	2,973,767,593	2,473,615,661
390311	Polystyrene, expandable	315,828,422	259,183,240	403,757,149
390319	Polystyrene, other than expandable	2,084,435,597	1,696,290,515	2,060,471,710
390330	Acrylonitrile-butadiene-styrene (ABS) copolymers	547,436,000	500,304,000	1,021,475,000
390461	Polytetrafluoroethylene (PTFE)	(¹)	12,482,036	174,664,627
390511	Polymers of vinyl acetate in aqueous dispersion	296,642,158	215,565,554	347,713,899
390610	Polymethyl methacrylate	291,416,014	189,328,819	450,151,867
390730	Epoxide resins	386,383,675	251,587,153	660,328,778
390750	Alkyd resins	322,475,327	218,430,232	382,070,122
390810	Polyamide-6, -11, -12, -6,6, -6,9, -8,10 or -6,12 (nylon type)	1,448,708,000	967,860,000	3,454,463,000
390910	Urea resins; thiourea resins	933,877,000	851,717,000	255,815,000
390920	Melamine resins	81,613,071	69,167,585	135,114,736
390940	Phenolic resins	833,553,509	517,046,991	972,065,501
390950	Polyurethanes	216,759,374	101,481,582	364,023,274

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
Alphabetical chemical Index

Chemical name	Sect. Item No.	No.	Chemical name	Sect. Item No.	No.
Accelerators, activators, and vulcanizing agents, acyclic, other	09	163,000	Acid Blue 15	04	133,000
Accelerators, activators, and vulcanizing agents, cyclic, other	09	49,000	Acid Blue 25	04	136,000
Acetaldehyde dimethylhydrazone	15	782,000	Acid Blue 40	04	140,000
Acetaldehyde ethyl phenethyl acetal	07	307,200	Acid Blue 41	04	141,000
Acetaldehyde phenethyl propyl acetal	07	1,300	Acid Blue 62	04	145,000
Acetal resins	08	1,400	Acid Blue 67	04	145,067
Acetamide	15	19,000	Acid Blue 92	04	153,000
Acetamidooethanol (N-Acetyl-ethanolamine)	15	227,000	Acid Blue 113	04	157,000
Acetaminophen	06	220,000	Acid Blue 118	04	158,000
Acetazolamide	06	392,000	Acid Blue 145	04	161,000
Acetic acid, amides with polyalkylene polyamines, salt	12	736,000	Acid Blue 231	04	168,000
Acetic acid, synthetic (100%)	15	357,900	Acid Blue 281	04	168,283
Acetoacetanilide	03	486,000	Acid Blue 283	04	168,298
0-Acetoacetanilide	03	9,000	Acid Blue 321	04	168,321
Acetoacetylaldehyde	05	10,000	Acid Blue 324	04	168,324
Acetoacetylaldehyde, all others	05	17,000	Acid Blue 330	04	168,330
0-Acetoacetotolulide	03	11,000	Acid blue dyes, all other	04	169,000
2-(Acetoacetoxy)ethyl methacrylate	03	1281,500	Acid Brown 14	04	189,000
2,4'-Acetoacetoxylylide	03	11,500	Acid Brown 19	04	190,000
Acetoguanamine	03	11,500	Acid Brown 50	04	194,050
2'-Acetomaphthone (β -Methyl naphthyl ketone)	07	115,200	Acid Brown 97	04	195,000
Acetone	15	1,500	Acid Brown 147	04	197,147
Acetone-formaldehyde resins	08	806,000	Acid Brown 159	04	199,159
Acetonitrile	15	1,000	Acid Brown 160	04	199,160
3-(α -Acetonylbenzyl)-4-hydroxycoumarin (Warfarin)	13	432,000	Acid Brown 161	04	199,161
Acetophenone, tech.	03	169,000	Acid Brown 165	04	199,165
p-Acetotolulide	03	14,000	Acid Brown 166	04	199,166
1-Acetoxy-2-sec-butyl-1-ethenylcyclohexane	07	15,000	Acid Brown 197	04	199,188
6-Acetoxy-2,4-dimethyl-1,3-dioxane	15	93,500	Acid Brown 229	04	199,229
Acetylacetones, all other	15	1,000	Acid Brown 230	04	200,237
Acetylacetone peroxide	15	1281,700	Acid Brown 264	04	200,264
N-[(Acetylamino)methyl]-2-chloro-N-(2,6-diethylphenyl) acetamide	15	1281,990	Acid Brown 439	04	200,434
Acetyl-n-butyl (2,3-Hexanedione)	13	168,995	Acid Brown dyes, all other	04	209,000
Acetyl cedrene (Vertoflex)	07	126,000	(Acid Green 3)	05	230,003
Acetylene (For chemical use only)	02	33,550	Acid Green 5	04	170,000
N-Acetyl methyl anthranilate	07	68,500	Acid Green 16	04	172,000
Acetyl propionyl (2,3-Pentanedione)	07	68,555	Acid Green 20	04	177,000
2-Acetylpyridine	03	19,450	Acid Green 25	04	179,000
Acid Black 1	04	203,000	Acid Green 70	04	184,000
Acid Black 2	04	204,000	Acid green dyes, all other	04	186,000
Acid Black 52	04	211,000	Acid Orange 7	04	43,000
Acid Black 60	04	214,000	Acid Orange 8	04	44,000
Acid Black 63	04	214,063	Acid Orange 10	04	45,000
Acid Black 92	04	215,000	Acid Orange 24	04	47,000
Acid Black 107	04	216,000	Acid Orange 60	04	54,000
Acid Black 172	04	218,172	Acid Orange 64	04	57,000
Acid Black 194	04	218,194	Acid Orange 89	04	61,089
Acid Black 210	04	218,210	Acid Orange 116	04	62,000
Acid Black dyes, all other	04	219,000	Acid Orange 128	04	64,000
Acid Blue 9	04	219,000	Acid Orange 152	04	65,152
	04	219,000	Acid Orange 156	04	65,156
	04	132,000	Acid Orange 161	04	65,161
	04		(Acid Red 26)	05	214,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Acid Red 1	04	Acid Yellow 226	04
Acid Red 4	04	Acid Yellow 235	04
Acid Red 14	04	Acid yellow dyes, all other	04
Acid Red 33	04	Aciobenzazone	06
Acid Red 57	04	Acrolein (aldehyde)	15
Acid Red 73	04	Acrylamide-2-methylpropanesulfonic acid, ethylene-2	15
Acid Red 87	04	Acrylamide salt polymer	14
Acid Red 97	04	Acrylamide-acrylic acid copolymer	14
Acid Red 119	04	Acrylamide-acrylic acid copolymer, sodium salt	14
Acid Red 137	04	Acrylamide-acrylic acid copolymer, sodium salt	14
Acid Red 151	04	Acrylamide polymer with N,N-Diethyl-N-methyl-2[[1-oxo-2-propenyl)oxy]ethaniminium sulfate	15
Acid Red 174	04	Acrylamide-trimethylaminethyl acrylate chloride polymer	14
Acid Red 182	04	Acrylamide-trimethylaminethyl methacrylate chloride	14
Acid Red 186	04	Acrylamide-alkyd copolymer resins	08
Acid Red 226	04	Acrylic acid	15
Acid Red 266	04	Acrylic monomers, mixed	15
Acid Red 278	04	Acrylonitrile-butadiene-styrene (ABS) terpolymer resins	08
Acid Red 295	04	Acrylonitrile monomer	15
Acid Red 299	04	Acrylonitrile, monomer	15
Acid Red 337	04	Acyclic amphoteric surface-active agents, all other	12
Acid Red 364	04	Acyclic herbicides	13
Acid Red 384	04	Acyclic insecticides, all other	13
Acid Red 388	04	Acyclic insecticides, all other	11
Acid Red 396	04	Acyclic insecticides, all other	11
Acid Red 410	04	Acyclovir	06
Acid Red 418	04	Acyclic elastomers, all other	10
Acid Red 419	04	Adipic acid	15
Acid Red 429	04	Adipic acid, ammonium salt	15
Acid red dyes, all other	04	Adipic acid-crosslinked polyacrylamide	15
Acids, acid anhydrides, and acyl halides, all other	15	Adipic acid-diethylenetriamine-epichlorohydrin polymer	14
Acid Violet 3	04	Adipic acid esters, all other	15
Acid Violet 7	04	Adipic acid, sodium salt	11
Acid Violet 12	04	Adipic acid type complex linear polyesters and polymeric plasticizers	15
Acid Violet 17	04	Adipic plasticizers	11
Acid Violet 49	04	Adipic thydrazide	15
[Acid Yellow 1]	05	Adiponitrile	15
[Acid Yellow 23]	05	Adiponitrile	15
Acid Yellow 3	04	β-Alanine-N-(2-hydroxyethyl)-N-2-oxococoyl amino ethyl, sodium salt	12
Acid Yellow 17	04	Albumin	06
Acid Yellow 19	04	Albumin	06
Acid Yellow 23	04	albuterol sulfate	05
Acid Yellow 25	04	Alcohol esters, monohydric, all other	15
Acid Yellow 26	04	C ₁ -C ₄ , Alcohol esters of lactic acid	15
Acid Yellow 36	04	C ₁ -Alcohol, ethoxylated, propoxylated and phosphated	15
Acid Yellow 50	04	Alcohol mixtures, other	12
Acid Yellow 59	04	Alcohol mixtures, C ₁₁ or lower only	15
Acid Yellow 65	04	Alcohol mixtures, C ₁₁ through C-18 only	15
Acid Yellow 73	04	Alcohol mixtures, C ₁₁ and their esters, C ₈ and higher	15
Acid Yellow 99	04	Alcohols and phenols, alkoxylated and phosphated or polyphosphated, all other	15
Acid Yellow 129	04	Alcohols, unimixed C ₁ or higher, all other	12
Acid Yellow 135	04	Alcohols, unimixed C ₁ or lower, all other	15
Acid Yellow 137	04	Aldalene	03
Acid Yellow 151	04	Aldalene	03
Acid Yellow 159	04	Aldehyde-amine reaction products, cyclic, other	09
Acid Yellow 174	04	Aldehyde-amine reaction products, cyclic, other	09
Acid Yellow 198	04	Aldehyde-amine reaction products, cyclic, other	09
Acid Yellow 200	04	Aldehyde-amine reaction products, cyclic, other	09
Acid Yellow 219	04	Aldehyde-amine reaction products, cyclic, other	09
Acid Yellow 226	04	Aldehyde-amine reaction products, cyclic, other	09
Acid Yellow 235	04	Aldehyde-amine reaction products, cyclic, other	09
Acid yellow dyes, all other	04	Aldehyde-amine reaction products, cyclic, other	09
Aciobenzazone	06	Aldehyde-amine reaction products, cyclic, other	09
Acrolein (aldehyde)	15	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide-2-methylpropanesulfonic acid, ethylene-2	15	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide salt polymer	14	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide-acrylic acid copolymer	14	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide-acrylic acid copolymer, sodium salt	14	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide-acrylic acid copolymer, sodium salt	14	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide polymer with N,N-Diethyl-N-methyl-2[[1-oxo-2-propenyl)oxy]ethaniminium sulfate	15	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide-trimethylaminethyl acrylate chloride polymer	14	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide-trimethylaminethyl methacrylate chloride	14	Aldehyde-amine reaction products, cyclic, other	09
Acrylamide-alkyd copolymer resins	08	Aldehyde-amine reaction products, cyclic, other	09
Acrylic acid	15	Aldehyde-amine reaction products, cyclic, other	09
Acrylic monomers, mixed	15	Aldehyde-amine reaction products, cyclic, other	09
Acrylonitrile-butadiene-styrene (ABS) terpolymer resins	08	Aldehyde-amine reaction products, cyclic, other	09
Acrylonitrile monomer	15	Aldehyde-amine reaction products, cyclic, other	09
Acrylonitrile, monomer	15	Aldehyde-amine reaction products, cyclic, other	09
Acyclic amphoteric surface-active agents, all other	12	Aldehyde-amine reaction products, cyclic, other	09
Acyclic herbicides	13	Aldehyde-amine reaction products, cyclic, other	09
Acyclic insecticides, all other	13	Aldehyde-amine reaction products, cyclic, other	09
Acyclic insecticides, all other	11	Aldehyde-amine reaction products, cyclic, other	09
Acyclic insecticides, all other	11	Aldehyde-amine reaction products, cyclic, other	09
Acyclovir	06	Aldehyde-amine reaction products, cyclic, other	09
Acyclic elastomers, all other	10	Aldehyde-amine reaction products, cyclic, other	09
Adipic acid	15	Aldehyde-amine reaction products, cyclic, other	09
Adipic acid, ammonium salt	15	Aldehyde-amine reaction products, cyclic, other	09
Adipic acid-crosslinked polyacrylamide	15	Aldehyde-amine reaction products, cyclic, other	09
Adipic acid-diethylenetriamine-epichlorohydrin polymer	14	Aldehyde-amine reaction products, cyclic, other	09
Adipic acid esters, all other	15	Aldehyde-amine reaction products, cyclic, other	09
Adipic acid, sodium salt	11	Aldehyde-amine reaction products, cyclic, other	09
Adipic acid type complex linear polyesters and polymeric plasticizers	15	Aldehyde-amine reaction products, cyclic, other	09
Adipic plasticizers	11	Aldehyde-amine reaction products, cyclic, other	09
Adipic thydrazide	15	Aldehyde-amine reaction products, cyclic, other	09
Adiponitrile	15	Aldehyde-amine reaction products, cyclic, other	09
Adiponitrile	15	Aldehyde-amine reaction products, cyclic, other	09
β-Alanine-N-(2-hydroxyethyl)-N-2-oxococoyl amino ethyl, sodium salt	12	Aldehyde-amine reaction products, cyclic, other	09
Albumin	06	Aldehyde-amine reaction products, cyclic, other	09
Albumin	06	Aldehyde-amine reaction products, cyclic, other	09
albuterol sulfate	05	Aldehyde-amine reaction products, cyclic, other	09
Alcohol esters, monohydric, all other	15	Aldehyde-amine reaction products, cyclic, other	09
C ₁ -C ₄ , Alcohol esters of lactic acid	15	Aldehyde-amine reaction products, cyclic, other	09
C ₁ -Alcohol, ethoxylated, propoxylated and phosphated	15	Aldehyde-amine reaction products, cyclic, other	09
Alcohol mixtures, other	12	Aldehyde-amine reaction products, cyclic, other	09
Alcohol mixtures, C ₁₁ or lower only	15	Aldehyde-amine reaction products, cyclic, other	09
Alcohol mixtures, C ₁₁ through C-18 only	15	Aldehyde-amine reaction products, cyclic, other	09
Alcohols and phenols, alkoxylated and phosphated or polyphosphated, all other	15	Aldehyde-amine reaction products, cyclic, other	09
Alcohols, unimixed C ₁ or higher, all other	12	Aldehyde-amine reaction products, cyclic, other	09
Alcohols, unimixed C ₁ or lower, all other	15	Aldehyde-amine reaction products, cyclic, other	09
Aldalene	03	Aldehyde-amine reaction products, cyclic, other	09
Aldalene	03	Aldehyde-amine reaction products, cyclic, other	09
Aldehyde-amine reaction products, cyclic, other	09	Aldehyde-amine reaction products, cyclic, other	09
Aldehyde-amine reaction products, cyclic, other	09	Aldehyde-amine reaction products, cyclic, other	09

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Aldehydes, acyclic, all other	15	4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	07
Aliphatic hydrocarbon sulfides	14	Allyl disulfide	07
Alkanolamine condensates, all other	12	Allyl heptanoate	07
Alkene thiophosphonate	14	Allyl hexanoate	07
Alkyl succinimide	14	Allyl methacrylate	07
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	13	4-Allyl-2-methoxyphenol (Eugenol)	15
Alkoxy triethyl titanate	12	1-(Allyloxy)-2,3-epoxypropane (Allyl glycidyl ether)	15
Alkoxy phenol	08	3-Allyloxy-2-hydroxypropane sulfonic acid, sodium salt	15
Alkyd copolymers, all other	08	Allyl resins	08
Alkylalcohol ethoxylated and carbonated, sodium salt	12	Allyl sulfonate, sodium salt	08
2-(C ₁₅₋₁₇ alkoxy)-1-(C ₁₂₋₁₆ aminoethyl)	12	Alpha olefins, C ₆ -C ₁₀	02
N-alkylamine bis(methyl)imidazolium, methyl sulfate	14	62-100	02
t-Alkylamines, primary, mixed	14	Alprazolam	06
Alkyl aromatics, all other	02	Alprostadiol	06
Alkylary-p-phenylenediamines	09	Aluminum acetate	15
Alkylaryl phosphites, mixed	09	Aluminum acetylacetonate	15
Alkylbenzene straight-chain (Except dodecyl and tridecyl)	09	Aluminum chlorohydroxyphenylacetylene blue	03
1- α -Alkylcarboxylic acid salts (Isocarboxylic acid salts), all other	03	Aluminum di-sec-butoxide acetoacetic ester chelate	15
Alkyldimethyl amine oxide	15	Aluminum distearate	15
Alkyl glycidyl ether, C ₁₂ -C ₁₄ and C ₁₂ -C ₁₆	12	Aluminum ethylhexanoate	15
Alkyl glycidyl ethers, C ₆ -C ₁₀	15	Aluminum ethyl-3-oxobutanoate-0', β -dihydroxy T-4	15
Alkyl imidazole	14	Aluminum formate	15
3-(C ₁₂₋₁₆ alkoxy)-1-propanamine	12	Aluminum isocitrate, diisopropoxide	15
N-(C ₁₂₋₁₆ alkoxy)-1-propanamine	12	Aluminum isopropoxide (Aluminum isopropylate)	15
Alkylphenol, calcium salt	14	Aluminum monostearate	15
Alkylphenol formaldehyde condensate, alkoxylated	15	Aluminum octanoate	15
Alkylphenol-formaldehyde condensates, alkoxylated, all other	15	Aluminum tri-sec-butoxide	15
Alkylphenol formaldehyde copolymer	12	Aluminum tristearate	15
Alkylphenols, mixed	14	Amides, all other	15
Alkylpyridines, mixed	03	Amidoamines	06
Alkyl succinic anhydride	14	Amino dihydrochloride	06
Alkyl succinyl amide	14	Amino oxides and oxygen-containing amines (Except those with amide linkages), acyclic, all other	12
All other specific	14	Amino oxides and oxygen-containing amines (Except those having amine linkages), cyclic, all other	12
All other specific flavor and perfume materials	07	Amines, all other containing oxygen, all other	12
All other benzoid or naphthalenoid chemicals	07	Amines, all other	12
All other dyes	04	Amino salts of fatty, fatty, and tall oil acids, all other	12
Allo-octene	07	3-Aminoacetamide (Acetyl-p-phenylenediamine)	03
Alloprinolol	06	4-Aminoacetamide (Acetyl-p-phenylenediamine)	03
All other polybutadiene (BF) type elastomers	10	Amino acids and salts, acyclic, all other	14
All other products from petroleum and natural gas, cyclic	02	Amino acids and salts, cyclic, all other	14
All other succinic anhydride derivatives	15	1-Aminobenzimidazole and salt	03
All other terpeneol ethercyclic, or allycyclic flavor and perfume chemicals	07	p-Aminobenzimidazole	03
Allyl alcohol	15	p-Aminobenzoic acid, tech	03
Allylamine	07	2-Amino-6-oxothiazolonesulfonic acid	03
p-Allylanisole	15	2-Amino-1-bromo-3-chloroanthracenone	03
Allyl n-butyl trithiocarbonate	14	1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	03
Allyl cyclohexyl propionate	07	7-Aminocephalosporanic acid [SO ₃ H=1]	03
		6-Amino-5-chloro-p-toluenesulfonic acid [SO ₃ H=1] (2B Acid)	03
			83,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
3-Amino-2,5-dichlorobenzoic acid, ammonium salt (2,5-Dichloro-3-aminobenzoic acid, ammonium salt)	13	40,500	Ammonium acetate	15	588,000
4-Amino-N,N-di(β-hydroxyethyl)aniline sulfate	03	91,503	Ammonium benzoate	15	621,000
Amindimethyl butyrolitrile	15	434,400	Ammonium citrate	15	647,400
4-Amino-6-(1,1-dimethyl-ethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	13	40,600	Ammonium formate	06	623,000
2-Aminoethanol hydrochloride	15	309,900	Ammonium lactate	15	672,900
2-Aminoethanol (Monoethanol amine) sulfate	15	310,000	Ammonium mercaptoacetate	15	691,000
Aminoethoxyethanol	15	311,000	Ammonium oxalate	15	722,000
2-(2-Aminoethylamino)ethanol (Aminoethylthanolamine)	15	312,000	Ammonium oxydiethylenebis (alkyl* dimethyl chloride)	13	245,022
(2-Aminoethyl)amino ethanol, reaction product with octadecanoic acid	15	312,500	Ammonium phenolsulfonate	06	553,000
N-Aminoethylaminopropyl trimethoxysilane	15	1378,450	Ammonium polyacrylate	14	426,000
(2-Aminoethyl)ethyl(γ-droganated talow alkyl)(2-hydroxyethyl)ammonium ethyl sulfate	12	448,000	Ammonium propionate	15	749,000
2-Aminoethyl mercaptoacetate (Monoethanolamine thioglycolate)	15	313,000	Ammonium stearate	06	443,000
1-(2-Aminoethyl)-2-naphtimethyl-2-imidazole	12	404,450	Amobarbital, sodium	06	444,000
1-(2-Aminoethyl)-2-nor (tail oil alkyl)-2-imidazole	12	406,000	Amoxsaline	06	9,600
2-Amino-2-ethyl-1,3-propanediol	15	314,000	Amoxicillin (trihydrate)	06	9,500
N-2-(4-Amino-N-ethyl-m-toluidino)ethyl methanesulfonamide	14	318,000	Amoxicillin (anhydrous)	06	512,000
Amphotericin B	06	11,000	Amphetamine sulfate	06	1,000
Amprolium	06	574,900	Amphotericin B	06	1,000
2-Amino-2-(hydroxymethyl)-1,3-propanediol [1-tris(hydroxymethyl)amino]ethane	15	316,000	Ampicillin (trihydrate)	06	11,000
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-9-anilidethioctic acid)	03	116,803	Ampicillin, sodium	06	166,000
m-[(4-Amino-3-hydroxyphenyl)azo]benzenesulfonic acid	03	118,000	Amyl acetate (n-Pentyl acetate)	06	886,000
2-Amino-2-methyl-1,3-propanediol	15	317,000	Amyl acetates, all other	15	888,000
2-Amino-2-methyl-1-propanol	15	319,000	Amylases, all other	17	98,000
2-Amino-2-methylpropyl 8-bromothioethylsulfate	03	320,000	α-Amyl cinnamic aldehyde	04	5,550
2-Amino-2-methylpropyl 8-bromothioethylsulfate	03	330,100	Amyl cinnamic aldehyde dimethyl acetal	07	5,650
2-Amino-5-methylpyridine	03	133,600	Amyl cinnaryl alcohol	07	5,650
2-Amino-6-methylpyridine	03	134,000	Amyl cyclohexyl acetate	07	93,900
2-Amino-7-naphthalenedisulfonic acid	03	145,000	tert-Amyl hydroperoxide	06	367,000
2-Amino-5-nitrothiazole	03	178,000	Amyl nitrite	15	721,500
5-Amino-2-[[2-oxo-5-benzimidazolyl)amino]benzenesulfonic acid	03	178,400	Amyl ortho- and para- dimethylaminobenzoates	12	124,000
6-Aminopentanoic acid	03	182,000	Amyphenol-formaldehyde, alkoxylated	09	124,000
p-Aminophenol	03	186,000	p-tert-Amyphenol sulfide (Tackifier)	07	93,650
p-[[β-Aminophenyl)azo]benzenesulfonic acid	03	188,000	Anabolic agents and androgens, all other	06	644,000
3-[[4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	03	189,000	Anhydride-acid mixture	15	492,500
3-Aminophenylsophonic acid	03	193,802	Anhydrosorbital diolate	12	589,000
1-(3-Aminopropyl)morpholine	15	6,000	Anhydrosorbital esters, all other	12	603,000
2-Aminopyridine	03	194,000	Anhydrosorbital monoester of tall oil acids	12	590,000
4-Aminopyridine	03	195,000	Anhydrosorbital monolaurate	12	591,000
Aminosalicic acid	06	142,000	Anhydrosorbital mono-oleate	12	592,000
5-Aminosallylic acid	06	197,000	Anhydrosorbital monopalmitate	12	593,000
2-Aminothiazole nitrate	03	203,050	Anhydrosorbital sesquiolate	12	596,000
4-Amino-m-toluenesulfonic acid [SO ₃ H=1]	03	202,000	Anhydrosorbital triester of tall oil acids	12	600,000
6-Amino-m-toluenesulfonic acid [SO ₃ H=1]	03	203,000	Anhydrosorbital triester of tall oil acids	12	602,000
4-Amino-3,5-trichloropicolinic acid (Picloram)	13	41,000	Aniline (Aniline oil)	03	212,000
Amtriptyline hydrochloride	06	525,000	Aniline, ethoxylated	12	342,200
			2-Anilinoethanol	03	215,000
			Anilinoethanesulfonic acid and salt	03	219,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sec't. Item No.	Chemical name	Sec't. Item No.
p-Anilinophenol	09	Azolic Diazo Component 5, salt	04
Anionic surfactant-active agents, all other	86,000	Azolic Diazo Component 8, salt	04
p-Anisaldehyde	17	Azolic Diazo Component 9, salt	04
p-Anisidine	6,000	Azolic Diazo Component 10, salt	04
p-Anisidomethanesulfonic acid	228,000	Azolic Diazo Component 12, salt	04
Anisole	230,000	Azolic Diazo Component 13, salt	04
Anisyl acetate	230,080	Azolic Diazo Component 14, salt	04
Anisyl acetate	7,000	Azolic Diazo Component 20, salt	04
Anthranic acid (o-Aminobenzoic acid)	232,000	Azolic Diazo Component 32, salt	04
N,N'-[1,5-Anthraquinylene]dianthranilic acid	237,000	Azolic Diazo Component 34, salt	04
Antibiotics, for medicinal use, all other	62,000	Azolic Diazo Component 41, salt	04
Antifungal agents, all other	141,000	Azolic Diazo Component 42, salt	04
Antioxidants, antioxidants, and stabilizers, cyclic, other	106,000	Azolic Diazo Component 48, salt	04
l-Arabinose	455,000	Azolic diazo components, base, all other	04
Arachidylbehenylalkyl amine	417,900	Azolic diazo components, salt, all other	04
Aromatic, C ₆	36,010	Azolic Red 1	04
Arsanilic acid	151,000	Azolic Red 2	04
Aryl alkyl polyether alcohol	324,000	Azolic Red 6	04
Ascorbic acid	807,000	Azolic Violet 1	04
Aspirin	2,000	Azolic Violet compositions, all other	04
Atracturium besylate	385,000	Azolic Yellow 1	04
Aurantol	745,200	Aztreonam	06
Aurothioglucose	7,100	Bacillus thuringiensis	13
Azathioprine	277,000	Bacitracin (animal feed grade)	06
Azelaic acid	493,000	Bacterial amylase	14
Azelaic acid esters, all others	11,70,000	Barium acetate	15
Azidothymidine	186,300	Barium benzoate	15
2,2-Azobis(dimethyl pentane nitrile)	254,600	Barium butyrate	15
1,1'-Azobis[formamide]	424,700	Barium 2-ethylhexanoate	15
2,2'-Azobis[2-methyl butane nitrile]	15,435,000	Barium hydroxide	15
2,2'-Azobis[2-methylpropionitrile] [Azobisisobutyronitrile]	251,000	Barium laurate	14
Azolic Black 4	253,000	Barium stearate	15
Azolic Black compositions, all other	253,000	Basic black dyes, all other	04
Azolic Blue 3	238,000	Basic black dyes, all other, modified	04
Azolic Blue 9	246,000	(Basic Blue 7)	05
Azolic Coupling Component 2	297,000	Basic Blue 1	04
Azolic Coupling Component 3	298,000	Basic Blue 3	04
Azolic Coupling Component 4	299,000	Basic Blue 4	04
Azolic Coupling Component 7	301,000	Basic Blue 7	04
Azolic Coupling Component 12	305,000	Basic Blue 21	04
Azolic Coupling Component 17	307,000	Basic Blue 41	04
Azolic Coupling Component 19	311,000	Basic Blue 54	04
Azolic Coupling Component 18	314,000	Basic Blue 60	04
Azolic Coupling Component 20	316,000	Basic Blue 77	04
Azolic Coupling Component 21	317,000	Basic Blue 94 and 94:1	04
Azolic Coupling Component 34	318,000	Basic Blue 140	04
Azolic Coupling Component 35	319,000	Basic Blue 152	04
Azolic Coupling Component 43	320,000	Basic Blue 155	04
Azolic coupling components, all other	287,000	Basic blue dyes, all other	04
Azolic Diazo Component 5, base	282,000	Basic blue dyes, all other, modified	04
Azolic Diazo Component 13, base	283,000	(Basic Blue 14, PMA)	05
Azolic Diazo Component 14, base	285,000	Basic Brown 1	04
Azolic Diazo Component 32, base	271,000	Basic Brown 2	04
Azolic Diazo Component 1, salt	273,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Basic brown dyes, all other	04 358,000	Benzalkonium heparin	06 624,500
Basic brown dyes, all types, modified	04 418,999	Benzanilide	03 259,000
Basic Green 4	04 354,000	Benzene-, cumene-, toluene-, and xylenesulfonates, all other	12 151,000
Basic Green dyes, all other	04 354,100	Benzene High purity (98-100%)	02 5,500
[Basic Green 1, PMA]	05 230,101	Benzene Other	02 6,500
Basic Orange 1	04 327,000	Benzene phosphonic acid	15 9,250
Basic Orange 2	04 327,000	Benzene phosphorous chloride	03 261,500
Basic Orange 21	04 376,000	Benzene sulfonic acid	03 284,000
Basic Orange 26	04 329,000	Benzene sulfonic acid, 2-formyl-, sodium salt	12 137,710
Basic orange dyes, all other	05 215,001	Benzenesulfonyl chloride	03 284,200
[Basic Red 1]	04 333,000	Benzenesulfonyl chloride	03 286,000
Basic Red 1	04 333,000	1,2,4-Benzenetricarboxylic acid	03 287,000
Basic Red 12	04 383,000	1,2,4,5-Benzenetetracarboxylic acid	02 33,000
Basic Red 14	04 384,000	1,2,4-Benzenetricarboxylic acid, 1,2-dianhydride (Trimellitic anhydride)	03 288,100
Basic Red 15	04 384,000	Benzhydrol (Diphenylmethanol)	03 289,000
Basic Red 17	04 386,000	Benzimidazole	03 273,100
Basic Red 22	04 390,000	Benzocaine	06 134,000
Basic Red 29	04 391,046	Benzocaine	06 134,000
Basic Red 46	04 392,054	Benzole acid, 2-butoxyethanol ester	15 9,015
Basic Red 49	04 392,054	Benzole acid, butyl ester [butyl benzoate]	15 9,015
Basic Red 54	04 392,073	Benzole acid, 2-[4-(dimethylamino)-benzoyl]-	15 21,830
Basic Red 73	04 392,104	Benzole acid, C ₁₂ -C ₁₈ ester	15 9,050
Basic Red 104	04 392,111	Benzole acid esters, all other	15 9,050
Basic Red 111	04 334,000	Benzole acid, isodecyl ester	15 9,050
Basic red dyes, all other	05 210,050	Benzole acid, methyl ester	03 274,903
[Basic Red 81, PMA]	05 221,001	Benzole acid, sodium salt	15 13,000
(Basic Violet 1)	05 221,001	Benzole acid salts, all other	03 275,000
(Basic Violet 4)	05 221,010	Benzonitrile	06 425,000
(Basic Violet 10)	05 221,010	Benzonitrile	03 278,000
Basic Violet 1	04 335,000	Benzophenone	07 8,000
Basic Violet 3	04 337,000	Benzophenone	03 278,100
Basic Violet 4	04 338,000	2-Benzothiazolethiol, sodium salt	03 278,200
Basic Violet 10	04 338,011	1H-Benzotriazole	03 281,000
Basic Violet 11	04 338,011	Benzotriazole polychlorinated	15 15,300
Basic Violet 16	04 398,000	Benzotriazole potassium and sodium salts	15 15,400
Basic Violet 35	04 342,000	Benzotriazole substituted	15 15,500
Basic violet dyes, all other	05 221,003	2-Benzoxazolethiol	03 283,200
[Basic Violet 3, PMA]	05 221,003	Benzoyl chloride	15 16,000
(Basic Yellow 11)	04 360,000	Benzoyl chloride	03 286,000
Basic Yellow 11	04 361,000	Benzyl alcohol	15 17,000
Basic Yellow 13	04 362,000	Benzylamine	06 535,000
Basic Yellow 15	04 362,000	Benzylamine hydrochloride	15 17,000
Basic Yellow 28	04 368,000	Benzyl alcohol	12 508,190
Basic Yellow 29	04 370,053	Benzyl (alkylpyridinium) chloride	03 289,000
Basic Yellow 53	04 370,058	Benzylamine	03 290,000
Basic Yellow 56	04 370,065	2-(Benzylamino)ethanol	07 11,000
Basic Yellow 59	04 370,078	Benzyl butyrate	07 12,000
Basic Yellow 76	04 370,078	Benzyl benzoate	15 17,115
Basic Yellow 83	04 370,083	Benzyl chloroformate	07 13,000
Basic Yellow 84	04 370,094	Benzyl chloride	12 508,800
Basic Yellow 86	04 370,096	Benzyl (cocoonut oil alkyl)bis(2-hydroxyethyl) ammonium chloride	12 449,000
Basic Yellow 96	04 370,098	Benzyl (cocoonut oil alkyl)dimethylammonium chloride	12 509,000
Basic Yellow 98	04 325,000	Benzyl (cocoonut oil alkyl)dimethylammonium chloride	12 449,000
Basic yellow dyes, all other	15 229,200	Benzyl (cocoonut oil alkyl)methylammonium chloride	12 509,900
Basic yellow dyes, all other	07 7,500	Benzyl (hydrogenated tallow alkyl)methylammonium chloride	12 509,900
Benzaldehyde	03 247,000		
Benzaldehyde glyceryl acetal	07 7,500		
Benzaldehyde, tech	03 247,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Benzyl dimethyl (mixed alkyl) ammonium chloride	12	510,000
Benzyl dimethyl octadecyl ammonium chloride	12	511,000
Benzyl dimethyl oleyl ammonium chloride	12	512,000
Benzyl dimethyl (tallow alkyl) ammonium chloride	12	512,800
6-benzyladenine (bap)	13	231,251
Benzyl formate	07	15,000
1-Benzyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolium chloride	12	451,000
Benzyl hexadecyl dimethyl ammonium chloride	12	515,000
Benzyl (hydrogenated tallow alkyl) dimethyl ammonium chloride	12	516,000
2-Benzyl-2-hydroxy-5,9-dimethyl-6,7-benzomorphanhydrobromide	03	294,950
1-Benzyl-1-(2-hydroxyethyl)-2-nor (tall oil alkyl)-2-imidazole	12	453,000
Benzyl isobutyrate	07	15,400
Benzyl isopentyl ether	07	15,900
Benzyl isovalerate	07	15,700
Benzyl-methyl-bis (hydrogenated tallow) ammonium chloride	12	516,500
Benzyl (mixed alkyl) pyridinium chloride	12	516,670
1-(Benzoyloxy)-2-methoxy-4-propenylbenzene (Benzyl isoeugenyl ether)	07	16,000
Benzyl phenylacetate	07	17,000
1-Benzyl-4-phenylisonicotinitrile	03	298,200
Benzyl picolinium chloride	07	57,100
Benzyl propionate	07	18,000
1-Benzylpyridinium chloride	12	518,000
1-Benzyl quinolinium chloride	12	518,200
Benzyl salicylate	07	19,000
Benzyl (tallow alkyl) bis (2-hydroxyethyl) ammonium chloride	12	453,500
S-Benzyl thiocarbamate	13	118,071
Benzyl trimethyl ammonium chloride	12	519,000
Benzyl trimethyl ammonium hydroxide	03	300,000
Beta caseone (pro-vitamin A)	06	789,000
Betaine hydrochloride	06	614,000
Betamethasone	08	649,500
Betamethasone dipropionate	06	650,000
Betamethasone sodium phosphate	06	651,000
Beta methyl ionone coar	07	104,100
Bethanechol chloride	06	314,500
Biological stains	14	24,000
Biotin	06	794,000
4,4'-Biphenol	03	306,500
Biphenyl	03	307,000
N,N-Bis (2-acetamido) glycine	14	3,000
Bis (N-midopropyl)-N,N-dimethyl-N-ethyl ammonium ethyl sulfate dimer acid	12	467,500
N,N-Bis (2-amino-2-methyl) propyl-1,2-ethane diamine	15	259,000
2,6-Bis (p-azidobenzylidene)-4-methyl cyclohexanone	03	311,400
Bis (2-bis (2-hydroxyethyl) amino ethyl) diisopropyl titanate	15	1058,600
Bis-1,4-bromoacetoxyl-2-butene	13	176,000
Bis (2-butoxyethyl) ether (Diethylene glycol di-n-butyl ether)	15	1142,000
1,1-Bis (carboxymethyl)-2-undecyl-2-imidazolium chloride, disodium salt	12	20,000
Bis (p-chlorobenzoyl) peroxide	15	17,900
Bis (2-chloroethyl) ether (Dichloro diethyl ether)	15	1309,000
Bis (2-chloroethyl)-2-chloroethyl phosphonate	12	1017,000
Bis (coconut oil alkyl) amine	12	431,000
Bis (coconut oil alkyl) dimethyl ammonium chloride	12	480,000
Bis-cumylphenyl-oxoethylene titanate	12	775,800
1,2-Bis (3,5-di-tert-butyl-4-hydroxyhydroquinamoyl) hydrazine	15	17,980
Bis (dibutylthiocarbamoyl) disulfide	09	144,950
Bis (2,4-dichlorobenzoyl) peroxide	15	18,000
Bis (dimethylaminoethyl) ether	15	322,900
Bis (α,α-dimethylbenzyl) peroxide	15	19,000
Bis (1,3-dimethylbutyl) phosphorodithiolelyl amine salt	14	232,000
N,N'-Bis (1,4-dimethylphenyl)-p-phenylenediamine	09	55,551
S-11,2-Bis (ethoxycarbonyl) ethyl (O-dimethyl) phosphorodithioate (Malathion)	13	215,000
Bis (2-ethoxyethyl) ether (Diethylene glycol diethyl ether)	15	1143,000
Bis (2-ethylhexyl) hydrogen phosphate	15	1019,000
Bis (2-ethylhexyl) sephalate	11	16,550
N,N'-Bis (1-ethyl-3-methylphenyl)-p-phenylenediamine	09	56,000
Bis (ethyl-3-oxobutanoato) bis (2-propenolato) titanium	15	1058,800
Bis (N,N'-ethyl (stearic/arachidic/benfic) amide)	12	470,400
Cyanoethyl ethyl ammonium ethosulfate	15	19,200
2,2-Bis (terocaryol) propane	15	260,000
Bis-hexamethylenetriamine amine	15	432,000
Bis (hydrogenated tallow alkyl) dimethyl ammonium chloride	12	481,000
Bis (hydrogenated tallow alkyl) dimethyl ammonium methyl sulfate	12	482,000
N,N-Bis (2-hydroxyethyl) (coconut oil alkyl) amine	12	321,100
N,N-Bis (2-hydroxyethyl) (coconut oil alkyl) amine oxide	12	321,110
Bis (2-hydroxyethyl, ethoxylated) methyl (9-octadecenyl) ammonium chloride	12	454,000
Bis (2-hydroxyethyl, ethoxylated) methyl octadecyl ammonium chloride	12	455,000
Bis-2-hydroxyethyl-hydrogenated tallow-ethyl sulfate	12	455,500
Bis (2-hydroxyethyl) isodecyl propyl ammonium chloride	12	321,700
Bis (2-hydroxyethyl) methyl (tallow alkyl) ammonium chloride	12	455,540
N,N-Bis (2-hydroxyethyl) octadecanamide	14	489,000
N,N-Bis (2-hydroxyethyl) octadecylamine	12	322,000
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate	12	455,600
N,N-Bis (2-hydroxyethyl) (tallow alkyl) amine	12	324,000
Bis (2-hydroxyethyl) (tallow ammonium) ethanolate	12	0,500
N,N-Bis (2-hydroxyethyl)-p-toluidine	03	958,500
Bis (hydroxy-methyl) pleyl oxazoline	15	20,500
2,2-Bis (Hydroxy-methyl)-propionic acid	15	494,500
2,2-Bis (4-hydroxyphenyl) 4-methylpentane	15	20,550

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
4,6-Bis(isopropylamino)-2-methoxy-s-triazine (Prometon)	13	2-Bromo-4,6-dinitroaniline	03
2,4-Bis(isopropylamino)-6-(methylthio)-s-triazine	1118.010	Bromoethane (Ethyl bromide)	15
Bis(2-[2-(2-methoxyethoxy)ethyl] ether) (Tetraethylene glycol dimethyl ether)	13	1-Bromo-4-ethoxy-2-methylbenzene	03
Bis(2-methoxyethyl) ether (Diethylene glycol dimethyl ether)	15	Bromoethylbenzene	03
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	09	p-Bromofluorobenzene	03
N,N'-Bis(4-methylphenyl)sulfonilamine, potassium salt	03	1-Bromohexadecane	15
Bis(morpholinolcarbonyl)sulfonil disulfide	09	1-Bromohexane (n-Hexyl bromide)	15
Bismuth neodecanoate	15	2-Bromohexanoic acid	15
Bismuth subgalate	06	1-Bromo-3-methyl-2-butene	15
Bismuth subsalicylate	06	β-Bromo-β-nitrostyrene	15
Bis[2-(octadecylamido)ethyl]-N-(2-cyanoethyl)-N-ethyl ammonium ethyl sulfate	15	1-Bromo-octadecane	15
Bis(pentachloro-2,4-dicyclopentadien-1-yl)	13	1-Bromo-octadecene	15
Bis(perfluoroalkyl)bis(alpha-monochlorohydroxy) pyromellitate	15	1-Bromopentane (n-Amyl bromide)	15
Bisphenol A, etoxylated and propoxylated	12	1-Bromopropane (n-Propyl bromide)	15
Bisphenol A, ethoxylated	12	2-Bromopyridine	03
Bisphenol A, hindered	09	Bromotrifluoromethane	15
Bis(tallow alkyl)amine	09	Bromophenylamine maleate	06
Bis(tallow alkyl)dimethylammonium chloride	12	Burapropion	06
1,2-Bis(tribromophenoxy)ethane	13	Butabarbital	06
Bis(tributyltin) oxide	03	Butabarbital, sodium	06
Bis(triphenylsilyl)chromate	15	Butadiene and butylene fractions	02
Bitolyene disocyanate (TODI)	03	1,3-Butadiene, grade for rubber (Elastomers)	02
Blend of fatty and phosphate esters	12	Butabital	02
Blowing agents, acyclic, other	09	Butamben picrate	06
Blowing agents, cyclic, all other	09	1,2 (and 1,3)-Butanediol	15
Boric acid-amine adducts	15	1,4-Butanediol diglycidyl ether	15
Bornyl phenylamine	14	Butanolic acid, 1-cyclohexylethyl ester	07
Boron fluoride-phenol complex	14	Butanol, ethoxylated	12
Boron trichloride-amine complex (DY 9577)	15	2-Butanone peroxide (MEK peroxide)	15
Bromochloroethane	15	1-Butene	02
Brominated (including bromochlorinated) hydrocarbons, all other	06	1-Butene and 2-butene, mixed	02
Brominated vegetable oil	15	2-Butenedioic acid- $\{\epsilon\}$ -diamine-1-(2-aminoethyl)-2-(tall oil alkyl)-2-Imidazole condensate	12
Bromoacetic acid	15	2-Butene-1,4-diol	15
3-Bromoacetic acid	13	2,3,4,5,5'-Butenyne-tetrahydrofurfural	13
Bromacetophenone	15	Butorphanol tartrate	06
Bromobenzene mono	03	1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	15
p-Bromobenzene sulfonic chloride	03	2-Butoxyethanol [Ethylene glycol monobutyl ether]	15
o-Bromobenzonic acid	03	2-(2-Butoxyethoxy)ethanol [Diethylene glycol monobutyl ether]	15
3-(1,4'-Bromo[1,1'-biphenyl]-4-yl)-1,2,3,4-tetrahydro-1-naphthalene-4-hydroxy-2H-1-benzopyran-2-one	13	2-(2-(2-Butoxyethoxy)ethoxy)ethanol (Triethylene glycol monobutyl ether)	15
1-Bromobutane (n-Butyl bromide)	15	α-(2-(2-n-Butoxyethoxy)ethoxy)-4,5-methylenedioxy-2-propyltoluene (Piperonyl butoxide)	13
5-Bromo-3-sec-butyl-6-methylacril (Bromacril)	13	2-(2-Butoxyethoxy)ethyl acetate	15
Bromochlorodifluoromethane	15	2-Butoxyethyl acetate	15
Bromochloromethane	15	Butoxyethylene benzoate	12
2-Bromo-1-chloro-1,2-trifluoroethane	15	Butoxyethylene oxycetic acid, sodium salt	12
2-Bromo-2-chloro-1,1,1-trifluoroethane (Halothane)	15	2-Butoxyethyl oleate	11
Bromodecane (Decyl bromide)	15	n-Butyl acetate	15
2-Bromodibenzofuran	03	n-Butyl acrylchloroate	11
		Butyl acid phosphate	15
			1020.000

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sec't. Item No.	893	Chemical name	Sec't. Item No.
Butyl acrylate	15	893,000	Butyl methacrylate-ethyl methacrylate copolymer resins	08
Butyl acrylate ethyl acrylate copolymer resins	08	19,960	2-[and 3]-tert-Butyl-4-methoxyphenol [Butylated hydroxyanisole, or, BHA]	15
n-Butyl alcohol (n-Propylcarbinol)	15	848,000	p-Tert-Butyl- α -methylcrotonaldehyde	07
sec-Butyl alcohol (Methylcarbinol)	15	847,000	2-[[1-Butyl-2-methylindol-3-yl]carbonyl]benzoic acid	03
tert-Butyl alcohol (Trimethylcarbinol)	15	847,000	Butyl methyl pyrophosphate isopropoxy titanium salt octyl phosphite adduct	12
n-Butylamine, mono	12	261,000	Butylmorpholine	15
sec-Butylamine, mono	13	264,000	Butylmorpholine	12
tert-Butylamine, mono	13	265,000	Butylnaphthalenesulfonic acid, sodium salt	12
Butyl p-aminobenzoate	13	365,000	Butyl octyl phthalates	11
2-(tert-Butylamino)-4-ethylamino-6-methoxy-s-triazine	03	118,041	Butyl oleate	15
triethylamine	13	118,017	Butyl oleate, sulfated, sodium salt	15
tert-Butylaminoethyl methacrylate	15	327,455	n-Butyl perchloroformate	12
n-Butylamine	03	368,000	tert-Butyl peroxide, [Di-tert-butyl peroxide]	12
p-Butylbenzaldehyde	03	370,000	tert-Butyl peroxyacetate	15
n-Butylbenzene	03	371,000	tert-Butyl peroxyisobutalate	15
N-n-Butyl benzensulfonamide	09	0,500	tert-Butyl peroxy-2-ethylhexanoate	15
N-tert-Butyl-2-benzothiazoleulfenamide	09	25,000	tert-Butyl peroxyisobutalate	15
Butyl benzyl phthalate	11	17,000	tert-Butyl peroxyisobutalate	15
n-Butyl-4,4-bis[[1-butylperoxy]valerate	15	1284,200	tert-Butyl peroxyisobutalate	15
Butyl butyl lactate	07	127,500	tert-Butyl peroxyisobutalate	15
sec-Butyl chloroformate	15	898,000	tert-Butyl peroxyisobutalate	15
3-tert-Butyl-5-chloro-6-methyluracil	13	118,018	tert-Butyl peroxyisobutalate	15
2-tert-Butyl-p-cresol	03	377,000	o-sec-Butylphenol	03
6-tert-Butyl-p-cresol	03	380,300	p-sec-Butylphenol	03
2-tert-Butyl cyclohexanol	07	93,710	p-tert-Butylphenol	03
2-sec-Butylcyclohexanol	07	93,700	p-tert-Butylphenol-formaldehyde, alkoxylated	12
o-tert-Butylcyclohexyl acetate	07	93,800	Butylphenols, mixed	03
p-tert-Butylcyclohexyl acetate (Verbenax)	15	347,000	2-[p-tert-Butylphenoxy]cyclohexyl-2-propynyl sulfite	13
tert-Butyldiethanolamine	07	58,750	N-[3-(p-tert-butylphenyl)-2-methylpropylidene]antranilic acid, methyl ester	15
Butylene glycol adipate	11	1100,200	Butyl phosphate	07
1,3-Butylene glycol dimethacrylate	12	758,940	Butyl phosphate, potassium salt	12
Butylene oxide, ethoxylated	12	1303,000	Butyl phosphate, potassium salt	12
Butylene oxide	15	267,000	Butyl phthalyl butyl glycolate	11
n-Butylethylamine	15	21,000	Butyl picolinium bromide	12
Butyl 2-ethylhexyl phthalate	11	21,000	Butyl picoleate	11
Butyl ethyl magnesium	15	1374,800	n-Butyl stearate	11
N-Butyl-N-ethyl- α , α -trifluoro-2,6-dinitro-p-toluidine (Benefin)	13	43,000	p-tert-Butyltoluene	03
Butyl formal	15	1430,000	Butyl 2-[4-[[5-(trifluoromethyl)-2-pyridinyl]oxy]phenoxy]propanoate	13
tert-Butyl glycidyl ether	15	1317,470	tert-Butyl urea	15
tert-Butyl hydroperoxide	15	1285,000	Butyl vinyl ether	15
4,4'-Butyldienebis(6-tert-butyl-m-cresol)	09	88,200	6-tert-Butyl-2,4-xylene	03
Butyl (isobutylene-isoprene) type	10	9,000	2-Butyne-1,4-diol	15
Butyl lactate	15	900,000	Butyraldehyde	15
n-Butyllithium	15	1372,000	l-Butyraldehyde trimer	15
sec-Butyllithium	15	1373,000	Butyric acid	15
n-Butyl magnesium chloride	15	1374,900	Butyric anhydride	15
Butyl maleate	15	901,000	Butyrolactone	15
n-Butyl mercaptan (1-Butanethiol)	02	90,910	n-Butyrolactone	15
sec-Butyl mercaptan (2-Butanethiol)	02	90,915	Butyl chloride	15
tert-Butyl mercaptan (2-Methyl-2-propanethiol)	02	91,000	Cadmium benzoate	15
Butyl mercaptopropionate	15	902,800	Cadmium 2-ethylhexanoate	15
Butyl methacrylate	15	902,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Cadmium laurate	15 677-300	(1-Carboxyheptadecyl)trimethylammonium hydroxide, inner salt	12 1,000
Cadmium naphthenate	14 297,000	5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, potassium/sodium salts	12 52,500
Cadmium stearate	15 751,000	5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, reaction products with castor oil	12 38,500
Caffeine, natural	06 537,000	Carboxylic acid - alkanolamine condensates, all other	12 582,000
Caffeine, synthetic	06 538,000	Carboxylic acid amides, all other	12 588,000
Calcitonin	06 691,500	Carboxylic acid-diamine and polyamine condensate, all other	12 587,000
Calcium acetate	15 591,000	Carboxylic acid-diamine and polyamine condensates, all other	12 374,000
Calcium α -alkylcarboxylate	15 668,000	Carboxylic acid-diamine and polyamine condensates, alkoxylated, all other	12 384,000
Calcium ascorbate	06 808,000	Carboxylic acid esters, all other	12 721,000
Calcium citrate	15 622,000	Carboxylic acids, all other	12 75,000
Calcium 2-ethylhexanoate	15 632,000	Carboxylic acids with amide, ester or ether linkage, other	12 51,000
Calcium formate	15 738,000	N-Carboxy-N-methylanthranilic anhydride	03 351,400
Calcium gluceptate	06 170,000	Carboxymethyl-3-cocoamidopropyl dimethyl ammonium chloride, sodium salt	12 3,980
Calcium manganese tallowate	14 298,000	(Carboxymethyl) [3-(coconut oil amide) propyl]dimethylammonium hydroxide, inner salt	12 4,000
Calcium naphthenate	14 296,000	1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-Imidazolium hydroxide, sodium derivative, sodium salt	12 22,000
Calcium neodecanoate	15 703,000	1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-Imidazolium hydroxide, sodium derivative, sodium salt	12 22,600
Calcium oleate	15 718,500	1-Carboxymethyl-1-(2-hydroxyethyl)-2-Imidazolium hydroxide, sodium derivative, sodium salt	12 23,200
Calcium polycarboxyl	06 591,600	1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-hydroxide sodium derivative, sodium salt	12 24,000
Calcium propionate	15 737,000	1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-Imidazolium hydroxide, sodium derivative, sodium salt	12 25,000
Calcium stearate	15 752,000	1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-Imidazolium hydroxide, sodium derivative, sodium salt	12 21,300
Calcium undecylenate	06 135,000	(Carboxymethyl)-3-(lauryl amido propyl dimethyl ammonium hydroxide inner salt	12 21,400
Camphene	15 29,000	Carvacrol	07 94,300
Campholenic aldehyde	15 29,100	l-Carvone	07 94,300
Canrenoate, potassium	06 736,700	β -Caryophyllene	12 53,000
Canrenoate, potassium	07 111,500	Castor oil acids, potassium salt	12 52,000
Capramidopropyl betaine	12 0,800	Castor oil acids, sodium salt	12 669,000
Capreomycin	06 39,150	Castor oil ethoxylated	15 502,000
Capric acid (Ratio =2/1)	12 530,000	Castor oil fatty acids, dehydrated	15 1327,610
Capric acid (Ratio=1/1)	12 546,010	Castor oil hydrogenated	15 1327,620
Caprolactam (2-Oxohexamethylenimine)	15 29,500	Castor oil polyimined	12 305,000
Caprolactam magnesium bromide	15 29,505	Castor oil, sulfated, sodium salt	12 529,000
Caproactone	15 104,600	Cationic surfactant-active agents, all other	12 94,700
3-(Caprylamidoethylene-(2-hydroxyethyl) amino)propionic acid	12 0,700	Cedarwood acetate	07 94,700
Caprylamphopropionate	12 9,800	α -Cedrene epoxide (Andrane)	07 94,760
Caprylic acid tetraethylene-pentamine condensate	12 358,700	Cedrenol	07 94,780
Captopril	06 355,400	Cedrol	07 94,790
Caramphen	06 425,800	Cedryl acetate	07 94,800
Carbenicillin, disodium	06 12,000		
Carbidopa	06 830,500		
1-(Carboethoxy)ethyl 5-(2-chloro-4-(trifluoromethyl)phenoxy)-2-nitrobenzoate	13 118,068		
Carbonyldrazide	15 330,500		
2-Carboxymethoxy-1-propen-2-yl dimethyl phosphate	13 216,000		
Carbon black feedstock	02 36,050		
Carbon Black oil	01 21,010		
Carbon disulfide	15 1298,600		
Carbon tetrachloride	15 1217,000		
4,4'-Carbonylbis(phthalic anhydride)	03 400,100		
Carboplatin	06 278,100		
1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-Imidazolium hydroxide, sodium derivative, sodium salt	12 21,200		
1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-Imidazolium hydroxide, sodium derivative, sodium salt	12 21,250		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Cadyl formate	07	94, 810
Cafacolor	06	39, 300
Cafamandole	06	39, 500
Cafazolin, sodium	06	40, 000
Cafonidol	06	40, 100
Cafoxlin	06	40, 200
Ceftazidime	06	40, 500
Cefuroxime	06	40, 700
Cellulose	14	99, 500
Cellulose acetate	14	384, 000
Cellulose acetate butyrate	08	20, 980
Cellulose acetate hexahydrophthalate	15	29, 900
Cellulose acetate phthalate	15	30, 000
Cellulose acetate propionate	08	21, 010
Cellulose ethers and esters, all other	14	613, 000
Cellulose, oxidized	06	1430, 250
Celtone	06	41, 000
Cephalothin, sodium	06	43, 600
Cephadrine	06	43, 800
Cerium 2-ethylhexanoate	15	632, 200
Cetylalcolyl methacrylate	15	911, 700
Cetyl lactate	15	912, 000
Cetylpyridinium chloride	06	80, 000
Chemical indicators	14	71, 000
Chemically defined linear alcohol, alkoxylated, all other	12	79, 000
Chemical reagents and fine chemicals	12	82, 000
Chlorinated fatty materials	15	1327, 700
Chlorinated (Not otherwise halogenated) hydrocarbons, all other	15	1252, 000
Chlorinated insecticides, cyclic, all other	13	147, 000
Chlorinated paraffins, 55-64% chlorine	15	1219, 000
Chlorinated paraffins, less than 35% chlorine	15	1218, 000
Chlorinated paraffins, 65% or more chlorine	15	1220, 000
Chlorinated rubber, natural and synthetic	10	9, 050
Chloroacetic acid, mono	15	503, 000
2-Chloroacetophenone	03	411, 100
Chloroalkyl diposphate ester, neutral	15	1021, 700
Chloroalkyl phosphate ester	15	1021, 702
2-Chloroalkyl diethyldithiocarbamate (CDEC)	13	198, 000
1-(3-Chloro-allyl)-D-3,5,7-triazia-1-azoniaadamantane chlori	03	413, 300
2-Chloro-4-aminotoluene	03	412, 500
o-Chloroaniline	03	414, 000
p-Chloroaniline	03	415, 000
p-Chlorobenzaldehyde	03	425, 000
Chlorobenzene, mono	03	427, 000
p-Chlorobenzene, sulfonic acid	03	430, 000
5-Chlorobenzotriazole	14	329, 000
2-Chloro-4,6-bis(ethylamino)-8-triazine (Simazine)	13	44, 050
1-Chloro-4,6-bis(isopropylamino)-8-triazine (Propazine)	13	44, 100
2-Chlorobutane (n-Butyl chloride)	15	1221, 000
2-Chloro-1,4-dibutoxybenzene	03	440, 780
1-Chloro-2,5-dibutoxy-4-nitrobenzene	03	440, 803
2-Chloro-1,4-diethoxybenzene	03	440, 900
1-Chloro-2,5-diethoxy-4-nitrobenzene	03	441, 000
2-Chloro-2',6'-diethyln-N-(methoxymethyl)acetanilide (Butachlor)	13	44, 160
2-Chloro-2',6'-diethyln-N-(methoxymethyl)acetanilide (Alachlor)	13	44, 180
1-Chloro-1,1-difluoroethane (F-142b)	13	44, 180
Chlorodifluoromethane (F-22)	15	1255, 000
4-Chloro-2',5'-dimethoxyacetanilide	03	448, 000
1-Chloro-1,4-dimethoxybenzene	03	451, 200
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	03	453, 000
4-Chloro-3,5-dinitrobenzenesulfonic acid	03	456, 100
2-Chloro-N-(2,6-dinitro-4-(trifluoromethyl)phenyl)-N-ethyl-6-fluorobenzene methanamine	13	168, 135
3-Chlorodiphenylamine	03	457, 000
2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)acetamide (Acetochlor)	13	44, 190
2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene (Oxyfluorfen)	13	118, 044
2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (Atrazine)	13	45, 000
2-(4-Chloro-6-(ethylamino)-s-triazin-2-ylamino)-2-methylproprionitrile (Cyanazine)	13	45, 100
p-(2-Chloroethyl)methylamino)benzaldehyde	03	463, 000
2-(Chloroethyl)phosphonic acid	13	231, 250
Chloroform	15	1224, 000
Chloroethoxypropyl methacrylate	15	912, 200
2-Chloro-N-isopropylacetamide (Propachlor)	13	45, 200
Chloromethane (Methyl chloride)	15	1226, 000
1-Chloro-2-methoxyethane	15	1306, 600
2-Chloro-N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino)carbamoyl)benzenesulfonamide	13	118, 054
Chloromethyl dimethyliminium (Amide chloride)	15	231, 700
Chloromethyl methyl ether	15	1307, 000
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt	13	109, 011
4-Chloro-2-methylphenoxyacetic acid, iso-octyl ester, dimethylamine salt	13	109, 011
2-(4-Chloro-2-methylphenoxy)propionic acid, dimethylamine salt	13	118, 048
1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	03	495, 000
1-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	03	498, 000
2-Chloro-4-nitrobenzoic acid	03	506, 000
2-Chloro-4-nitrobenzoic acid potassium salt	03	508, 030
4-Chloro-3-nitrobenzotrifluoride	03	508, 100
4-Chloro-4-nitrotoluene	03	512, 000
Chloropentafluoroethane	15	1257, 000
5-Chloropentafluorobenzene	15	811, 000
2-Chlorophenothiazine	15	811, 000
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)butan-2-one	03	519, 000
α-(2-Chlorophenyl)-ω-(4-chlorophenyl)-5-pyrimidinemethanol	13	40, 009
N-(4-Chlorophenyl)-N-(3,4-dichlorophenyl)urea	13	40, 020
4-Chloro-o-phenylenediamine	03	523, 100
	03	523, 000

Table D-1—Continued
Alphabetical chemical index

<i>Chemical name</i>	<i>Sect. Item No.</i>	<i>Sect. Item No.</i>
α -[2-(4-chlorophenyl)ethyl]- α -(1,1-dimethyl)ethyl)-1h-1,	13	40, 028
2-flazole-1-ethanol	13	40, 019
α -(2-Chlorophenyl)- α -(4-fluorophenyl)-5-pyrimidinemethanol	13	168, 994
β -(4-Chlorophenyl)methyl-%-(1,1-dimethyl)ethyl)-1,2,4-triazole-1-ethanol	13	118, 087
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolone	13	528, 000
4-Chlorophthalic acid	03	812, 320
1-Chlorophthalone	15	1076, 000
3-Chloro-1,2-propanediol (Glycerol α -chlorohydrin)	15	1229, 000
3-Chloropropene (Allyl chloride)	15	1379, 000
α -Chloropropyltrichlorosilane	15	1380, 000
Chloropropyltrimethoxysilane	03	530, 070
3-Chloropropyl-2,5-xylol ether	03	532, 000
2-Chloropyridine	03	537, 000
4-Chlororesorcinol	10	9, 100
Chlorosulfonated polyethylene (CSM) type	03	539, 200
2-(4-Chlorosulfonylphenyl)ethyltrichlorosilane	14	197, 000
Chlorosulfurized sperm oil	15	1257, 500
2-Chloro-1,1,1,2-tetrafluoroethane	15	34, 600
Chlorothiazanthone	06	719, 000
Chlorothiazide	03	543, 000
α -Chlorotoluene	03	545, 000
α -Chlorotoluene (Benzyl chloride)	03	543, 000
3-Chloro-p-toluidine [NH ₂ =1]	03	547, 000
2-Chloro-6-(trichloromethyl)pyridine	13	168, 991
Chlorotrifluoroethylene (Trifluorovinyl chloride)	15	1258, 000
2-Chloro-1,1,2-trifluoroethyl methyl ether	15	1259, 200
Chlorotrifluoromethane (F-13)	15	1259, 000
2-Chloro-N-[[1,4-(trifluoromethoxy)phenyl]amino]carbonylbenzamide	13	133, 200
3-(2-Chloro-4-trifluoromethylphenoxy)toluene	03	556, 050
Chlorotrimeethylsilane	15	1381, 000
4-Chloro-3,5-xylanol	03	565, 000
Chloropheniramine	06	88, 500
Chloropheniramine maleate	06	89, 000
Chloropheniramine tannate	06	883, 800
Chlorpromazine	06	687, 000
Chlorpromazine hydrochloride	06	687, 000
Chlorpropamide	06	31, 000
Chlorotetracycline (medicinal grade)	06	64, 000
Chlorotetracycline (animal feed grade)	06	64, 000
Cholesterics and hydrocholesterics, all other	06	604, 000
Cholesterol esterase	14	110, 000
Cholesterol oxidase	14	112, 000
Choline	06	612, 001
Choline bicarbonate	15	342, 000
Choline bitartrate	06	608, 000
Choline chloride (animal feed grade)	06	607, 000
Choline chloride (medicinal grade)	06	608, 000
Choline citrate	06	610, 000
Choline magnesium citrate	06	611, 000
Choline magnesium salicylate	06	385, 300
Choline salicylate	06	399, 300
Chromium 2-ethylhexanoate	15	632, 500
Chromium naphthenate	14	299, 000
Chromium octanoate, activated, catalyst	15	1371, 150
Cimetidine	06	619, 400
Cimetidine hydrochloride	06	619, 600
Cineole (Eucalyptol)	07	23, 700
Cinnamaldehyde	07	24, 000
Cinnamotrilite	15	34, 780
Cinnamyl acetate	07	25, 000
Cinnamyl alcohol	07	26, 000
Cinnamyl butyrate	07	27, 100
Cinnamyl chnamate	07	27, 200
Cinnamyl nitrile	07	27, 500
Cinnamyl propionate	07	28, 000
Cinoxacin	06	276, 002
Cis-1-(3-Chloro-allyl)-3,5,7-triaza-1-azoniaadamantane chlor	03	413, 500
Cisplatin	06	278, 200
Citral dimethyl acetal	07	127, 700
Citric and acetylcitric acid esters, all other	11	71, 000
Citric acid	15	505, 000
Citric acid, sodium salts (50%) in sodium phosphates (20%)	15	53, 500
Citronellyl acetate	12	128, 000
Citronellyl formate	07	130, 000
Citronellyl isobutyrate	07	131, 000
Citronellyl propionate	07	131, 500
Clindamycin	06	45, 000
Clorsulon	08	116, 500
Cloxacillin, sodium	08	13, 000
Cobalt acetate	15	593, 000
Cobalt t- α -alkylcarboxylate	15	689, 000
Cobalt borate neodecanoate complexes	09	180, 300
Cobalt borocylate	15	1371, 600
Cobalt 2-ethylhexanoate	15	633, 000
Cobalt manganese acetate	15	593, 010
Cobalt manganese tallate	15	172, 010
Cobalt naphthenate	14	301, 000
Cobalt neodecanoate	15	705, 000
Cobalt-potassium 2-ethylhexanoate	15	693, 010
Cobalt stearate	15	753, 000
Cobalt tallate	15	172, 000
Cocaine	06	701, 500
N-Cocaoalkyl-1,3-propylenediamine acetate	13	245, 011
Cocoamidopropylglycolate	12	9, 250
N-(Cocoamidopropyl;N'-acetic acid) ammonium salt	12	462, 600
Cocoamidopropyl betaine	12	9, 255
Cocoamidopropyl dimethyl amine	12	328, 300
Cocoamidopropyl dimethyl amine oxide	12	385, 280
N-Cococamido-propyl-N,N-dimethylamine oxide	12	9, 580
3-[3-(Cococamidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	12	9, 600
3-Cococamidopropyl-2-hydroxy-3-sulfolpropyldimethyl ammonium hydroxide, inner salt	12	9, 700

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Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Cocooamphocarboxylglycinate	12 9,260	Copper 1- α -alkylcarboxylate	15 669,050
Cocooamphocarboxypropionate	12 9,265	Copper 2-ethylhexanoate	15 634,000
Cocooamphopropionate	12 9,280	Copper gluconate	06 762,000
Cocodimethyl ethyl ammonium ethyl sulfate	12 482,750	Copper naphthenate	14 302,000
Coconut fatty acid-ethoxylated nonylphenol ester	12 758,970	Copper oleate	15 718,000
Coconut oil acids	12 569,000	Copper [2,2',2'',2''',-(29H,31H- phthalocyanine)pentakis(methylene)]pentakis(1H- isindole-1,3(2H)-dionato]]	03 568,603
Coconut oil acids (Ratio = 1/1)	12 564,000	Corr oil acids, potassium salt	12 56,000
Coconut oil acids (Ratio = 2/1)	12 532,000	Corr oil acids, sodium salt	12 57,000
Coconut oil acids (Ratio = 1/1)	12 546,000	Corticosteroids, all other	06 670,000
Coconut oil acids (Ratio = 2/1)	12 556,000	Corticotropin	06 692,000
Coconut oil acids	12 554,000	Cortisone acetate	06 653,000
Coconut oil acids, diethanolamine salt	12 29,100	Coumarin	07 29,000
Coconut oil acids-dimethylaminopropylamine condensate (amine/acid ratio = 1/1)	12 586,480	Coumarone-Indene resins	08 22,000
Coconut oil acids-N,N-dimethyltrimethylenediamine condensate	12 360,000	Creosote oil (Dead oil): creosote content in solution (100 Percent basis)	01 21,000
Coconut oil acids-ethanolamine condensate, ethoxylated	12 576,000	Creosote oil (Dead oil): creosote in coal tar solution (100 Percent solution basis)	01 20,000
Coconut oil acids-ethanolamine salt, sulfated,potassium salt	12 29,200	Creosote oil (Dead oil): distillate as such (100 Percent creosote basis)	01 19,000
Coconut oil acids and oleic acid, potassium salt	12 248,000	m-Cresol	03 569,000
Coconut oil acids, potassium salt	12 54,000	p-Cresol	03 572,000
Coconut oil acids, sodium salt	12 55,000	o-Cresol, from petroleum	03 571,000
Coconut oil acids, 2-sulfoethyl ester, sodium salt	12 198,000	(m,p)-Cresol, from petroleum	03 574,000
Coconut oil acids, triethanolamine salt, sodium salt	12 29,000	Creosulfonic acid, formaldehyde condensate	15 34,830
N-(Coconut oil acyl)-N-methylaurine, sodium salt	12 183,000	m-Cresyl acetate	06 258,500
N-(Coconut oil acyl)sarcosine, sodium salt	12 40,000	Crésylic acid [Less than 75 percent distilling over 215° C]	02 12,000
Coconut oil alcohol, ethoxylated	12 735,000	Crésylic acid, refined: from petroleum	03 580,000
3-[[Coconut oil alkyl]amidoethylene-(2-hydroxyethyl) amino]propionic acid	12 10,130	Cratonaldehyde	15 786,000
(Coconut oil alkyl)amine	12 418,000	Cratonic acid (2-Butenonic acid)	15 506,000
(Coconut oil alkyl)amine acetate	12 392,000	Crude acetate mixture [Linyl,myr,geranyl acetates, main components]	07 162,100
(Coconut oil alkyl)amine, ethoxylated	12 326,000	Crude coal tar	01 0,500
(Coconut oil alkyl)amine, ethoxylated, acetate	12 327,100	Crude coal tar solvent	01 22,030
(Coconut oil alkyl)amine, ethoxylated and phosphated	12 327,000	Crude light oil	01 1,000
(Coconut oil alkyl)amine, propoxylated	12 327,550	Crude tar, acid oils having a tar acid content of: 5 Percent or less than 24 percent	01 15,000
N-[[Coconut oil alkyl]amino]butyric acid, sodium salt	12 483,000	Cumene (Isopropylbenzene)	03 581,000
(Coconut oil alkyl)bis(2-hydroxyethyl, ethoxylated)- methylammonium chloride	12 456,000	Cumene hydroperoxide	13 35,000
(Coconut oil alkyl)-bis-(hydroxyethyl)methyl ethoxylated mono-(2-carboxyethyl)ether methyl sulfate, potassium salt	12 456,025	Cumene sulfonic acid	03 585,500
N-(Coconut oil alkyl)trimethylenediamine	12 407,000	Cumensulfonic acid, ammonium salt	12 144,100
Coconut oil amide	15 232,000	Cumyl acetate	07 29,300
Coconut oil, ethoxylated	12 669,200	o-Cumyl peroxydecanoate	15 35,400
Coconut oil, sulfated, sodium salt	12 306,000	Cumyl phenolate isopropoxy titanium salt	12 736,500
Coconut oil and tallow acids (Ratio = 2/1)	12 333,000	4-Cyanoacetyl morpholine	15 438,500
Codine	06 269,950	Cyanoacetyl morpholine (pharmaceutical grade)	03 592,000
Cod oil, sulfated, sodium salt	12 298,750	1-(2-Cyanoethyl)ethanes dithiuron	08 798,000
Cod oil, sulfated, sodium salt	12 298,750	Cyano(4-fluoro-3-ethylphenyl)methyl-3-(2,2- dichloroethyl)-2,2-dimethylcyclopropanecarboxylate	15 349,000
Complex glycerol esters, all other	02 674,500		
Complex glycerol esters and polymeric plasticizers, all other	12 651,000		
Copolyurethane urea	11 132,000		
Copper acetate	14 386,000		
	15 594,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
N-Cyano-s-methyl-N-2(4-methyl-5-imidazolyl)methylthioethylsulfourea	03	584, 213
Cyano-3-phenoxycybenzyl-clis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	13	166, 049
Cyano(3-phenoxycyclohexyl)methyl-4-chloro- α -(1-methylethyl)benzeneacetate	13	166, 024
Cyanuric acid	15	36, 000
Cyclic amphoteric surface-active agents, all other	12	28, 000
Cyclic chemicals, all other	10	218, 000
Cyclic elastomers, all other	10	6, 000
Cyclic fungicides, all other	13	40, 000
Cyclic herbicides, all other	13	118, 000
Cyclic insecticides, all other	13	166, 000
Cyclic intermediates, all other	03	154, 000
Cyclic plasticizers, all other	11	38, 250
Cyclic silazane	15	39, 250
Cyclohexazine hydrochloride	03	476, 500
Cyclohexane	03	586, 000
Cyclohexane carbonitrile	15	36, 280
1,4-Cyclohexanedicarboxylic acid	13	588, 100
1,2-Cyclohexanedicarboxylic acid anhydride	03	588, 000
Cyclohexane dimethanoid glycidyl ether	15	36, 301
Cyclohexanesulfuric acid (Cyclamate acid)	07	82, 000
Cyclohexanesulfuric acid, sodium salt (sodium cyclamate)	07	84, 000
Cyclohexanetriol	15	36, 800
Cyclohexanol	03	589, 000
Cyclohexanone	03	590, 000
Cyclohexanone oxime	03	591, 000
Cyclohexanone oxime	03	592, 000
4-Cyclohexene-1,2-dicarboxylic anhydride	03	594, 000
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl C ₈ H ₁₆ O ₂	15	39, 500
Cyclohexene oxide	03	594, 100
β -(1-Cyclohexenyl)ethylamine	03	594, 296
Cycloheximide	06	65, 000
Cyclohexylamine	03	595, 000
N-Cyclohexyl-2-benzothiazolesulfenamide	09	26, 000
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-1,2,4-triazine-1,3,5-triazine-	13	118, 019
1,2-(H ₂ H)-dione	15	41, 000
2-Cyclohexylmethoxyethanol	03	41, 200
Cyclohexylmethacrylate	15	597, 300
Cyclohexylmethyldimethylsilane	03	597, 000
N-Cyclohexyl-N-phenyl-p-phenylenediamine	09	58, 000
N-(Cyclohexylthio)phthalimide	09	124, 250
Cyclooctadiene	03	597, 800
Cyclopentane	02	11, 000
Cyclopropene carboxylic acid, 3-(2-chloro-3,3-trifluoro-1-propenyl)-2,2-dimethyl-(2-methyl[1,1-biphenyl]-3-yl) methyl ester	03	601, 500
α -Cyclopropyl- α -(p-methoxyphenyl)-5-pyrimidine methanol (Anycrimol)	13	168, 140
2-Cyclopropylmethylamino-5-chlorobenzophenone	03	601, 780
2-(N-Cyclopropylmethyl-N-phthalimidocetyl)-amino-5-chlorobenzophenone	03	601, 800
Chemical name	Sect. Item No.	Sect. Item No.
N-cyclopropyl-1,3,5-triazine-2,4,6-triazine	13	166, 048
Cycloserine	06	5, 000
Cyclools	02	4, 010
p-Cymene	03	602, 000
Cypermethrin	13	166, 029
Cyproheptadine hydrochloride	06	91, 000
Cytarabine	06	278, 300
Danazol	15	602, 500
Decabromodiphenyl ether (DBDP)	05	43, 005
Trans-Decahydro- β -naphthol	07	29, 700
Trans-Decahydro- β -naphthyl acetate	07	29, 710
Decanal (Capraldehyde)	07	132, 000
1-Decanamine, N,N-dodecyl	12	432, 850
n-Decane	15	1337, 000
1-Decanol	15	850, 500
Decanoyl chloride	15	507, 000
Decanoyl peroxide	15	1291, 000
Decyl acetate	07	132, 500
Decyl alcohol, ethoxylated	12	727, 000
Decyl alcohol, ethoxylated and phosphated	12	76, 200
Decyl alcohol, ethoxylated and propoxylated	12	727, 010
Decyldiphenyl oxide	03	603, 000
Decyl mercaptans	02	92, 500
Decyltriflate	15	438, 300
Decyl and octyl alcohols, ethoxylated	12	736, 000
Decyl and octyl alcohols, ethoxylated and propoxylated	12	736, 100
Decyl and octyl phosphate	12	92, 000
Decyl and octyl sulfate, sodium salt	12	217, 000
Decyl oleate	11	90, 300
Decyloxy(ethyleneoxy)ethyl chloride	12	728, 000
Decyl polyphosphate, sodium salt	12	95, 000
Decyl sulfate, sodium salt	12	18, 000
Demeclocycline	06	32, 000
Dexamethasone	06	654, 000
Dexamethasone sodium phosphate	06	655, 000
Dexbrompheniramine maleate	06	92, 000
Dexpanthenol	06	789, 000
Dextran	06	637, 000
Dextroamphetamine	06	517, 000
Dextroamphetamine sulfate	06	514, 000
Dextromethorphan hydrobromide	06	430, 000
3-Diacetoxyethylaminobenzenesulfonamide	03	605, 600
Di-N- β -acetoxyethyl-m-toluidine	03	605, 900
Diagnostic agents, other than roentgenographic contrast media, all other	06	582, 000
Dialkylbenzene	03	608, 200
Dialkyldithiocarbamic acid derivative	09	127, 950
Di(C ₅ -C ₆ alkyl)naphthalenesulfonic acid	12	162, 500
Diallylamine	15	258, 100
N,N-diallyl-2,2-dichloroacetamide	15	175, 013
Diallyldimethyl ammonium chloride	15	349, 200
Diallyl isophthalate	08	4, 030
Diallyl maleate	15	913, 000
Di-amine derivatives of dimer acids	15	349, 300

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Diamines and polyamines, all other	12	Diethylthiocarbamic acid, diphenylguanidine salt	09
1,3-Diaminocyclohexane	417,000	Diethylthiocarbamic acid, nickel salt	126,100
4,4'-Diaminodiphenyl ether	618,100	Diethylthiocarbamic acid, sodium salt	128,000
4,4'-Diaminodiphenyl sulfone	45,840	Diethylthiocarbamic acid, zinc salt	130,000
2,6-Diaminopyridine	629,100	Di- <i>tert</i> -butylethyldiamine	267,800
Diammonium dithiodiglycolate	634,000	Diethyl hydrogen phosphite	1023,000
Di- <i>tert</i> -amyl-phenyl acid phosphate	627,400	2,5-Di- <i>tert</i> -butylhydroquinone	15
2,5-Dianilino- <i>tert</i> -phthalic acid	657,000	D- <i>n</i> -butylmagnesium	15
Diarylenediamines, mixed	59,000	Dibutyl maleate	1374,200
Diazirone, sodium	640,000	Dibutylnaphthalenesulfonic acid	916,000
1,8-Diazabicyclo (5,4,0)undecane	564,000	1,1-Bi(<i>tert</i> -butyl peroxy) cyclohexane	12
Diazepam	46,600	Dibutylnaphthalenesulfonic acid	12
1,4-Diazobicyclo(2,2,2)octane	45,000	Di(sec-butyl)peroxydicarbonate	15
4-Diazo-2,5-diethoxymorpholinobenzene	499,000	1,1-Bi(<i>tert</i> -butyl peroxy)-3,3,5-trimethyl cyclohexane	15
Diazoxide	47,000	2,4-Di- <i>tert</i> -butylphenol	15
2,5-Di(benzoyl peroxy)-2,5-dimethylhexane	335,500	2,6-Di- <i>tert</i> -butylphenol	03
Dibenzoyl tartaric acid	49,000	2,6-Di- <i>tert</i> -4-sec-butylphenol	03
Dibenzylamine	49,000	2,6-Di- <i>tert</i> -4-sec-butylphenol	03
Dibenzylammonosuccinic acid	40,000	2,4-Di- <i>tert</i> -butyl phenyl 3,5-di- <i>t</i> -butyl hydroxybenzoate	15
Dibenzylthiocarbamic acid, sodium salt	653,500	N,N'-Di-sec-butyl- <i>p</i> -phenylenediamine	14
Dibenzylthiocarbamic acid, zinc salt	9,000	Dibutyl phthalate (including disubutyl phthalate)	11
N,N-Dibenzylhydroxylamine	10,000	Dibutyl propylphosphate	15
m-Dibromobenzene	478,000	Dibutyl sebacate	11
p-Dibromobenzene	658,000	Dibutyltin bis(butylmaleate)	11
1,1-Dibromo-2,2-dichloroethyl dimethyl phosphate	659,000	Dibutyltin bis(isobutyromercaptoproacetate)	15
(<i>n</i> -Heed)		Dibutyltin bis(mercaptolaurate)	15
1,2-Dibromo-2,4-dicyanobutane	217,000	Dibutyltin malate	15
Dibromodifluoromethane	405,000	Dibutyltin oxide	15
1,2-Dibromo-4,4-dicyanobenzene	186,000	Dibutyltin sulfide	15
3,5-Dibromo-4- <i>tert</i> -butylbenzene	659,300	N,N'-2-Di-carboxyethyl)-N-octadecylsulfosuccinamic acid, tetracetic borate	09
Bromoneopentyl glycol ether	118,031	Dicacothol borate, di- <i>o</i> -tolylguanidine salt	12
Bromoneopentyl glycol	1317,485	Dichlorophenazone	08
2,2-Dibromo-3-nitropropionamide	1077,500	2,2-Dichloroacetyl chloride	09
2,6-Dibromo-4-nitroaniline	233,500	3,4-Dichloroacetyl chloride	06
2,4-Dibromo-6-nitro- <i>m</i> -cresyl methyl ether	660,100	3,6-Dichloro-2-anisic acid (Dicamba)	13
Dibucaine hydrochloride	29,750	o-(and <i>p</i>)-Dichlorobenzene	03
Dibucaine hydrochloride (DBB)	702,000	m-Dichlorobenzene	03
Di(2-(2-butoxyethoxy)ethyl) adipate	703,000	p-Dichlorobenzene	03
Dibutoxyethyl adipate	665,100	3,3'-Dichlorobenzidine base and salts	03
Di(2-butoxyethyl) phthalate	59,200	2,6-Dichlorobenzotrifluoride	03
Dibutoxyethyl sebacate	11	2,4-Dichlorobenzylidene(mixed alkyl)ammonium chloride	03
2,5-Dibutoxy-4-morpholinobenzene	24,000	2,4-Dichloro-6-(<i>o</i> -chloroanilino)- <i>s</i> -triazine	12
(DBB Sulfate)	111,900	2,2-Dichloro-1,1-difluoroethyl methyl ether	13
2,5-Dibutoxy-4-morpholinonitrobenzene	666,100	Dichlorodifluoromethane (F-12)	15
Di- <i>n</i> -butylamine	666,200	1,4-Dichloro-2,5-dimethoxybenzene (Chloroneb)	13
4,4'-Di-sec-butylaminodiphenylmethane	262,000	1,3-Dichloro-5-dimethylxanthol	15
2-Dibutylaminoethanol	156,000	Dichlorodimethylsilane	15
Dibutylaminomethanol	350,000	Dichlorodimethylsilane	03
Dibutyl butylphosphonate	350,500	1,2-Dichloroethane (Ethylene dichloride)	03
Dibutyl- <i>p</i> -cresol	1022,000	2,6-Dichloro-3-methylaniline	03
2,6-Di- <i>tert</i> -butyl- <i>p</i> -cresol (BHT, or, Butylated hydroxytoluene)	666,600	Dichloromethylphenylsilane	03
2,5-Di-sec-butylidicylhydroquinone	51,000	Dichloromethylphenylsilane	15
Di- <i>tert</i> -butyl diperoxyphthalate	88,400		
Di- <i>tert</i> -butyl disulfide	53,200		
	92,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Dichloromethylstyliene	15	1384.000
2,6-Dichloro-4-nitroaniline	03	697.000
1,2-Dichloro-4-nitrobenzene	03	698.000
2,4-Dichloro-4-(2-nitro-4-trifluoromethylphenyl) ethanamine salt	03	701.000
2,4-Dichlorophenoxyacetic acid (2,4-D)	13	86.000
2,4-Dichlorophenoxyacetic acid 2-butoxyethyl ester	13	87.000
2,4-Dichlorophenoxyacetic acid n-butyl ester	13	89.000
2,4-Dichlorophenoxyacetic acid sec-butyl ester	13	90.000
2,4-Dichlorophenoxyacetic acid dimethylamine salt	13	91.000
2,4-Dichlorophenoxyacetic acid ethanamine and isopropanolamine salts	13	92.000
2,4-Dichlorophenoxyacetic acid iso-octyl ester	13	95.000
2,4-Dichlorophenoxyacetic acid isopropyl ester	13	96.000
2-(2,4-Dichlorophenoxy)propionic acid, dimethylamine salt	13	118.052
2-(2,4-Dichlorophenoxy)propionic acid, isoctyl ester	13	118.060
3-(3,4-Dichlorophenyl)-1,1-dimethylurea (Duron)	13	53.000
O-(2,4-Dichlorophenyl) O-ethyl S-propyl phosphorodithiolate	13	165.013
3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea (Lunuron)	13	54.000
2-(3,4-Dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione (Methazole)	13	118.036
1-(1-(2,4-Dichlorophenyl)-4-propyl-1,3-dioxolan-2-ylmethyl)-1H-1,2,4-triazole	13	118.065
2-(3,5-Dichlorophenyl)-2-(2,2-trichloroethyl)oxirane (tri)	13	118.069
3,6-Dichloropicolinic acid	13	118.077
1,3-Dichloro-2-propanol	15	1296.750
1,3-Dichloropropene	13	238.000
2,3-Dichloropropene	15	1236.000
3,4'-Dichloropropanilide (Propanil)	13	56.000
2,6-Dichloropyridine	03	703.500
3,7-Dichloro-8-quinolic Acid	13	118.070
Dichlorotetrafluoroethane (F-114)	15	1263.000
Dichloro-trifluoroethane (F-123)	03	708.000
p,α-Dichlorotoluene	03	727.000
Dichloro-trifluoroethane	06	117.000
Dicloxacillin, sodium	06	14.000
Dicresylphosphorodithioic acid	14	130.000
Dicresylphosphorodithioic acid, ammonium salt	14	131.000
Dicresylphosphorodithioic acid, sodium salt	14	132.000
Dicumaryl	06	625.000
Dicumyl peroxide	15	96.500
Dicyanamide	03	710.700
Dicyanamide resins	06	4.050
Dicyanodiamide formaldehyde ammonium chloride polymer	14	477.000
Dicyclohexylamine	03	712.000
Dicyclohexyl phthalate	03	37.000
Dicyclopentadiene (Includes Cyclopentadiene)	03	714.000
Dicyclopentadienylchromium (Chromocene)	15	67.800
Didecyl adipate	15	917.000
Didecyl dimethylammonium chloride	12	483.500
2,5-Di-(1,1-dimethylpropyl)hydroquinone	09	89.000
Didodecylbenzenesulfonic acid, sodium salt	14	137.000
Diesel fuel additives acyclic, all other	12	151.000
Diesel fuel additives, cyclic, all other	14	152.000
Diethanolamine	15	380.000
Diethanolamine-borate	15	1368.300
Diethanolamine condensate, all other	12	555.000
Diethanolamine condensates (Amine/acid = 2/1), all other	12	545.000
Diethanolamine condensates, amine/acid ratio=1/1, all other	12	553.000
α,α-Diethoxyacetophenone	03	716.200
p-Diethoxybenzene	03	718.000
Diethoxyethane	15	1308.500
2,5-Diethoxy-4-morpholinobenzediazonium chloride	14	338.000
2,5-diethoxy-4-morpholinotrobenzene	03	666.250
Diethyl acetal	07	132.700
Diethylaluminum chloride	15	1356.000
Diethyl aluminum ethoxide	15	1356.200
Diethylaluminum iodide	15	1357.000
Diethylamine	15	277.000
p-(Diethylamino)benzaldehyde	03	721.000
p-(Diethylamino)benzaldehyde, 1,1-diphenylhydrazone	03	721.500
p-Diethylaminobenzediazonium chloride (p-Diazo-N,N-diethylaniline zinc chloride)	14	340.000
2-Diethylaminoethanol (N,N-Diethylethanolamine)	15	355.000
2-(2-Diethylaminoethoxy)ethanol	15	356.000
Diethylaminoethylacrylate, dimethyl sulfate, quaternary salt	15	357.100
2-Diethylaminoethyl methacrylate	15	358.000
2-[4-Diethylamino-2-hydroxybenzyl]benzyl alcohol	03	722.503
4-(Diethylamino)-2-methylbenzaldehyde	03	723.500
3-Diethylamino-6-methyl-7-(2,4-dimethylamino) fluoranone	15	57.280
o-(2-Diethylamino)-6-methyl (4-pyrimidinyl) o,o-dimethyl phosphorothioate	13	152.600
m-(Diethylamino)phenol (N,N-Diethyl-3-aminophenol)	03	724.000
3-(Diethylamino)propophenone	03	725.000
N,N-Diethylaniline	03	727.000
2,6-Diethylaniline	03	727.200
Diethylbenzene	03	729.000
Diethylcarbamazoyl citrate	06	118.000
Diethylcarbamoyl chloride	15	359.000
Diethyl carbonate (Ethyl carbonate)	15	922.000
N,N-Diethylcyclohexylamine	03	730.000
O,O-Diethyl O-(2-diethylamino-6-methyl-4-pyrimidinyl) phosphorothioate	13	166.034
3,5-Diethyl-1,2-dihydro-1-phenyl-2-propylpyridine	03	739.600
N,N-Diethyl-N,N'-diphenylurea	15	57.400
Diethylthiocarbamic acid, cadmium salt and bis(diethylthiocarbamoyl)cadmate	09	132.000
Diethylthiocarbamic acid, sodium salt	08	135.000
Diethylthiocarbamic acid, tellurium salt	09	136.000
Diethylthiocarbamic acid, zinc salt	09	137.000
N,N-Diethylhydroxycanamide	15	235.000
Diethylsene glycol	15	1153.000
Diethylsene glycol adipate	15	1100.800

Table D-1—Continued
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Chemical name	Sect. Item No.	No.	Chemical name	Sect. Item No.	No.
Dibutyl- <i>o</i> -cresol	03	777, 200	3-(Dimethoxyphosphoryloxy)-N,N-dimethyl-cis- crotonamide	13	222, 000
Diodomethane (Methylene iodide)	15	1277, 000	1, 2-Dimethoxy-4-propenylbenzene	07	30, 000
Disobutyl adipate	11	61, 000	(4-Propenylacetate)	15	236, 000
Disobutyl aluminum chloride	15	1358, 000	N,N-Dimethylacetamide	13	236, 500
Disobutyl aluminum hydride	15	263, 000	O,S-Dimethylacetylphosphoramidothioate (Acephate)	15	222, 500
Disobutyl dimethylhydrochloro silane	15	1385, 200	Dimethyl adipate	11	63, 225
Disobutylene (DI-isobutene)	02	74, 000	N,N-Dimethyl-N-alkylamine phosphate	12	393, 200
Disobutylene isobutene	12	1337, 200	Dimethyl- α -naphthol	07	102, 100
Disobutylene isobutene	12	707, 000	Dimethylamine	15	288, 000
Disobutyl phenol, ethoxylated	11	742, 900	Dimethylamine epichlorohydrin copolymer	15	364, 750
Disodecyl adipate	11	62, 000	Dimethylamine epichlorohydrin ethylene diamine copolymer	15	417, 000
Disodecyl phthalate	11	30, 050	p-(Dimethylamino)benzaldehyde	14	795, 250
Disononyl peroxide	15	1293, 570	p-Dimethylamino benzene diazoniium chloride (p-Diazo-N,N- dimethylaniline zinc chloride)	03	346, 000
Disononyl adipate	11	62, 500	m-(Dimethylamino) benzoic acid	14	346, 000
Disononyl phthalate	11	30, 100	2-(4-(Dimethylamino)benzoyl)benzoic acid	03	796, 000
Diso-octyl adipate	11	63, 000	2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	15	366, 000
Diso-octyl phthalate	11	35, 000	2-(12-(dimethylamino)ethoxy)ethanol/dimethylaminopropylene, opoxylated	15	366, 500
Disopropandamine	03	408, 000	Dimethylaminoethyl acrylate	15	367, 000
m-Disopropenylbenzene	03	777, 500	Dimethylaminoethyl acrylate, dimethyl sulfate	15	367, 800
Disopropyl adipate	11	63, 200	quaternary salt	15	367, 800
Disopropylamine	15	286, 000	Dimethylaminoethyl methacrylate, methyl chloride, quaternary salt	15	367, 900
2-Disopropylaminoethanol (N,N- diisopropylethanolamine)	15	362, 000	Dihydroxyethyl chloride	15	367, 950
2-Disopropylaminoethanol	15	363, 000	2,2-Dimethyl-N-(2-aminooethyl)-1,2-ethane diamine	13	272, 500
Disopropylamine	03	778, 000	Dimethylaminoethyl methacrylate, dimethyl sulfate, quaternary salt	15	368, 200
Disopropylbenzene	03	778, 100	quaternary salt	15	369, 000
Disopropylbenzene hydroperoxide	15	64, 000	2-Dimethylamino-2-methyl-1-propanol	15	369, 500
Disopropyl dimerate	15	966, 980	2-Dimethylamino-2-methyl-1-propanol hydrochloride	15	369, 600
Disopropyl hydrogen phosphate	14	272, 000	1-(Dimethylamino)-2-propanol	03	602, 000
Disopropyl ketone (2,4-Dimethyl-3-pentanone)	15	617, 000	1-(Dimethylamino)-2-propanol	15	374, 000
Disopropylphthalatesulfonic acid, sodium salt	12	166, 000	3-Dimethylaminopropylamine	15	259, 700
Disopropyl-4-phenoxylaniline	03	778, 200	Dimethylamino propylamine	15	379, 500
N,N-Diisopropyl-p-phenylenediamine	14	181, 000	11-[3(Dimethylamino)propyl]-6H-hydroxy[benz(b,e) oxepin]	03	803, 000
S-(O-Disopropyl phosphorodithioate) ester of N-(α - mercaptoethyl)benzenesulfonamide (Bensulfide)	13	56, 000	Dimethylammonium propyl methacrylate	15	236, 780
Disopropyl sebacate	11	114, 100	Dimethylammonium hydrogen isophthalate	09	41, 725
Disostearyl dimerate	15	966, 985	N,N-Dimethylamine	03	805, 000
Diketene	15	104, 620	2,6-Dimethylamine	03	805, 500
Dilauryl-3- β -thiodipronate	06	940, 000	N,N-Dimethylbenzylamine	12	432, 970
Dimethylacrylate	06	355, 650	N,N-Dimethylbenzylamine	12	439, 000
Dimethylamine	06	60, 000	1,1-Dimethyl-4,4'-bipyridinium dichloride	13	118, 049
Dimer acid (C ₃₆ aliphatic dibasic acid)	12	509, 000	2,1-Dimethylbutanol (isoneyl alcohol)	15	651, 700
Dimeracidalkyl amine	12	419, 300	N,N-Dimethylbutylamine	15	274, 995
N-(Dimercaptoalkyl)trimethylenediamine	06	94, 000	N-(1,3-Dimethylbutyl)-N-phenyl-p-phenylenediamine	09	59, 310
Dimethindene maleate	12	342, 250			
2,5-Dimethoxyaniline, ethoxylated	03	783, 000			
m-Dimethoxybenzaldehyde	03	784, 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	1185, 000			
1,1-Dimethoxy octane	07	129, 690			

Table D-1—Continued
Alphabetical chemical index

Chemical name	Secr. Item No.	Chemical name	Secr. Item No.
N,N-Dimethyl capramide	12	N,N-Dimethyl(9-octadecenyl-alkyl) amine	437-500
Dimethyl carbonate	15	N,N-Dimethyloctadecylamine	12
N,N-Dimethyl[coconut oil(alkyl)amine	941,000	N,N-Dimethyl(9-octadecenyl-alkyl) amine	437-500
N,N-Dimethyl[coconut oil(alkyl)amine oxide	12	N,N-Dimethyl(9-octadecenyl-alkyl) amine	437-500
N,N-Dimethyl[coconut oil(alkyl)amine oxide	12	N,N-Dimethyl(9-octadecenyl-alkyl) amine	437-500
N,N-Dimethyl[coconut oil(alkyl)amine oxide	12	N,N-Dimethyl(9-octadecenyl-alkyl) amine	437-500
Dimethyl-1,4-cyclohexane dicarboxylate	325,360	3,7-Dimethyl-2,6-octadienal (Citral A,geranial)	17
Dimethyl-1,4-cyclohexane dicarboxylate	81,500	3,7-Dimethyl-2,6-octadienal (Citral a&b)	07
Dimethyl-1,4-cyclohexane dicarboxylate	81,500	3,7-Dimethyl-2,6-octadienitrile	07
Dimethyl cyclohexane methanol	95,580	3,7-Dimethyl-cis-2,6-octadienyl-ol (Nerol)	07
β,4-Dimethyl-3-cyclohexene-1-propanol	30,501	3,7-Dimethyl-1,6-octadienyl-ol (Geraniol)	07
1,4-Dimethyl-3-cyclohexene-1-propanol	30,500	3,7-Dimethyl-1,6-octadien-3-ol (Linalool) (Linalyl alcohol)	07
N,N-Dimethylcyclohexylamine	07	3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	07
N,N-Dimethylcyclohexylamine	07	3,7-Dimethyl-1,6-octadien-3-ol, acetate (Linalyl acetate)	07
N,N-Dimethyldecylamine	03	3,7-Dimethyl-1,6-octadien-3-yl formate	07
N,N-Dimethyldecylamine [mixed straight and branched chains]	12	3,7-Dimethyl-1,6-octadien-3-yl isobutyrate (Linalyl isobutyrate)	07
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane	485,780	3,7-Dimethyl-2,6-octadienyl phenylacetate (Geranyl phenylacetate)	07
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane-3	1295,000	3,7-Dimethyl-1,6-octadien-3-yl propionate (Linalyl propionate)	07
O,O-Dimethyl-O-2,2-dichlorovinyl phosphate (DDVP)	1296,000	Dimethyloctanal	07
5,6-Dimethyl-2-dimethylamino-4-pyrimidinyl dimethyl carbamate	223,000	3,7-Dimethyl-3-octanol	07
Dimethyl(dioctadecyl)ammonium chloride	13	3,7-Dimethyl-3-octanol	07
4,4'-Dimethyldiphenyl ether	486,000	3,7-Dimethyl-6-octenyl-ol (Citronellal)	07
Dimethyldithiocarbamic acid, bismuth salt	138,000	3,7-Dimethyl-6-octenyl-ol (Citronellol)	07
Dimethyldithiocarbamic acid, copper salt	138,000	3,7-Dimethyl-7-octenyl-ol (Citronellol)	07
Dimethyldithiocarbamic acid, lead salt	140,000	Dimethylhydroxyethylene urea	14
Dimethyldithiocarbamic acid, potassium salt	171,000	O,O-Dimethyl S-[4-(oxo-1,2,3-benzotriazin-3(3H)-yl) methyl]phosphorodithioate (Acziphos-methyl)	15
Dimethyldithiocarbamic acid, potassium salt	141,000	N,N-Dimethyl-5,9,10-perylene-tetracarboxylic acid 3,4,9,10-dimide	03
Dimethyldithiocarbamic acid, selenium salt	09	α,α-Dimethylphenyl acetate	07
Dimethyldithiocarbamic acid, sodium salt	09	N,N-Dimethylphenyl urea	32,000
Dimethyldithiocarbamic acid, zinc salt	143,000	Dimethyl phosphate of 3-hydroxy-N-methyl-cis-crotonamide	15
N,N-Dimethyldodecylamine	12	O,S-Dimethyl phosphorodithioate	13
N,N-Dimethyldodecylamine	12	Dimethyl phosphorodithioate	13
N,N-Dimethyldodecylamine	12	Dimethyl phthalate	15
4-(1,1-Dimethyl(ethyl)cyclohexanol	433,420	Dimethyl piperazine	11
2,5-Dimethyl-2,5-di(2-ethylhexanoyl peroxy) hexane	327,910	3,5-Dimethylpiperidine	15
S-(((1,1-Dimethyl(ethyl)thio)imethyl) O,O-dialkylthio phosphorodithioate (Turbufoos)	12	1,1-Dimethylpiperidinium chloride	03
N,N-Dimethylformamide	223,500	N,N-Dimethyl-1,3-propanediamine polymer with epichlorohydrin, sulfate	13
N,N-Dimethylglycine	237,000	2,2-Dimethyl-1,3-propanediol (Neopenyl glycol)	14
2,6-Dimethylheptan-2-ol	5,000	Dimethylpropionic acid (Neopentanoic acid)	15
N,N-Dimethylhexadecylamine	6,000	Dimethyl sebacate	11
N,N-Dimethylhexadecylamine oxide	95,610	Dimethyl sulfide	02
N,N-Dimethylhexadecylamine oxide	435,000	Dimethyl sulfone	15
N,N-Dimethylhexadecylamine oxide	328,000	Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	12
Dimethyl hexanediol	07	N,N-Dimethyltetradecylamine	12
2,5-Dimethyl-3-hexene-2,5-diol	134,650		
N,N-Dimethylhydantoin	816,000		
N,N-Dimethyl(hydrogenated tallow alkyl)amine	1028,000		
Dimethyl hydrogen phosphate	12		
Dimethyl isophthalate	436,000		
Dimethyl isopropanolamine	11		
Dimethyl methoxyphosphonate	31,500		
O,O-Dimethyl O-[4-(methylthio)-m-tolyl]phosphorothioate (Fenthion)	1029,000		
N,N-Dimethyl(mixed alkyl)amine	13		
N,N-Dimethyl(mixed alkyl)amine oxide	12		
2,6-Dimethylnaphthalene	328,100		
Dimethyl-2,6-naphthalenedicarboxylate	03		
	819,750		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
N-(5-1,1-Dimethyl-1,3,4-thiadiazol-2-yl)-N,N-dimethylurea (Taubituron)	13	118,061
Dimethyltin dichloride	15	1404,200
N,N-Dimethyl-10-TG	15	1404,210
N,N-Dimethyl-p-toluidine	03	827,800
N,N-Dimethyl-p-toluidine	03	828,000
N-[2,4-Dimethyl-5-[[trifluoromethyl]sulfonyl]amino]phenyl]acetamide diethanolamine salt	13	168,375
1,1-Dimethyl-3-(α , α , α -trifluoro-m-tolyl)urea (Fluometuron)	13	118,040
Morpholine diethyl ether	15	68,279
N,N-Di-2-naphthyl-p-phenylenediamine	06	171,000
Dinitrobenzene	03	834,000
2,4-Dinitrobenzenesulfonic acid, sodium salt	03	835,100
Dinitrobutyric acid	03	836,000
Dinitrobutyric acid (DNBP)	13	63,000
3,5-Dinitrochlorobenzene	03	838,500
3,5-Dinitro-N-dipropyl cumidine	13	118,038
3,5-Dinitro-N,N-dipropylsulfanilamide	13	118,032
2,4-Dinitrophenol, tech	03	840,000
2,4-Dinitrophenoxymethanol	03	840,500
3,5-Dinitrosalicylic acid, methyl ester	03	842,200
Dinitrosobenzene	03	844,000
2,4-Dinitrotoluene	03	845,000
2,4-(and 2,6)-Dinitrotoluene	03	846,700
3,5-Dinitro-p-toluenesulfonic acid	12	743,000
Dionylphenol, ethoxylated	11	33,000
Dionylphenol, ethoxylated and phosphated	11	33,000
Dionyl phthalate	11	33,000
Dionyl undecyl phthalate	06	679,200
Dinoprostone	11	63,300
Di-n-octyl adipate	15	969,020
Diocetyl dimerate	12	487,150
N,N-Dioctyl-N,N-dimethyl ammonium chloride	15	71,200
Di-tert-octyl hydroquinone	15	947,000
Diocetyl maleate	11	36,000
Di-n-octyl phthalate	11	37,000
Diocetyl phthalates, all other	11	37,000
Dioleic acid (Ratio = 1/2)	12	555,100
Dioxane (1,4-Diethylene oxide)	15	72,000
2,4-Dioxo-3-azaspiro[5.5]undecane-1,5-dicarbonitrile monoonium salt	03	846,500
1,3-Dioxolane	15	73,000
Di-para-benzoquinone dioxime	03	847,100
Di-para-xylene	15	74,068
Di-N,N'-pentamethylenethuram tetrasulfide	09	42,000
Dipentylamine	15	295,000
2,4-Di-tert-pentylphenol	03	847,000
Diphenyldramine citrate	06	115,002
Diphenyldramine hydrochloride	06	95,000
Diprenoxylate	06	920,300
2-Diphenylacetyl-1,3-indandione and sodium salt	13	1,017,010
Diphenylamine	03	653,000
Diphenylamine-acetone aldehyde	09	52,700
Diphenylamine-acetone condensate	09	53,000
p-Diphenylaminodiazonium sulfate	14	350,000
Diphenyl-1-butythexyl phosphite	15	73,220
Diphenyldimethoxysilane	03	855,500
Diphenyl-4,4'-diphenylmethylenedicarbamate	09	124,350
Diphenyldisulfide	03	855,250
Diphenylisocetyl phosphite	15	73,340
Diphenylisocetyl phosphite	15	73,340
Diphenylmethane-4,4'-dilisocyanate (MDI)	03	1020,000
N,N'-Diphenyl-p-phenylenediamine	09	62,000
Diphenyl phosphorous chloride	03	858,500
Diphenyl phthalate	03	857,400
Diphenylsulfone sulfonic acid, potassium salt	12	210,700
Di-2-picolylamine	03	858,600
1,3-Di-4-phenylidylpropane	03	858,313
Di-n-propylaluminum chloride	11	4,000
Dipropylamine	15	1359,400
Dipropylene glycol	15	300,000
Dipropylene glycol monomethyl ether (3-(3-methoxypropoxy)propanol)	15	1187,280
Dipropylene glycol salicylate	15	174,300
Di-n-propylsociochromonate	13	148,500
Di-N-propylphosphordithioic acid	14	203,000
Direct Black 22	04	613,000
Direct Black 80	04	623,163
Direct Black 163	04	623,165
Direct Black 165	04	623,170
Direct Black 170	04	623,179
Direct Black 179	04	625,000
Direct Black dyes, all other	04	539,000
Direct Blue 15	04	542,000
Direct Blue 25	04	547,000
Direct Blue 75	04	548,000
Direct Blue 76	04	550,000
Direct Blue 80	04	552,000
Direct Blue 86	04	555,000
Direct Blue 98	04	556,000
Direct Blue 100	04	557,108
Direct Blue 108	04	564,000
Direct Blue 120, 120:1, 120:2, and 120:3	04	568,000
Direct Blue 160	04	568,000
Direct Blue 169	04	565,000
Direct Blue 191	04	567,000
Direct Blue 199	04	568,000
Direct Blue 216	04	569,261
Direct Blue 261	04	570,559
Direct Blue 259	04	570,549
Direct Blue 274	04	570,561
Direct Blue 283	04	570,582
Direct Blue 285	04	570,582
Direct Blue 286	04	570,586
Direct Blue 290	04	570,290

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
Direct blue dyes, all other	04	571,000	Direct Yellow 137	04	454,137
Direct Brown 44	04	597,000	Direct Yellow 147	04	454,147
Direct Brown 154	04	605,000	Direct Yellow 148	04	454,148
Direct Brown 230	04	606,230	Direct Yellow 154	04	454,154
Direct Brown 231	04	606,231	Direct Yellow 166	04	454,166
Direct Brown 232	04	606,232	Direct yellow dyes, all other	04	455,000
Direct Brown 238	04	606,238	N,N'-Disalicylidene-1,2-propanediamine	14	161,000
Direct brown dyes, all other	04	607,000	Sodium cyanodithiocarbamate	13	179,000
Direct Green 92	04	586,092	Disopyramide phosphate	08	378,500
Direct green dyes, all other	04	587,000	Disperse Black 1	04	749,000
Direct Orange 15	04	461,000	Disperse Black 9	04	751,000
Direct Orange 26	04	462,000	Disperse Black 33	04	752,000
Direct Orange 39	04	466,000	Disperse black dyes, all other	04	753,000
Direct Orange 72	04	470,000	Disperse Blue 3	04	716,000
Direct Orange 80	04	475,000	Disperse Blue 7	04	717,000
Direct Orange 112	04	479,019	Disperse Blue 14	04	718,014
Direct Orange 108	04	483,008	Disperse Blue 21	04	719,000
Direct orange dyes, all other	04	483,009	Disperse Blue 60	04	723,000
Direct Red 3	04	519,195	Disperse Blue 62	04	723,000
Direct Red 16	04	488,000	Disperse Blue 64	04	727,000
Direct Red 24	04	491,000	Disperse Blue 73	04	729,000
Direct Red 26	04	492,000	Disperse Blue 77	04	730,000
Direct Red 72	04	499,000	Disperse Blue 79	04	731,000
Direct Red 73	04	500,000	Disperse Blue 81	04	732,000
Direct Red 80	04	504,000	Disperse Blue 95	04	734,000
Direct Red 81	04	505,000	Disperse Blue 102	04	735,106
Direct Red 83	04	506,000	Disperse Blue 106	04	739,000
Direct Red 224	04	521,224	Disperse Blue 118	04	739,122
Direct Red 236	04	521,236	Disperse Blue 122	04	742,148
Direct Red 238	04	521,238	Disperse Blue 148	04	743,165
Direct Red 239	04	521,239	Disperse Blue 165	04	743,163
Direct Red 254	04	521,254	Disperse Blue 183	04	743,200
Direct red dyes, all other	04	522,000	Disperse Blue 200	04	743,281
Direct Violet 9	04	525,000	Disperse Blue 281	04	743,284
Direct Violet 66	04	531,000	Disperse Blue 284	04	743,284
Direct Violet 99	04	532,099	Disperse Blue 291	04	743,291
Direct Violet 195	04	532,104	Disperse Blue 317	04	743,317
Direct violet dyes, all other	04	533,000	Disperse Blue 333	04	743,333
Direct Yellow 4	04	421,000	Disperse Blue 357	04	743,337
Direct Yellow 5	04	421,000	Disperse Blue 359	04	743,359
Direct Yellow 6	04	427,000	Disperse blue dyes, all other	04	749,000
Direct Yellow 11	04	427,000	Disperse Brown 16	04	749,018
Direct Yellow 34	04	438,000	Disperse Brown 22	04	747,022
Direct Yellow 44	04	439,000	Disperse Brown 26	04	747,026
Direct Yellow 50	04	439,051	Disperse Brown 27	04	747,027
Direct Yellow 51	04	439,051	Disperse Green 9	04	745,009
Direct Yellow 105	04	445,000	Disperse Orange 3	04	653,000
Direct Yellow 106	04	446,000	Disperse Orange 5	04	654,000
Direct Yellow 107	04	447,000	Disperse Orange 25 and 25.1	04	658,000
Direct Yellow 116	04	450,000	Disperse Orange 29	04	659,000
Direct Yellow 119	04	451,000	Disperse Orange 30	04	660,000
Direct Yellow 127	04	453,000	Disperse Orange 37	04	661,000
Direct Yellow 131	04	454,000	Disperse Orange 41	04	662,000
Direct Yellow 132	04	454,132	Disperse Orange 44 and 44.1	04	663,000
Direct Yellow 133	04	454,133	Disperse Orange 73	04	667,073

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Disperse Orange 89	04 668.089	Disperse Yellow 64	04 639.064
Disperse Orange 94	04 668.094	Disperse Yellow 77	04 642.000
Disperse Orange 138	04 668.138	Disperse Yellow 86	04 644.000
Disperse Orange dyes, all other	04 669.000	Disperse Yellow 88	04 646.000
Disperse Orange 153	04 668.153	Disperse Yellow 108	04 650.108
Disperse Red 5	04 670.000	Disperse Yellow 114	04 650.114
Disperse Red 13	04 672.000	Disperse Yellow 126	04 651.126
Disperse Red 17	04 678.000	Disperse Yellow 198	04 651.198
Disperse Red 30	04 680.000	Disperse Yellow 219	04 651.219
Disperse Red 50	04 683.000	Disperse Yellow 238	04 651.238
Disperse Red 55	04 683.000	Disperse Yellow 239	04 651.239
Disperse Red 60	04 684.000	Disperse yellow dyes, all other	04 652.000
Disperse Red 65	04 687.000	Distearyldimethyl ammonium methosulfate	12 456.550
Disperse Red 73	04 687.000	Distearyl-3,3'-thiodipropionate	15 949.000
Disperse Red 74	04 688.074	Distearyl-3,3'-thiodipropionate	13 166.011
Disperse Red 88	04 691.000	N,N'-(Di-tall oil acid)amidoethylamine	06 832.000
Disperse Red 117	04 694.000	Di-tertiary nonylpoly sulfide	12 385.500
Disperse Red 135	04 689.135	Dithalwamidoammonium sulfate	14 487.500
Disperse Red 136	04 689.000	2,2',4'-Dithiobis(benzothiazole)	09 116.000
Disperse Red 137	04 689.000	2,2',4'-Dithiobis(benzothiazole)	09 116.000
Disperse Red 145	04 689.000	Dithiodibromamic acid	05 929.000
Disperse Red 153	04 689.153	Dithiodibromamic acid derivatives, acyclic, other	05 930.000
Disperse Red 159	04 700.000	4,4'-Dithiodic acophline	05 514.080
Disperse Red 167 and 167-1	04 700.167	Dithiodipropionic acid	03 43.000
Disperse Red 177	04 701.000	2,5-Di- <i>p</i> -toluidinoterephthalic acid	15 513.100
Disperse Red 179	04 702.000	Di-tridecyl adipate	03 865.100
Disperse Red 263	04 703.263	Di-tridecyl maleate	11 63.400
Disperse Red 273	04 703.273	Di-tridecyl phthalate	15 951.000
Disperse Red 274	04 703.274	Di(tridecyl)-3,3'-thiodipropionate	15 952.000
Disperse Red 276	04 703.276	Dlundecyl phthalate	11 39.300
Disperse Red 278	04 703.278	1,5-Diureidonaftthalene	03 865.800
Disperse Red 311	04 703.311	Divinylbenzene	03 866.000
Disperse Red 316	04 703.316	Divinyl tetramethyldisiloxane	15 1385.500
Disperse Red 325	04 703.325	Dobutamine	06 326.200
Disperse Red 333	04 703.333	1-Docosanol (Behenyl alcohol, C ₂₂)	15 852.300
Disperse Red 335	04 703.335	Docosanyl docosenoate	15 869.050
Disperse Red 338	04 703.338	Docosate, calcium	06 591.700
Disperse Red 339	04 703.339	Docusate, potassium	06 591.720
Disperse Red 340	04 703.340	Docusate, sodium	06 591.740
Disperse Red 345	04 703.345	n-Dodecane	15 1338.000
Disperse Red 358	04 704.000	Dodecanedioic acid	15 514.000
Disperse red dyes, all other	04 704.000	Dodecene	02 78.000
Disperse Violet 1	04 707.017	Dodecenylic-acetic succinimide	14 247.000
Disperse Violet 18	04 710.000	Dodecenylic succinic acid, benzotriazole salt	14 276.000
Disperse Violet 28	04 710.033	Dodecenylic succinic anhydride	15 165.600
Disperse Violet 33	04 710.033	Dodecyl alcohol (Lauryl alcohol)	15 872.000
Disperse Violet 36	04 710.036	Dodecyl alcohol, ethoxylated	12 729.000
Disperse Violet 48	04 713.048	Dodecyl alcohol, ethoxylated and phosphated	12 77.000
Disperse Violet 60	04 713.060	Dodecyl alcohol, ethoxylated and phosphated, ammonium salt	12 78.000
Disperse Violet 91	04 713.091	Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	12 271.000
Disperse violet dyes, all other	04 698.000	Dodecyl alcohol, ethoxylated and sulfated, sodium salt	12 420.000
Disperse Yellow 3	04 631.000	Dodecylamine	03 870.000
Disperse Yellow 23	04 636.000	Dodecylbenzene, other	03 870.000
Disperse Yellow 42	04 636.000	Dodecylbenzene, straight-chain	03 869.000
Disperse Yellow 54	04 638.000		

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Chemical name	Sect. Item No., No.	Chemical name	Sect. Item No., No.
Dodecylbenzene sulfonates, all other	12	Dodecyltrimethylammonium bromide	12
Dodecylbenzenesulfonic acid	114, 000	Dodecyltrimethylammonium chloride	488, 000
Dodecylbenzenesulfonic acid, (Mixed alkyl)amine salt	128, 000	Doxapram hydrochloride	06 550, 001
Dodecylbenzenesulfonic acid, ammonium salt	122, 000	Doxazosin mesylate	06 355, 725
Dodecylbenzenesulfonic acid, calcium salt	115, 000	Doxepin	06 426, 800
Dodecylbenzenesulfonic acid, diethanolamine salt	117, 000	Doxepin hydrochloride	06 527, 000
Dodecylbenzene sulfonic acid, DMAP salt	118, 000	Doxyamine succinate	06 96, 000
Dodecylbenzenesulfonic acid, ethylenediamine salt	119, 500	Drug and Cosmetic Green 5	04 793, 000
Dodecylbenzenesulfonic acid, isopropanolamine salt	120, 000	Drug and Cosmetic Green 8	04 798, 000
Dodecylbenzenesulfonic acid, isopropylamine salt	121, 000	Drug and Cosmetic Orange 5	04 796, 000
Dodecylbenzenesulfonic acid, monoethanolamine salt	122, 500	Drug and Cosmetic Red 6	04 800, 000
Dodecylbenzenesulfonic acid, oleyl amine, ethoxylated, salt	122, 700	Drug and Cosmetic Red 7	04 801, 000
Dodecylbenzenesulfonic acid, potassium salt	123, 000	Drug and Cosmetic Red 17	04 807, 000
Dodecylbenzenesulfonic acid, sodium salt	125, 000	Drug and Cosmetic Red 21	04 809, 000
Dodecylbenzenesulfonic acid, triethanolamine salt	127, 000	Drug and Cosmetic Red 27	04 811, 000
N-Dodecylidienetriamine	12	Drug and Cosmetic Red 30	04 813, 000
Dodecylidiphenyl oxide	03 408, 000	Drug and Cosmetic Red 33	04 815, 000
Dodecylphenyloxidodisulfonic acid	12 870, 800	Drug and Cosmetic Red 34	04 816, 000
Dodecylphenyloxidodisulfonic acid, disodium salt	12 203, 990	Drug and Cosmetic Yellow 5	04 820, 000
Dodecyl disodium benzaine, N-(2-carboxylethyl), sodium salt	12 206, 000	Drug and Cosmetic Yellow 10	04 823, 000
n-Dodecylamine acetate (Dodine)	12 10, 420	Eopronium chloride	06 575, 700
N-Dodecyl-3-iminodipropionic acid	12 198, 000	Etrofornicin	06 65, 500
N-Dodecyl-3-iminodipropionic acid, disodium salt	12 10, 500	Enalapril maleate	06 360, 100
tert-Dodecyl mercaptan, ethoxylated	12 11, 020	Enturane	06 436, 500
n-Dodecyl mercaptane	09 171, 000	Epichlorohydrin	15 1310, 000
Dodecylnitrobenzene	03 872, 000	Epichlorohydrin bisphenol A, ethoxylated	12 744, 500
4-(Dodecyloxy)-2-hydroxybenzophenone	15 75, 000	Epichlorohydrin elastomers (CO ₂ ECO) type	10 1, 000
Dodecylphenol	12 40, 400	Epoxydes, ethers, acetals, all other	11 80, 000
Dodecylphenyl ether	15 952, 700	Epoxydes esters, all other	11 75, 400
Dodecylphenyl ether, ethoxylated	12 744, 000	Epoxydized linseed oils	11 76, 600
Dodecylphenol, ethoxylated and phosphorylated	12 873, 000	Epoxydized pentaerythritol tetraphthalate	08 6, 000
Dodecylphenol, sulfurized, calcium salt	14 228, 000	Epoxydized soyabean oil	11 76, 000
Dodecylphenyl- α -naphthylamine	14 277, 000	Epoxy resin amorphified	08 6, 000
Dodecylphenyl- α -naphthylamine, dioctyl diphenylamine copolymer	14 278, 000	Epoxy resin amorphified (vitamin D ₂)	08 6, 000
Dodecylpyridinium chloride	15 74, 460	Erasamide	12 238, 000
1-Dodecylpyridinium chloride	12 526, 000	Ercucyl alkylamine	15 238, 000
Dodecyl succinic anhydride	14 204, 000	Ercucyl stearamide	15 238, 000
Dodecylsuccinic anhydride	15 165, 620	Erythronych	06 48, 000
Dodecyl succinic lactate	15 921, 800	Erythronych estolate	06 46, 500
Dodecyl sulfate, ammonium salt	12 223, 000	Erythronych stearate	06 46, 800
Dodecyl sulfate, diethanolamine salt	12 223, 000	Erythronych succinate	06 46, 800
Dodecyl sulfate, N,N-diethylcyclohexylamine salt	12 223, 000	Erythronych thioacetate	08 46, 800
Dodecyl sulfate, isopropanolamine salt	12 224, 000	Esters of sulfated oleic acid, all other	12 263, 000
Dodecyl sulfate, magnesium salt	12 225, 000	Ester lin mercaptoesters	15 1404, 500
Dodecyl sulfate, potassium salt	12 226, 000	Estradiol cypionate	06 674, 500
Dodecyl sulfate, sodium salt	12 227, 000	Estrogens, all other	06 679, 000
Dodecyl sulfate, triethanolamine salt	12 228, 000	Estrogens, conjugated	06 675, 000
Dodecyl sulfoacetate, sodium salt	12 199, 100	Ethanolamine condensates, all other	12 568, 000
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, ammonium salt	12 273, 000	Ethanolamine condensates, amine/acid ratio = 1/1, all other	12 566, 000
		Ethanolidiglycine, disodium salt	14 43, 000
		4-Ethanolpiperidine	03 873, 550
		2-Ethanolpyridine	03 873, 600

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
5-Ethoxy-3-trichloromethyl-1,2,4-thiadiazole	03 873.700	1-Ethoxy-3-methylbenzene	03 877.700
Ethchlorval	06 468.000	2-Ethoxy-2-methyl-N-phenylaniline	03 877.900
Ethers and thioethers, all other	12 775.000	3-Ethoxynaphthalene	07 35.000
Ethisterone	03 873.800	3-Ethoxypropionitrile	15 440.000
Ethopabate	06 172.000	Ethyl acetate	07 143.950
Ethosuximide	06 419.000	Ethyl acetate (100% basis)	15 954.001
Ethothol	08 420.000	Ethyl acetoacetate	15 955.000
N- <i>l</i> p-ethoxycarbonyl(phenyl)- <i>n</i> -ethyl- <i>n</i> -phenylformamide	07 34.200	Ethyl acrylate	15 956.000
6-Ethoxy-12-dihydro-2,4-trimethyl quinoline	15 76.500	Ethyl acrylate methacrylic acid copolymer	14 419.000
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	15 1159.000	Ethyl alcohol, phosphated, amine salt	12 96.700
2-[2-Ethoxyethoxy]ethanol (Diethylene glycol monoethyl ether)	15 1160.000	Ethyl alcohol, synthetic	12 853.000
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	15 1161.000	Ethylaluminum dichloride	15 1360.000
2-[2-(2-Ethoxyethoxy)ethyl] acetate	15 1105.000	Ethylaluminum sesquichloride	15 1361.000
Ethoxyethyl acetate	15 993.000	Ethylamine, mono-	15 278.000
Ethoxylated acetic acid, sodium salt	12 318.100	2-Ethylaminoethanol (Ethylmonoethanolamine)	15 385.000
Ethoxylated anhydrosorbitol esters, all other	12 624.000	2-(Ethylamino)-4-(isopropylamino)-6-(methylthio)-s-triazine (Armetyne)	13 69.000
Ethoxylated anhydrosorbitol monolaurate	12 616.000	o-Ethylaniline	03 882.500
Ethoxylated anhydrosorbitol mono-oleate	12 617.000	N-Ethylaniline, refined	03 883.000
Ethoxylated anhydrosorbitol monopalmitate	12 618.000	2-(<i>N</i> -Ethylanilino)ethanol	03 884.000
Ethoxylated anhydrosorbitol monostearate	12 619.000	3-(<i>N</i> -Ethylanilino)propionitrile	03 886.000
Ethoxylated anhydrosorbitol triester of tall oil acids	12 620.000	o-(<i>N</i> -Ethylanilino)- <i>m</i> -toluenesulfonic acid	03 887.000
Ethoxylated anhydrosorbitol trioleate	12 621.000	Ethyl anthranilate	07 35.800
Ethoxylated anhydrosorbitol tristearate	12 622.000	5-Ethyl-1-aza-3,7-dioxabicyclo[3.3.0]octane	15 76.900
Ethoxylated 1,3-butylene glycol condensed with oil fatty acid	12 707.820	Ethylbenzene	03 892.000
Ethoxylated 1,3-butylene glycol condensed with oil fatty acid	12 707.900	(Ethylbenzyl)dimethyl(mixed alkyl)ammonium chloride sulfate	12 527.000
Ethoxylated glycerol, dihydroxyolene glycol stearate	12 707.900	N-Ethyl-N,N-bis(polyoxyethylene)tallow ammonium ethyl sulfate	12 458.850
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	12 708.800	Ethyl butyrate	07 144.000
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	12 708.800	Ethyl caprate	07 144.100
Ethoxylated hydantoin glycol dicocotate	12 708.780	Ethyl cellulose	08 21.030
Ethoxylated hydrogenated tallow amine), methyl ammonium chloride	14 162.000	Ethyl chloride (Chloroethane)	15 1223.000
Ethoxylated 1,2-propanediol monostearate	12 458.100	Ethyl chloroformate	15 959.000
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	12 711.000	Ethyl 2-(4-chloro-6-methoxypropimidin-2-yl) amino carbonyl amino sulfonyl benzoate (Chlorimuron ethyl)	13 69.025
Ethoxylated, quaternized(C ₁₂₋₁₈ alkyl) oxypropyl trimethylene diamine	12 708.700	Ethyl chloroformate	15 959.600
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	12 458.200	Ethyl cinnamate	07 36.000
Ethoxylated sorbitol beeswax ester	12 625.200	Ethyl cyanoacetate	15 440.100
Ethoxylated sorbitol hexaester of tall oil acids	12 627.000	Ethyl 2-cyano-3-diphenyl acrylate	15 77.800
Ethoxylated sorbitol hexaoleate	12 628.000	2-(<i>N</i> -Ethyl-N, β -cyanoethyl)-4-acetaminoisole	03 895.100
Ethoxylated sorbitol lanolin ester	12 629.000	Ethyl cyclohexylamine)thiocarbamate	15 78.100
Ethoxylated sorbitol mono-oleate	12 630.000	Ethyl 3-(<i>n</i> -butylmethyl)thiocarbamate	13 69.100
Ethoxylated sorbitol monostearate	12 631.000	O-ethyl S-(di- <i>n</i> -butyl) phosphorodithioate	15 1296.320
Ethoxylated sorbitol oleate, acetylated	12 631.500	S-Ethyl disubutylthiocarbamate (Butylate)	13 166.053
Ethoxylated sorbitol pentaoleate	12 633.000	Ethyl(dimethyl(mixed alkyl)ammonium ethyl sulfate	12 400.000
Ethoxylated sorbitol tetraester of lauric and oleic acids	12 635.000	O-Ethyl S,S-dipropyl phosphorodithioate	13 243.010
Ethoxylated sorbitol tetraester of tall oil acids	12 636.000	S-Ethyl dipropylthiocarbamate (EPTC)	13 202.000
Ethoxylated sorbitol tetraoleate	12 636.400	Ethylene-acrylic acid resins (EAA)	08 31.900
Ethoxylated sorbitol tetraesterate	12 636.500	N,N-Ethylenebisococamide	15 239.900
Ethoxylated sorbitol tetraesterate	12 636.500	Ethylene bis (dithiocarbamic acid), disodium salt (Nabam)	13 183.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Ethylene bis(dithiocarbamic acid), manganese salt with zinc ions	13	1-Ethyl-2-(8-hepta-decyl)-1-(2-hydroxyethyl)-2-imidazolium ethyl sulfate	12
Ethylene bis(dithiocarbamic acid), zinc and manganese salts	13	N-Ethyl-N-hexadecylmorpholinium ethyl sulfate	07
N,N'-Ethylenebis-oleamide (Oleic acid-ethylene diamine)	240,000	S-Ethyl-hexahydro-1H-azepine-1-carboxylate (Molinate)	13
N,N'-Ethylenebis-terephthalamide (ratio = 1/2)	241,000	2-Ethylhexanal (α -Ethylcaproaldehyde)	15
Ethylene bis tetrabrom	1213,200	2-Ethyl-1,3-hexanediol	15
Ethylene carbonate	1105,700	Ethyl hexanoate	07
Ethylenechlorotrifluoro ethylene copolymer (Halar)	38,230	2-Ethylhexanoic acid (α -Ethylcaproic acid)	15
Ethylenediamine	280,000	2-Ethylhexanoic acid salts, all other	15
Ethylenediamine, alkoxylated	328,450	2-Ethyl-1-hexanol	15
Ethylenediamine dihydroiodide	583,000	2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated	12
Ethylene diamine ethoxylated	182,455	2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated, sodium salt	12
Ethylene dibromide	12	2-Ethylhexanol, ethoxylated and phosphated	12
(Ethylene-dinitrilo)tetraacetic acid	14	2-Ethylhexanol, ethoxylated, phosphated, potassium salt	12
(Ethylene-diamine)tetraacetic acid (EDTA)	47,000	2-Ethylhexanoyl chloride	15
(Ethylene-dinitrilo)tetraacetic acid, calcium disodium salt	14	2-Ethyl-1-hexyl acetate	15
(Ethylene-dinitrilo)tetraacetic acid, diammonium salt	14	2-Ethyl-1-hexyl acrylate	15
(Ethylene-dinitrilo)tetraacetic acid, disodium copper salt, dihydrate	54,000	2-Ethylhexyl acrylate-methyl acrylate copolymer resins	08
(Ethylene-dinitrilo)tetraacetic acid, disodium salt, dihydrate	14	2-Ethylhexyl amines, mono-	15
(Ethylene-dinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	58,000	1-Ethyl-2-hydroxybenzoate	13
(Ethylene-dinitrilo)tetraacetic acid, magnesium salt	14	N-(2-Ethylhexyl)picoloyl(2,2,1)-5-heptene-2,3-dithiolamide	15
(Ethylene-dinitrilo)tetraacetic acid, manganese salt	14	2-Ethylhexyl chloride	15
(Ethylene-dinitrilo)tetraacetic acid, monodiammonium ferric salt	14	2-Ethylhexyl chloroformate	15
(Ethylene-dinitrilo)tetraacetic acid, monosodium iron salt	59,000	2-Ethylhexyl-2-cyano-3,3-diphenyl acrylate	15
(Ethylene-dinitrilo)tetraacetic acid, tetraammonium salt	60,000	2-Ethylhexyl cyclohexyl phthalate	11
(Ethylene-dinitrilo)tetraacetic acid, tetrapotassium salt	61,000	2-Ethylhexyl-1-p-dimethylaminobenzoate	15
(Ethylene-dinitrilo)tetraacetic acid, tetrasodium salt	62,000	2-Ethylhexyl epoxyltalates	11
(Ethylene-dinitrilo)tetraacetic acid, trisodium salt	63,000	2-Ethylhexyl iodide (iodoethyl hexane)	15
1,1-Ethylenedurea	64,000	2-Ethyl-1-hexyl methacrylate	15
Ethylene glycol	388,200	2-Ethylhexyl-p-methoxy cinnamate	07
Ethylene glycol adipate	1081,000	2-Ethylhexyl-p-methoxy cinnamate	15
Ethylene glycol diacetate	63,450	2-Ethylhexyl nitrate ethyl ester	15
Ethylene glycol dimercaptoacetate	1106,000	2-Ethylhexyl oleate	11
Ethylene glycol dimethacrylate	1107,000	2-Ethylhexyl palmitate	11
Ethylene glycol distearate	638,000	2-Ethylhexyl phosphate	12
Ethylene glycol di-tert-butyl ether	1161,700	2-Ethylhexyl phosphate, potassium salt	12
Ethylene glycol di-tri-ethyl ether	1161,700	2-Ethylhexyl phosphate, sodium salt	12
Ethylene glycol di-tri-propyl ether	1187,320	2-Ethylhexyl polyphosphate, sodium salt	12
Ethylene glycol esters, all other	642,000	2-Ethyl hexyl salicylate	07
Ethylene glycol monoacetate	640,000	2-Ethylhexyl stearate	15
Ethylene glycol sesquistearate	641,000	2-Ethylhexyl stearate	11
Ethylene oxide	132,000	2-Ethylhexyl sulfate, sodium salt	12
Ethylene-propylene copolymer	278,000	p-[Ethyl(2-hydroxyethyl)amino]benzenediazonium chloride	14
Ethylene-propylene (EP) type	10,000	(N-Ethyl-N-[2-hydroxyethyl]-3-methyldehydrogen sulfate)	14
Ethylene-vinyl acetate (EVA) copolymer resins	31,700	p-phenylenediamine	14
Ethyl- α , β -epoxy- β -methylhydrochinamate	17	N-Ethyl-N-hydroxyethyl-1,4-pentanediamine	15
Ethyl ether	15	Ethyl hydroxymethyl oleyl oxazoline	15
Ethyl ethers of tetra and higher ethylene glycols (high boiling)	1313,000	2-Ethyl-2-(hydroxymethyl)-1,3-propanediol [Trimethylolpropane]	15
Ethyl formate	1161,400		
Ethyl furate	144,500		
	07		
	95,700		
	1083,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
2,2'-Ethyldiene-bis[4,6-di-tert-butylphenol] (Isonox 129)	15	Fatty acid residues	1434, 300
Ethylidene norbornene	15	Fatty acids	52, 200
Ethyl isobutyrate	07	Fatty acids, hydrogenated	15
(+)-5-Ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolyl)-2-ylcolic acid	13	Fatty acids, partially hydrogenated	15
Ethyl isovalerate	07	Fatty amines	282, 000
Ethyl laurate	07	Fenchol	95, 790
Ethyl maleate, mono	13	Enopropylate	06
N-Ethylmaleimide	03	Ethanol	401, 200
Ethyl mercaptan (Ethanethiol)	05	Ethyl C ₁₂ methacrylate	06
Ethyl methacrylate	15	Ethyl C ₁₂ methacrylate, lead salts	15
N-Ethyl-2-methylallylamine	05	Ethylacrylate	646, 700
6-Ethyl-2-methylbutane	15	Ethylacetate	745, 500
Ethyl-2-methylbutyrate	07	Ethylalcohol	172, 500
Ethyl-2-methylpentanoate	07	Etiation reagents, all other	14
2-[Ethyl(3-methylphenyl)amino]ethanol	03	Fluocanazole	14, 700
N-[3-(1-Ethyl-1-methylpropyl)-5-isoxazolyl]-2,6-O-methoxybenzamide (Fleider) S-propyl	13	Fluocortisone acetate	06
7-Ethyl-2-ethylthiote	07	Fluorocortisone acetate	06
2-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	12	Fluorinated (including other fluorinated)	04
4-Ethylmorpholine	15	Fluorocarbons, all other	15
Ethyl myristate	07	p-Fluorocarbonyl chloride	03
2-Ethyl-2-nitro-1,3-propanediol	15	Fluorocarbonols, all other	03
Ethyl 2(2-nitro-4-trifluoromethylphenyl)-3-oxobutanoate	03	Fluorocarbonols, all other	08
Ethyl octanoate	07	5-Fluoro-2-methyl-1-[(4-methylsulfinyl)phenyl]methyleneth-indene	06
o-Ethylphenol	15	p-Fluoronitrobenzene	03
Ethyl phenylacetate	07	Fluorosterebene	06
N-Ethyl-N-phenylbenzylamine	03	Fluorotriazene hydrochloride	06
Ethyl(polyoxyethylene, cocoamine) ethylsulfate	12	Food, Drug, and Cosmetic Blue 1	04
Ethyl propionate	07	Food, Drug, and Cosmetic Blue 2	04
N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzamine	13	Food, Drug, and Cosmetic Green 3	04
5-Ethyl-2,3-pyridinedicarboxylic acid	03	Food, Drug, and Cosmetic Red 3	04
N-Ethyl pyrrolidone	15	Food, Drug, and Cosmetic Red 4	04
Ethyl salicylate	07	Food, Drug, and Cosmetic Red 40	04
Ethyl silicate	15	Food, Drug, and Cosmetic Yellow 5	04
N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	12	Food, Drug, and Cosmetic Yellow 6	04
Ethyl succinyl chloride	15	Formaldehyde (37% HCHO by weight)	15
Ethyl sulfate (Diethyl sulfate)	15	Formaldehyde, dicyandiamide, ethylene sulfate polymers	12
Ethylthioethanol	11		
N-Ethyl-p-toluenesulfonamide	03		
3-(N-Ethyl-m-toluidino)propionitrile	07		
Ethyl trimethyl cyclopentyl butanol	13		
Ethyl 3,7,11-trimethyltrideca-2,4-dienoate	07		
Ethyl valerate	15		
Ethyl vinyl ether	06		
Etidronate, disodium	08		
Expandable polystyrene beads	04		
External Drug and Cosmetic Orange 3	06		
Emulsiolene	15		
Fats and oils, chemically modified, all other	15		
Fatty acid alkylamine ester	15		
Fatty acid esters, not included with plasticizers	15		
surface-active agents, all other	15		
Fatty acid polyamine condensate	14		

Table D-1--Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
Formaldehyde polymer with carbamate esters	14	487,000
Formaldehyde polymer with ethylenediamine and nonyl phenol derivatives	14	163,000
Formic acid, 90%	15	524,000
1-Formylpiperidine	03	919,153
Fuel additives, acyclic, all other	14	177,000
Fumaric acid	15	525,000
2-Furaldehyde (Furfural)	15	82,000
Furan derivatives, all other	03	920,000
Furfuryl alcohol	15	84,000
Furfuryl alcohol, ethoxylated	03	921,000
Furfuryl amine	12	741,200
Furfuryl type resins	05	87,000
Furic acid	05	82,400
1-(2-Furyl)pyperazine	03	920,200
D-Galactose	03	920,000
D-Galactoside (1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethyl-cyclopenta-1'-2-benzopyran)	17	456,000
Gallium nitrate	08	98,000
Gasoline additives, acyclic, all other	14	278,400
Gasoline additives, cyclic, all other	14	169,000
Gasoline additives, cyclic, all other	14	190,000
Gentamycin	08	620,500
Geranyl acetate	06	48,000
Geranyl butyrate	07	151,000
Geranyl crotonate	07	153,001
Geranyl ethyl ether	07	153,007
Geranyl formate	07	153,010
Geranyl isobutyrate	07	153,020
Geranyl isovalerate	07	153,560
Geranyl nitrile (Citralva)	07	153,600
Geranyl propionate	07	158,800
Geranyl tiglate	13	166,450
Gibberellin acid	06	688,000
Glipizide	06	693,000
Glucagon	14	36,000
Glucosaminylase	14	65,000
Glucosheptic acid, β -isomer, sodium salt	14	66,000
Glucosheptic acid, sodium salt	14	66,000
α -Glucosamidopropyl dimethyl-2-hydroxyethyl ammonium chloride	12	471,500
Gluconic acid, potassium and sodium salts W/20% mix of sodium bisulfite-formaldehyde	12	57,530
Gluconic acid and salts, mixed	15	1494,800
Gluconic acid, technical	15	526,000
Glucose oxidase	14	123,000
Glucose oxidase	14	123,000
Glucose-6-phosphate dehydrogenase	04	8,000
Glutaric acid hydrochloride	08	578,500
Glutaric acid hydrochloride (liver function test)	15	792,000
Glutaraldehyde	11	85,950
Glutaric acid esters, all other	11	85,950
Glutathione	08	471,000
Glucosides, mixed C ₁₄ and C ₁₆ 's, mono-	15	1110,400
Glucosides, mono-	15	1110,400
Glycerine, alkoxylated	12	761,700
Glycerol, alkoxylated, toluene disocyanate copolymer	12	761,800
Glycerol diacetyltartrate monostearate	12	644,000
Glycerol diurea	12	651,500
Glycerol esters of chemically defined acids, all other	12	659,000
Glycerol esters of mixed acids, all other	12	659,000
Glycerol, ethoxylated	12	729,700
Glycerol, ethoxylated and phosphated	12	111,900
Glycerol monoallyl ether	15	1187,210
Glycerol mono-, di-, and triesters of hydrogenated tallow acids	12	648,800
Glycerol monoester of C ₉ -C ₁₆ acids	12	667,000
Glycerol monoester of coconut oil acids	12	660,900
Glycerol monoester of coconut oil acids, sulfated	12	661,000
Sodium salt	12	662,000
Glycerol monoester of cottonseed oil acids	12	662,000
Glycerol monoester of hydrogenated cottonseed oil acids	12	663,000
Glycerol monoester of hydrogenated lard acids	12	663,000
Glycerol monoester of hydrogenated soybean oil acids	12	664,000
Glycerol monoester of lard acids	12	665,000
Glycerol monoester of mixed fatty acids, acetylated	12	649,000
Glycerol monoester of mixed fatty acids, phosphated	12	112,000
Glycerol monoester of mixed fatty acids, succinylated	12	649,100
Glycerol monoester of palm oil acids	12	665,800
Glycerol monoester of safflower oil acids	12	666,200
Glycerol monoester of tall oil acids	12	666,300
Glycerol monoester of tallow acids	12	665,400
Glycerol monoaurate	12	655,000
Glycerol mono-oleate	12	657,000
Glycerol monolinoleate	12	657,000
Glycerol monostearate	12	658,400
Glycerol monooleate	12	658,400
Glycerol sesquilester of hydrogenated tallow acids	12	1084,000
Glycerol, synthetic only	15	667,900
Glycerol triester of mixed fatty acids	12	684,000
Glycerol triacetate/decanoate	12	658,400
Glycerol p-aminobenzoate	15	86,000
Glycerol diacetate (Diacetin)	15	111,000
Glycerol monoacetate (Monoacetin)	15	112,000
Glycerol monochloride	15	111,000
Glycerol mononitroacetate	15	113,000
Glycerol trifluoroacetate	15	109,000
Glycerol trifluoromethylacetate	15	109,000
Glycerol trifluoromethylacetate	15	109,000
Glycerol trifluoroacetate	15	120,000
Glycerol trioleate (Triolein)	11	83,000
Glycerol tripropionate	11	83,000
Glycerol triacetate	15	1115,500
Glycidol (2,3-Epoxy-1-propanol)	15	1317,000
α -Glycidoxypropyltrimethoxysilane	15	1387,000
Glycidyl isocyanate	15	1317,200
Glycine (Aminoacetic acid), non-medical	14	10,000
Glycolic acid (Hydroxyacetic acid)	15	528,000
Glycolic acid, potassium salt	15	663,750
Glycolic acid, sodium salt	15	664,000
Glycol palargonate	15	84,000
Glycol phthalate esters, all others	11	41,700

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Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
Glycol residues	15	1435-000	Hexadecyltrimethylammonium chloride	12	495,000
Glycopyrrolate	06	288,500	Hexadodecyl alcohol	15	874,000
Glyoxal	15	793,000	Hexafluoropropylene, monomer	15	1267,000
Glyoxal-formaldehyde resins	08	7,500	Hexaglycerol	12	691,947
Gonadotropin, acetate	06	682,900	Hexahydro-5-methoxy-4,7-methano-1H-indene	07	40,300
Grease, other than wool, sulfated, sodium salt	12	282,000	Hexahydro-1,3,5-triethyl-s-triazine	13	40,012
Guaiacwood acetate	07	96,100	Hexahydro-1,3,5-tris(2-hydroxyethyl)-s-triazine	13	40,022
Guaiene	07	96,200	Hexamethylsilazane	15	387,500
Guaifenesin	06	584,000	Hexamethylenediamine adipate (nylon salt)	15	397,000
Guanidine hydrochloride	13	398,000	Hexamethylenediaminetetra(methylene phosphonic acid), potassium salt	14	68,000
Guanidines, cyclic, other	09	52,600	Hexamethylenimine	03	92,670
Halazepam	06	500,600	Hexamethylenetetramine, tech.	05	166,310
Halichonide	06	639,500	N-Hexanal	07	153,910
Half-phthalic acid ester of tallow	12	318,300	Hexane	02	63,000
alkanolamide/monoglyceride	06	500,800	1,6-Hexanediamine (Hexamethylenediamine)	15	283,000
Haloferidol	07	80,500	1,5-Hexanediol	15	1083,000
Helloropyl acetate	07	80,520	2-Hexanol	02	155,300
Helloropyl acetone	07	80,500	2-Hexanone	02	67,015
Heptachloro-tetrahydro-endo-methanindene	13	136,000	n-Hexene	02	67,020
Heptachloro-ethyl-4,4-bis(hydroxymethyl)-2-oxazoline	12	343,000	Heptenes, mixed	07	155,400
2-(8-Heptadecyl)-4,4-bis(hydroxymethyl)-2-oxazoline	12	345,950	2-Heptanol	02	155,650
2-Heptadecyl-2-imidazole	12	410,000	Cis-3-Hexan-1-yl acetate	07	155,653
Heptadecylmethylbenzimidazolesulfonic acid, sodium salt	12	26,000	Cis-3-Hexenyl methyl carbonate	07	155,654
Heptaldehyde-aniline condensate	09	6,000	Cis-3-Hexenyl tiglate	07	40,500
n-Heptane	02	71,000	Cis-3-Hexenyl valerate	07	155,656
Heptanoic acid	15	528,500	Hexoacetalddehyde dimethyl acetal	07	155,700
Heptanoic acid, potassium salt	12	519,000	Hexyl acrylate	15	984,000
2-Heptanone (Methyl amyl ketone)	15	819,000	Hexyl acetate	15	985,000
3-Heptanone (Ethyl butyl ketone)	15	820,000	n-Hexyl alcohol	15	857,000
Heptenes, mixed	02	72,000	n-Hexylamine	15	284,000
n-Heptyl alcohol	15	856,000	Hexylamine ethoxylate	15	398,000
2-Heptylcyclopentanone	07	96,500	Hexyl (isononyl amide) carboxylic acid, mono-triethanolamine salts	12	57,560
Heptyl formate	07	185,010	0-Hexylchlamaldehyde	07	41,000
Herring oil, sulfated	12	289,490	2-Hexyl-2-cyclopenten-1-one	07	96,800
Herring oil, sulfated, sodium salt	12	299,000	Hexyl n-decyl phthalate	11	44,000
Hetacillin, potassium	06	87,820	Hexyl (isononyl amide) carboxylic acid, triethanol-diol ethanolamine, mixed salts	12	57,565
Hexachlorocyclohexane	03	94,000	Hexyl nitrate	07	155,715
Hexachlorocyclopentadiene	03	995,100	2-[2-(Hexyloxy)ethoxy]ethanol	14	149,000
1,4,5,6,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendic anhydride)	03	1342,000	Hexyloxypropyl amine	15	1164,000
Hexadecane	15	873,000	Hexyl phosphate, potassium salt	12	328,600
1-Hexadecanol (Cetyl alcohol)	15	96,600	Hexyl sulfate, potassium salt	12	99,900
Hexadecanolide	07	155,020	Hexyl sulfite, potassium salt	12	231,000
Hexadecyl acetate	07	730,000	Hexyl trichlorosilane	15	1387,530
Hexadecyl alcohol, ethoxylated	12	421,000	Homomenthol salicylate	15	88,999
Hexadecylamine	12	99,500	Humatrope	06	693,500
Hexadecyldiphosphate	12	347,000	Hydralazine hydrochloride	06	357,000
Hexadecylphosphoric acid	12	99,520	Hydratropaldehyde dimethyl acetal	07	43,000
N-Hexadecylmorpholine	15	441,750	Hydrazine acetate	15	594,500
Hexadecylnitrite	11	121,310	Hydrindantin	15	91,000
Hexadecyl stearate	15	121,310	Hydrocarbon carboxylic acid derivatives (specify)	14	205,000
Hexadecyl sulfate, sodium salt	12	230,000			
Hexadecylsulfonol chloride	15	1317,950			
Hexadecyltrimethylammonium bromide	12	494,000			

Table D-1.—Continued
Alphabetical Chemical Index

Chemical name	Sect. Item No.	Item No.
Hydrocarbon derivatives: all other hydrocarbon derivatives	02	156,000
Hydrocarbon phosphorus acid, barium salt	14	206,000
Hydrocarbon phosphoryl derivatives	14	207,000
Hydrocarbons, all other	15	1349,000
Hydrocarbons, C ₈ , all other	02	52,000
Hydrocarbons, C ₉ , all other	02	59,000
Hydrocarbons, C ₁₀ , all other	02	68,000
Hydrocarbons, C ₁₁ , all other	02	73,000
Hydrocarbons, C ₁₂ , all other, including mixtures	02	89,000
Hydrocarbons, C ₁₃ fraction	02	51,200
Hydrocarbons, C ₁₄ -C ₁₅ mixtures	02	43,000
Hydrocarbons, C ₁₆ mixtures	02	48,000
Hydrocarbons, C ₁₇ mixtures	02	67,000
Hydrocarbons, C ₁₈ -C ₁₉ mixtures	06	722,000
Hydrochloric acid	07	43,500
Hydrocodone bitartrate	06	433,000
Hydrocodone	06	680,000
Hydrocodone acetate	06	661,000
Hydrocumarin	07	44,000
Hydrogenated castor oil, ethoxylated	12	670,000
Hydrogenated menhaden fish oil	15	1329,050
Hydrogenated tallow acids, aminoethanolamide, acetate salt	12	575,280
(Hydrogenated tallow alkyl)amine	12	422,000
(Hydrogenated tallow alkyl)amine acetate	12	394,000
(Hydrogenated tallow alkyl)amine, ethoxylated	12	329,000
(Hydrogenated tallow alkyl)trimethylammonium chloride	12	498,000
1-(2-Hydrogenated tallow amidoethyl)-2-nor(hydrogenated tallow)-2-imidazoline	12	386,500
Hydrogenated tallow, fatty acid aminoethanolamine condensate	14	488,000
Hydrogenated tallow glycerides	15	1329,000
Hydrogenated tallow glycerides diethylenediamine condensate	12	587,943
Hydrogenated tallow glycerides diethylenetriamine	12	587,943
Hydroquinone mixtures	14	113,000
Hydroquinone hydrochloride	06	401,400
Hydroquinone (Hydroquinol)	14	357,000
Hydroquinone, di(β-hydroxyethyl) ether	15	91,250
Hydroquinone sulfonic acid, potassium salt	15	91,300
D-Hydroxybenzoic acid	03	934,000
D-Hydroxybenzoic acid	03	946,000
D-Hydroxybenzoic acid, butyl ester	15	92,000
D-Hydroxybenzoic acid, ethyl ester	15	93,000
D-Hydroxybenzoic acid, methyl ester	15	95,000
D-Hydroxybenzoic acid, propyl ester	03	948,000
4-Hydroxybenzobenzene	06	175,000
Hydroxychloroquine sulfate	07	44,050
Hydroxycitronellal	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
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (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
3-[N-(2-Hydroxyethyl)amino]propanitrile	03	956,000
Hydroxyethylcellulose	14	409,000
N-β-Hydroxyethyl-2,4-dihydroxybenzamide (2-Hydroxyethyl)dimethyl(3-stearamidopropyl)ammonium	03	958,000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)ammonium phosphate	12	472,000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)ammonium nitrate	12	474,000
(N-(2-Hydroxyethyl)-1,2-diphenylethylenediamine (N-Hydroxyethylthylenedinitrilo)triacetic acid, Iron salt	12	351,000
(N-Hydroxyethylthylenedinitrilo)triacetic acid, magnesium salt	14	72,000
(N-Hydroxyethylthylenedinitrilo)triacetic acid, sodium salt	14	73,000
(N-Hydroxyethylthylenedinitrilo)triacetic acid, trisodium salt	14	74,000
Hydroxyethyl hydroxypropyl cellulose	14	409,500
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-capryl-2-imidazolinium hydroxide	12	26,600
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-nor-coconut oil fatty acids-2-imidazolinium hydroxide	12	26,700
N-(2-Hydroxyethyl)-12-hydroxystearamide	15	395,200
Hydroxyethylidene diphosphonic acid, potassium salt	14	75,000
Hydroxyethylidene diphosphonic acid, sodium salt	14	76,000
Hydroxyethyl methacrylate	15	1119,200
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	12	348,000
1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2-imidazoline	12	349,000
1-(2-Hydroxyethyl)-2-nor(soya oil alkyl)-2-imidazoline	12	351,600
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	12	350,000
N-(2-Hydroxyethyl n-octyl sulfide)	13	233,010
N-(Hydroxyethyl)pyberazine	15	96,000
3-Hydroxy-2-ethyl-4-pyrone (Ethylmatol)	07	97,000
1-(2-Hydroxyethyl)-1-(sodium carboxymethyl)enoxyethylene)-2-nor-coconut oil fatty acids-2-imidazolinium hydroxide	12	26,900
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazoline, fatty acid salt	12	351,700
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl)thylenediamine	12	330,000
Hydroxyethyl-2-undecyl-2,3-imidazoline	12	464,000
5-Hydroxyisophthalic acid	03	962,500
2-Hydroxy-3-(lauryl-myristyl)oxy-1 propane sulfonic acid, sodium salt	12	207,050
3-Hydroxy-4-methoxybenzaldehyde (Iso-vanillin)	07	44,200
4-Hydroxy-3-methoxybenzaldehyde [Vanillin]	07	44,300
2-Hydroxy-4-methoxybenzophenone	15	97,000
4-(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillylacetone)	07	44,800
2-[(1-Hydroxyethyl)amino]-2-methylpropanol	13	245,014

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Sect. Item No.
2-Hydroxymethylene-17 α -ethylandrost-17 β -ol-4-en-3-one	03	969 010
2-(Hydroxymethyl) ethanol	13	245 012
N-(Hydroxymethyl) formamide	15	244 950
Hydroxymethyl-3,5-hydroquinone	15	99 500
Hydroxymethyl(methyl) dithiocarbamic acid, potassium salt	13	185 500
2-(Hydroxymethyl)-2-methyl-1,3-propanediol	15	1086 000
2-(Trimethylolammonium) ethane	15	401 000
4-(Hydroxymethyl)nitromethane	15	823 000
4-(4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol) carboxylic acid (L-lysine))	07	97 200
3-Hydroxy-2-methyl-4-pyrone (Maltol)	07	98 000
3-Hydroxy-N-(3-N-morpholino- τ -propyl)-2-naphthamide	03	972 500
6-Hydroxy-2-naphthalenesulfonic acid	03	983 000
1-Hydroxy-2-naphthoic acid (B.O.N.)	03	990 000
3-Hydroxy-2-naphthoic acid, ethanamide	03	992 000
1-Hydroxynaphthoic acid, methyl ester	03	992 302
3-Hydroxy-2-naphthoic acid, methyl ester	03	990 500
4-Hydroxy-2-naphthoic acid, sodium salt	03	993 000
4-Hydroxynonan-1,7-lactone (τ -Nonalactone)	07	994 802
1-Hydroxy-6-octadecyloxy-2-naphthalene carboxylic acid	15	99 700
2-Hydroxy-4-n-octoxybenzophenone	15	99 750
p-Hydroxy phenylbutanone	07	44 850
o-D,p-Hydroxyphenylglyche methyl ester K	15	100 200
Hydroxyprogesterone	06	679 600
Hydroxypropyl acrylate	12	1120 000
Hydroxypropyl ammonium cyano acetate	15	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-quinolonesulfonic acid	08	261 000
4-Hydroxyundecanoic acid, τ -lactone (τ -Undecalactone)	07	101 000
Hydroxyzone parnosate	06	502 000
Hygromycin B	08	66 000
Imuprofen	08	401 500
Imazaquin 2,4,5-dihydro-4-methyl-4-(1-methylthio)-5-oxo-1H-imidazol-2-ylquinoline-carboxylic acid	13	118 075
Imazethiobenz methyl ester (I22Z,283)	13	118 074
2-Imidazolidinone modification	03	1005 100
2-Imidazoline-1-(2-aminoethyl)-2-(tall oil alkyl), ethoxylated	12	330 050
Imidazoline from tall oil fatty acids and diethylenetriamine	14	164 000
Imidazolium, 1-carboxymethyl)-4,5-dihydro-1-(hydroxyethyl)-2-nor(cococalkyl), hydroxides, monosodium salts	12	474 400
Imidazolium, 1-(carboxymethyl)-2-heptyl-1-(2-hydroxyethyl), hydroxide, sodium salt	12	474 430
Iminodiacetic acid	15	403 000
Imipenem	06	62 100
Imipramine hydrochloride	06	528 000
5-Indanol	03	1012 500
1,2,3-Indantrione monohydrate (Ninhydrin)	15	103 000
Indole	07	45 000
Indomethacin	06	402 000
Insect attractants, all other	13	120 000
Insulin	06	694 000
Insulated glycerol	06	586 000
Iodinated (Not otherwise halogenated) hydrocarbons, all other	15	1281 000
Iodobutane	15	1277 900
Iodoethoxyhydroquin	06	176 000
Iodoethane (Ethyl iodide), non-medical	15	1278 000
Iodoform	06	262 000
1-Iodoperfluorohexane	15	1288 000
1-Iodoperfluorohexane	15	1288 000
3-Iodo-2-propynyl butylcarbamate	13	245 013
Iohexol	08	586 000
Ionone (α - and β -)	07	104 000
α -Ironone	07	102 000
Iothalamate, meglumine	06	570 000
Iron t- α -alkylcarboxylate	15	670 000
Iron 2-ethylhexanoate	15	636 000
Iron naphthenate	14	303 000
Isoalk naphthide	03	1016 700
Isoamyl caprate	07	157 400
Isoamylene	02	54 203
Isoamyl phenylacetate	07	45 300
Isoamyl propionate	07	157 700
Isoamyl salicylate	15	667 000
Isoascorbic acid (Erythorbic acid)	15	533 000
Isoascorbic acid, sodium salt (Sodium erythorbate)	15	105 000
Isoboronyl acetate	07	105 300
Isoboronyl methyl ether	07	105 200
Isoboronyl propionate	07	105 300
Isobutane (2-Methylpropane)	02	50 000
Isobutanol, ethoxylated and sulfated, ammonium salt	12	275 200
Isobutyl acetate	15	892 000
Isobutyl acrylate	07	158 000
Isobutyl alcohol (isopropylcarbinol)	15	987 000
Isobutyl aluminum chloride	15	849 000
Isobutylbenzene	15	1361 500
Isobutylbenzyl	03	1016 750
Isobutyl-2-butenoate	03	1016 000
Isobutyl butyrate	07	158 003
Isobutyl chloroformate	07	158 005
Isobutyl methacrylate	15	988 000
Isobutyl methacrylate	02	51 000
Isobutyl methacrylate	15	989 000
Isobutyl methacrylate	15	989 500

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Isobutyl oleate	92 300	Is-octyl oleate	11 92-600
Isobutyl phenylacetate	46 000	Is-octylphenol, ethoxylated	12 745-000
Isobutylnitroline	46 400	Isocetyl phosphate	12 100-400
Isobutyl salicylate	47 000	Isocetyl phosphate, potassium salt	12 100-420
Isobutyl stearate	11 121 390	Isocetyl phosphate and sulfonated, sodium salt	12 207-100
Isobutyltrimethoxysilane	15 1387 600	Isopentane (2-Methylbutane)	02 53-000
Isobutyraldehyde	796 000	Isopentyl acetate (isocamyl acetate)	07 139 950
Isobutyric acid	534 000	Isopentyl benzoate	07 47-700
Isobutyric anhydride	535 000	Isopentyl butyrate	07 139-000
Isobutyronitrile	443 000	Isopentyl formate	07 160-000
Isobutyrophenone	1016 800	Isopentyl isovalerate	07 161-000
Isobutyryl chloride	536 000	Isopentyl salicylate	07 46-000
Isocetyl stearate	971 000	Isophtalic acid (Benzene-1,3-dicarboxylic acid)	03 1031-000
Isocetyl acrylate	990 000	Isophtalic acid, dimethyl ester	03 1032-000
Isodecyl alcohol	857 500	Isophthalic anhydride	03 1034-000
Isodecyl alcohol, alkoxylated	730 150	Isophthaloyl chloride	02 94-000
Isodecyl alcohol, ethoxylated	760 900	Isoprene (2-Methyl-1,3-butadiene)	12 574 000
Isodecyl alcohol, ethoxylated and propoxylated	760 910	Isopropandiamine condensates, all other	12 1362-000
Isodecyl diphenyl phosphate	12 12 500	Isopropylamine	15 330-270
Isodecyl mercaptoacetate	11 990 100	Isopropylamine, mono	15 385 000
Isodecyl methacrylate	990 700	Isopropylamine, mono benzene sulfonyl	15 386-000
Isodecyl propylamine	330 100	Isopropylamino benzene sulfonyl	15 287-000
Isodecylxypropylamine, ethoxylated	330 103	Isopropylaminoethanol	12 137-400
3-(3-Isodecylxy)propylamine	12 330 350	2-(dodecyl)benzenesulfonyl titanate	15 411-000
Isodecylxypropylamine, monosodium salt	12 330 420	Isopropylbenzyl	03 1035-118
N-Isodecylxypropyl trimethylene diamine	12 85 000	Isopropyl chloroformate	15 994-000
Isodecylxypropyl amine propoxylated acetate	06 439 001	Isopropyl (3-chlorophenyl)carbamate (CIPC)	15 174-000
Isodurane	02 69 000	Isopropyldecalone	07 108-210
Isoheptane	15 857 700	Isopropyl ether	15 1319-000
Isoheptyl alcohol	165 720	5,5'-Isopropylidenebis(2-hydroxy-m-xylene- α , α -diol)	03 1037-000
Iso-Hexadecyl succinic anhydride	02 66 000	4,4'-Isopropylidenebiphenol (Bisphenol A)	03 1038-000
Isohexane	47 200	4,4'-Isopropylidenebiphenol, ethoxylated	03 1039-000
Isohexenyl tetrahydrobenzaldehyde (Myrac aldehyde)	07 105 800	4,4'-Isopropylidenebiphenol, propoxylated	03 1040-000
Isologipolene epoxide	07 106 000	Isopropyl linoleate	15 972-000
Isomenthone	07 106 000	Isopropyl mercaptan (2-Propanethiol)	15 96 030
Isonanolic acid, mono- and triethanolamine salt	12 564 150	Isopropyl-11-methoxy-3,7,11-trimethyldodeca-2,4-dienoate	13 231-014
Isonanolic acid, sodium salt	12 57 570	Isopropyl myristate	11 88-000
Isonanoylamidocaproic acid, triethanolamine salt	03 1027 503	Isopropyl/naphthalenesulfonic acid	12 170 000
Isocotharnide	1027 503	Isopropyl oleate, sulfated, sodium salt	12 280-000
Isocotinic acid	1027 900	Isopropyl palmitate	11 98-000
Isocotlonitrile	1029 000	o-Isopropylphenol	03 1041-000
Isocyanoyl chloride	536 730	N-Isopropyl-N'-phenyl-p-phenylenediamine	09 63-000
Isocyanoyl alcohol	858 000	Isopulegol acetate	11 121-000
Isomonyloxypropylamine	330 500	Isostearamidepropyl dimethylamino glycolate	07 106-220
Is-octadecylsuccinic anhydride	165 750	Isostearic acid, aminoethylethanolamide, acetate salt	12 474-500
Is-octadecyl alcohol	858 800	Isostearic acid, isopropyl titanium salt	12 575-340
Isocetanol acid, calcium salt	672 600	Isostearic acid, mixed isopropanolamines salt	12 29-490
Isocetanol acid, lead salt	672 700	Isostearic acid, triethanolamine salt	12 29-500
Isocetanol acid, manganese salt	672 800	Isostearic amphoterionate	12 13-100
Isocetanol acid	990 900	Isostearyl alcohol, ethoxylated	12 730-200
Isocetyl acrylate	15 959 000		
Is-octyl alcohol, ethoxylated	12 761 000		
Is-octyl alcohol, ethoxylated hydrogen phosphate	15 1033 000		
Is-octyl mercaptoacetate	15 991 000		
Is-octyl-3-mercaptopropionate	15 992 000		

Table D-1—Continued
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Chemical name	Sect. Item No.	Sect. Item No.
Isostearyl isostearate	15	972,300
Isostearyl neopentanoate	15	995,000
Isothiocyanic acid, phenyl ester	03	1043,102
Isotrityloxypropylamine	12	330,300
N-Isotrityloxypropyl trimethylene diamine	12	330,320
Isovalerone (Dilobutyl ketone)	15	824,000
2-Isovaleryl-1,3-indandione	13	169,900
Itaconic acid (Methylenesuccinic acid)	15	539,000
Ivermectin	06	133,001
Kanamycin	06	50,000
Ketamine hydrochloride	06	437,000
Ketones, all other	15	839,000
Ketoprofen	06	402,400
Lactic acid, 100%	15	542,000
Lactic acid salts, all other	15	675,000
Lanolin, ethoxylated	12	671,000
Lard oil acids (ratio=1/1)	12	293,000
Lard, sulfated, sodium salt	12	546,600
Lasalocid, sodium	08	66,600
Latec type polyvinylidene chloride resins	08	50,010
3-Lauramido-N,N-dimethylpropylamine oxide	12	397,000
(3-Lauramidopropyl)trimethylammonium methyl sulfate	12	475,000
Lauric acid	12	570,000
Lauric acid (Ratio = 1/1)	12	547,000
Lauric acid (Ratio = 1/1)	12	584,300
Lauric acid (Ratio = 2/1)	12	534,000
Lauric acid esters, all other	11	87,000
Lauric acid, potassium salt	12	98,000
Lauric acid salts, all other	15	679,000
Lauric acid, zinc salt	15	575,000
Lauric and myristic acid (Ratio = 1/1)	12	571,200
Lauric and myristic acids	12	535,000
Lauric and myristic acids (Ratio = 2/1)	12	584,400
Lauric and myristic acids (Ratio = 1/1)	15	446,000
Lauronitrile (Dodecyl nitrile)	15	543,000
Lauryl chloride	15	1296,400
Lauryl peroxide	15	244,000
N-Lauroylsarcosine, sodium salt	12	995,270
Lauryl acrylate	12	100,700
Lauryl alcohol, phosphated, potassium salt	14	489,250
Lauryl alkyl dimethylamine acetate	14	489,260
Lauryl alkyl dimethylamine phosphate	12	13,400
Laurylamidopropyl betaine	12	13,500
Laurylalcohol	12	936,000
Laurylmethacrylate	15	997,000
Lauryl methacrylate-stearyl methacrylate copolymer resins	08	19,980
Lauryl pyridinium chloride	12	498,500
Lead acetate	15	595,000
Lead t- α -alkylcarboxylate	15	670,500
Lead-cobalt neodecanoate	15	706,000
Lead 2-ethylhexanoate	15	637,000
Lead/iron tetracarboxylate salt	15	104,778
Lead naphthenate	14	306,000
Lead neodecanoate	15	707,000
Lead stearate	15	756,000
Lead stearate, dibasic	15	595,000
Lead subacetate	15	577,000
Lead tallate	15	1176,000
Leuco Sulfur Black 1	04	110,000
Leuco Sulfur Black 2	04	115,000
Leuco Sulfur Black 11, 11:1	04	111,000
Leuco Sulfur Black 18	04	115,018
Leuco Sulfur Blue 7	04	1075,000
Leuco Sulfur Blue 11	04	1089,000
Leuco Sulfur Brown 1, 1:1	04	1089,000
Leuco Sulfur Brown 3	04	1091,000
Leuco Sulfur Brown 37	04	1101,000
Leuco Sulfur Brown 52	04	1101,052
Leuco Sulfur Brown 96	04	1104,996
Leuco Sulfur Green 2	04	1084,000
Leuco Sulfur Green 16	04	1087,000
Leuco Sulfur Green 34	04	1087,034
Leuco Sulfur Green 35	04	1087,035
Leuco Sulfur Green 36	04	1087,036
Leuco Sulfur Red 14	04	1070,014
Leuco Sulfur Yellow 22	04	1064,022
Leuprolide acetate	06	278,600
Lidocaine	06	535,000
Lidocaine hydrochloride	06	706,100
Light-oil distillates, all other	06	706,100
Lignin amine	01	9,000
Lignin, ethoxylated	12	357,010
Lignin, sodium salt	12	161,900
Lignosulfonic acid, ammonium salt	12	318,400
Lignosulfonic acid, calcium salt	12	153,000
Lignosulfonic acid, chromium salt	12	154,000
Lignosulfonic acid, iron salt	12	154,000
Lignosulfonic acid, manganese salt	12	157,100
Lignosulfonic acid, mixed chromium and iron salts	12	157,200
Lignosulfonic acid, potassium salt	12	157,700
Lignosulfonic acid, sodium salt	12	158,000
Lignosulfonic acid, zinc salt	12	158,500
Limonene	07	50,200
Limonene anthranilate	07	49,500
Limonenyl (animal feed grade)	06	67,000
Limonenyl (medical grade)	06	51,000
Limonenyl alcohol, sulfated, all other	12	240,000
Linoleic acid (Ratio = 1/1)	12	547,800
Linoleic acid (Ratio = 2/1)	12	536,000
Linoleic acid dimers, alkoxylated	12	711,200
Lipase	14	114,000
Lipoic acid	06	327,300
Lipoic acid, zinc salt	06	657,000
Lithium heparin	15	1373,500
Lithium hydroxystearate	15	708,000
Lithium neodecanoate	15	758,000
Lithium stearate	15	379,000
Lovastatin	06	579,000
Loxapine succinate	06	503,700
Lubricating oil and grease additives, acyclic, all other	14	293,000

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Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Lubricating oil and grease additives, cyclic, all other	14	Meperidine hydrochloride	06
2,6-Lutidine	294,000	Meprednisone	06
3,4-Lutidine	1047,000	Mercaptoacetic acid (Thioglycolic acid)	15
Malenide	03	2-Mercaptobenzothiazole	09
Malenide acetate	202,300	2-Mercaptobenzothiazole, copper salt	09
Magnesium acetate	598,000	2-Mercaptobenzothiazole, sodium salt	13
Magnesium bis(4-nitrobenzylmalonate) dihydrate	1048,700	2-Mercaptoethanol	09
Magnesium gluconate	1764,000	N-(Mercaptoethyl)phthalimide S-(O,O-dimethylphosphorodithioate)	15
Magnesium methylete	1352,500	3-Mercapto-1,2-propanediol (Thioglycerol)	13
Magnesium stearate	262,500	3-Mercaptopropionic acid	15
Maleic acid, monoalkyl ester	759,000	Mercaptopropyltrimethoxysilane	15
Maleic anhydride	44,500	Mercaptosuccinic acid (Thiomalic acid)	15
Maleic anhydride, polypropylene glycol copolymer	12,711,700	2-Mercaptotoluidimazole, zinc salt	09
Malic acid	547,000	Metaxalone	06
Malonalide	1048,930	Methacrylamide	15
D-Maltose	459,000	Methacrylic acid	15
Manganese acetate	599,000	α-Methacryloxypropyltrimethoxysilane	15
Manganese t-α-alkylcarboxylate	15	Methadone hydrochloride	06
Manganese 2-ethylhexanoate	81,000	Methamphetamine hydrochloride	06
Manganese gluconate	639,000	Methane	02
Manganese gluconate	765,000	Methanesulfonic acid, disodium salt (DSMA)	13
Manganese naphthenate	309,000	Methanesulfonic acid, dodecyl- and octyl- ammonium salts	13
Manganese neodecanolate	709,000	Methanesulfonic acid, monosodium salt (MSMA)	13
Manganese stearate	760,000	Methanesulfonic acid	15
Manganese tallowate	177,000	Methanesulfonyl chloride	15
Mannitol	1087,000	Methanol, synthetic	15
Maprotiline hydrochloride	529,000	Methanamine	06
Mecizline hydrochloride	81,000	Methanamine mandelate	06
Meclofenamate, sodium	402,500	Methiazole	14
Meclofenamic acid	802,600	Methionine (animal feed grade)	14
Medichol chemicals, all other	630,000	Methionine, hydroxy analogue, calcium salt	14
Medroxyprogesterone acetate	662,000	Methoxyacetone	06
Mefenamic acid	403,000	o-Methoxybenzaldehyde	07
Mefenamic acid	680,500	p-Methoxybenzyl alcohol	07
Megestrol acetate	680,500	2-Methoxyethyl (Ethylene glycol monomethyl ether)	03
Melamine	1050,000	2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	15
Melamine formaldehyde methanol polymer	483,000	2-(2-(2-Methoxyethoxy)ethoxy)ethanol (Triethylene glycol monomethyl ether)	15
Melamine-formaldehyde resins	14	2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	15
Melamine formaldehyde copolymer	489,500	1-Methoxy-2-ethyl acetate	15
Melamine stearyl alcohol polymer	14,490,000	2-Methoxyethyl acrylate	15
Melengestrol acetate	681,000	Methoxyethyl morpholine	15
p-Mentha-1,3-diene (α-Terpinene)	07,107,600	2-Methoxyethylpiperidine	03
p-Mentha-1,4-diene (r-Terpinene)	107,700	N-(4-Methoxy-3-nitrophenyl)acetamide	07
p-Mentha-1,6-diene (Limonene)	50,000	Methoxyphenamine hydrochloride	03
di-p-Mentha-1,8-diene (Limonene)	103,800	4-Methoxyphenol	15
p-Mentha-6,8-dien-2-ol (Carveol)	103,800	1-p-Methoxyphenyl penten-1-one-3 (α-Methyl-anisalacetone)	07
p-Mentha-6,8-dien-2-yl acetate (Carvone, Carvol)	107,100	3-(2-Methoxyphenyl)-2-propanol	07
p-Mentha-6,8-dien-2-yl acetate (Carryl acetate)	107,100		
p-Mentha-5-en-3-one (Isopulegone)	108,300		
p-Mentha-4,8-en-3-one (Pulegone)	108,400		
1-p-Mentha-8-yl-1-propanone	108,700		
di-Menthol synthetic	108,600		
Menthyl acetate	110,100		
Menthyl acetate	111,100		
	111,100		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
Methoxypolyethylene glycol	15	1172 000	2-Methyl-1-butanol	15	841 000
2-Methoxy-1-propylphenol	07	54 000	3-Methyl-1-butanol	15	841 001
3-Methoxy-4-propylphenol acetate	07	54 100	3-Methyl-2-butenyl acetate	07	162 012
1-Methoxypropionitrile	15	448 200	3-Methyl butyl acetate	07	162 450
3-Methoxypropylamine	15	417 000	Methyl-1-(butylcarbamoyl)-2-benzimidazolecarbamate (Genomyl)	07	162 453
2-Methoxy-4-propylphenol	07	54 150	Methyl-t-butyl ether	13	24 900
Methscopolamine bromide	06	620 700	Methylbutyl pyrophosphate, ethylenedioxy titanium salt	14	184 000
Methsuximide	06	421 000	Methyl butynol	12	100 200
Methyl 3-	13	118 072	Methyl butyrate	07	162 020
N-Methylacetamide	15	248 000	Methylcellulose	15	1006 300
Methyl acetate	15	1002 000	Methyl chloroformate	14	411 000
4-Methylacetophenone	07	55 000	2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanolamine salt	15	1008 000
Methyl acrylate, monomer	15	1034 000	2-(2-Methyl-4-chlorophenoxy)propionic acid, iso-octyl ester	13	118 056
Methyl alcohol, alkoxylated	12	730 700	α -Methylcinnamaldehyde	13	118 057
Methylaluminum sesquichloride	15	1363 000	Methyl cinnamate	07	59 000
Methylamine, mono-	15	290 000	Methyl cyanoacetate	07	60 000
Methylaminocetalddehyde dimethyl acetal (MAADMA)	15	418 800	Methyl cyclohexane	03	1063 000
p-Methylaminophenol (N-Methylethanolamine)	15	418 800	α -Methylcyclohexanemethanol	07	111 730
2-Methylaminophenol sulfate (Metol)	14	362 000	3-(N-2-Methyl-N-cyclohexylamino)-6-methyl-7-anilino fluora	15	111 100
3-Methylaminopropylamine	15	292 200	1-(2-Methylcyclohexyl)-3-phenylurea (Siduron)	15	111 200
Methyl ammonium chloride	15	419 150	Methylcyclopentadiene	13	76 000
Methyl (tri-hydrogenated tallow alkyl) ammonium chloride	12	498 900	Methylcyclopentanediol	02	65 500
Methyl-t-amyly ether	14	183 000	Methylcyclooctadiene	14	185 000
2-(N-Methyl)anilino ethanol	03	1071 000	2-Methyldecanal	07	162 458
3-(N-Methyl)anilino propionitrile	03	1071 000	Methyl-3,5-di-tert-butyl- γ -hydroxyhydrocinnamate	15	111 500
p-Methylanisole	07	56 000	Methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-3-cyano-3-phenoxycyclopropanecarboxylate	13	166 035
Methyl anthranilate	07	57 000	Methyl 5-(2,4-dichlorophenoxy)-2-nitrobenzoate	13	166 035
2-Methylanthraquinone	03	1075 000	Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxate	03	1084 150
Methylaziridine	15	110 000	Methyl didecylamine	12	442 800
B-Methylbenzene propanal	07	57 070	Methyl dihydrogen phosphate	15	1034 000
Methylbenzene sulfonate	15	110 150	5-Methyl-1,7-dihydroxy-1,3,4-triazadiazoline	14	366 000
Methyl-2-benzimidazole carbamate	03	1464 300	Methyl 2-(4,6-dimethoxypyrimidin-2-yl) (Benzulfuron) (Londax)	13	76 045
Methyl benzoate	07	57 100	Methyl N',N'-dimethyl-N-((methylcarbamoyl)oxy)-1-thioxamide	13	231 010
Methyl-p-benzoquinone	15	110 200	Methyl 2-[[[[(4,6-dimethyl-2-pyrimidinyl) amino]carbonyl]amino]sulfonyl]benzoate	13	118 055
2-Methylbenzothiazole	03	1078 000	2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	03	1084 700
o-Methylbenzoyl chloride	14	365 000	4-Methyl-2,6-dinitrophenol	03	1084 703
4-Methylbenzoyl chloride	03	1078 700	N-Methylodotocacylamine	12	443 000
o-Methylbenzoyl acetate (Styralyl acetate)	07	58 000	N-Methylodicyclohexylamine	12	465 230
Methylbenzyl alcohol	03	1079 200	Methyl dioleil ethoxy ammonium methyl sulfate	12	465 163
N-Methylbenzylamine	03	1079 200	N-Methyl-dithiolomethylammonium methosulfate	13	187 012
N-Methylbis (cocoon oil alkyl) amine	12	441 000	N-Methyl-dithiocarbamic acid, potassium salt	13	241 000
Methyl-bis-diospropylamine	03	1080 200	N-Methyl-dithiocarbamic acid, sodium salt (Metham)	13	241 000
N-Methylbis (hydrogenated tallow alkyl) amine	12	442 000	Methyl-dopa	06	358 000
N-Methylbis (hydroxyethyl) hydrogenated tallow alkylammonium chloride	12	465 120	Methyl ethylenebis (6-tert-butyl-p-cresol)	09	91 000
Methyl, bis-(2-hydroxyethyl) isodecylpropylammonium chloride	12	465 135	2,2'-Methylenediis (6-tert-butyl-4-ethylphenol)	09	90 000
Methyl, bis-(2-hydroxyethyl) isodecylpropylammonium chloride	12	465 140	4,4'-Methylenediis (2,6-di-tert-butylphenol)	03	1088 100
Isotridecylpropylammonium chloride	12	465 160			
Methyl, bis-(2-hydroxyethyl) soyaalkylammonium chloride	12	465 160			
Methyl bromide (Bromomethane)	13	240 000			

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
4,4'-Methylenebis[N,N-diethylaniline]	03	Methyl methacrylate-butadiene styrene (MBS) resins	08
4,4'-Methylenebis[N,N-dimethylaniline]	03	Methyl methacrylate, monomer	15
4,4'-Methylenebis[2-(dimethylhydantoin) and derivatives]	14	N-Methyl-methanamine with borane (1:1)	15
2,2'-Methylenebis(4-methyl-6-nonyl-p-cresol)	03	Methyl 2-[4-methoxy-6-methyl-1,3,5-triazin-2-yl]amin carbonyl amino sulfonyl benzotriazole (Metsulfuron methyl)	13
Methylenebis(thiocyanate)	13	Methyl 2-[[[[N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl)thylamino]carbonyl]amino]sulfonyl]benzoate	13
Methylene-bridged polyalkyl phenols	14	Methyl N-methylanthranilate	07
Methylene chloride (Dichloromethane)	15	Methyl-2-methyl butyrate	07
4,4'-Methylenedianiline	03	S-N-Methyl-N-[(methylcarbamoyloxy)thioacetimidate (Methomyl)]	13
1,2-Methylenedioxy-4-propylene benzene (isoSafrole)	07	4-Methyl-3,4-methylene dioxhydrochloramaldehide	07
5,5'-Methylenedioxylic acid	03	4-Methyl-N-(4-methylphenyl)sulfonylbenzenesulfonamide	03
2-Methylene undecanal	07	3-Methyl-N-[2(methylsulfonamidoethyl)-N-ethyl-p-phenylenediamine] sequisulfate monohydrate	14
Methyl esters of coconut oil	15	2-Methyl-2-(methylthio)propanaldehyde O-(methylcarbamoyl)oxime (Aldicarb)	13
Methyl esters of lard	15	4-(Methylmorpholine	15
Methyl esters of tallow	15	Methylnaphthalene	15
N-Methyl-2-ethanopiperidine	03	Methylnaphthalenesulfonic acid, sodium salt	01
Methyl ether (Dimethyl ether)	03	N-Methyl-p-nitroaniline	12
Methyl ethyl ketone	15	4-Methyl-2-nitroanisole	03
Methyl ethyl sulfide	02	2-Methyl-2-nitro-1-propanol	15
α-(1-methylmethyl-x-4-trifluoro-methoxyphenyl)-5-pyrimidinemethanol (Flurpirimolol)	12	3-Methyl-2-[and]nonene nitrile	07
Methyl formate	15	Methylnonylnaphthalenesulfonic acid, sodium salt	12
Methyl formol	15	2-Methyl-1-octyl-1	03
Methyl p-formylbenzoate	03	Methyl olate, sulfated, sodium salt	11
Methyl furan	15	N-Methyl-N-oleoyltaurine, sodium salt	12
Methylglucoside laurate	12	N-Methyl-N-palmitoyltaurine, sodium salt	12
1-Methyl-2-(8-heptadecenyl)-1-(9-octadecenyl)amido ethyl	12	Methyl p-tolachloroacetate	15
N-(1-Methylheptyl)ethanolamine	14	2-Methyl-2,4-pentanediol (Hexylene glycol)	15
N-(1-Methylheptyl)-N-phenyl-p-phenylenediamine	09	4-Methyl-2-pentanol	15
5-Methyl-2-hexanone (Methyl isoamyl ketone)	15	N-(1-Methyl-2-pentyl)-N-phenyl-p-phenylenediamine	09
Methyl hexyl ether	07	Methyl pentaol	07
p-Methylhydratropaldehyde	07	Methylphenylacetate hydrochloride	06
Methyl hydrazine, mono	15	N-(3-Methylphenyl)acetamide	06
Methyl(hydrogenated tallow alkyl)diethylamine condensate; polyethoxylated, methyl sulfate	12	Methyl phenylacetate	07
4-Methyl-5-hydroxymethyl imidazole	15	4-(1-Methyl-1-phenyl)ethylphenol	03
Methyl 12-hydroxystearate	07	3-Methyl-5-phenyl-3-pentanol	07
(2,4-Methyl-5-imidazole)imethylthioethylamine dihydrochloride	15	4-Methyl-1-phenyl-3-pyrazolidone	07
2,2'-(1-Methylimino)diethanol (Methyldiethanolamine)	03	1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridone (Fluridone)	14
2-Methylindole	03	4-Methylphthalic acid	13
3-Methylindole (Skatole)	07	4-Methylphthalic anhydride	03
Methylionone(α- and β-)	07	1-Methylpiperidine	03
T-Methylionone	07	3-(2-Methylpiperidino)propyl-3,4-dichlorobenzoate (Pipron)	03
6-Methyl-α-ionone	07	Methyl pivaloylacetate	13
Methyl isobutyl ketone	15	N-Methyl-N-polyoxyethylene-N-N-bis(hydrogenated tallow amidoethyl) ammonium	15
Methyl isobutyrate	07		12
Methyl isocyanate	15		476, 920
Methyl iso-octadecenoate	15		
Methylisopropyl ketone	15		
Methyl isothiocyanate and 1,3-dichloropropene	13		
Methyl isovalerate	07		
2-Methylacetonitrile (Acetone cyanohydrin)	15		
Methyl inoleate	15		
Methyl mercaptan (Methanethiol)	02		

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	12	(Mixed alkyl)ammonium chloride	12
Methyreneisobutene	08	Mixed alkyl ammonium chloride	12
2-Methyl-2-propanamine with borane (1:1)	15	Mixed t- α -alkylcarboxylic acid salts	15
Methyl propionate	07	Mixed alkyl imidazole, alkoxylated	12
Methyl propyl ketone	15	Mixed alkyl phenol, dehydroated	12
Methylpseudobutene	15	(Mixed alkyl)phenol alkylene diamine/kanolamine formaldehyde	12
1-Methyl-2-pyrrolidone, monomer	15	(Mixed alkyl)phenol epichlorohydrin-formaldehyde, alkoxylated	12
Methyl ricinoleate	11	(Mixed alkyl)phenol, ethoxylated	12
Methyl stearate	15	(Mixed alkyl)phenol, ethoxylated, butyl ether	12
α -Methylstyrene	03	(Mixed alkyl)phenol, ethoxylated and sulfated, sodium salt	12
ar-Methylstyrene (Vinyltoluene)	08	(Mixed alkyl)phenol-formaldehyde, alkoxylated	12
α -Methyl styrene polymers	08	Mixed alkyl phenol sulfate, ethoxylated	12
Methyl sulfide (Dimethyl sulfide)	15	triethanolamine salt	12
N-Methyl-N-(tall oil acetyl)saurine, sodium salt	12	Mixed alkyl phosphate	12
Methyl-1-tallowamidoethyl-2-tallowimidazolium-methyl sulfate	12	Mixed alkyl phosphate, diethanolamine salt	12
Methyltallowdiethylenetriamine condensate, polyethoxylated, methyl sulfate	12	Mixed alkyl phosphate, potassium salt	12
Methyltallowdiethylenetriamine condensate	12	N-(Mixed alkyl)polyethylenepolyamine	12
Polypropylene glycol methyl sulfate	06	Mixed alkyl stearate	12
Methyl tetrahydrofuran (Methyl THF)	15	(Mixed alkyl)sulfobetaine	12
Methyltetrahydrothialic anhydride	15	Mixed alpha-olefins and vegetable	12
Methylthiobenzolic acid	03	Mixed animal and vegetable oil, sulfated, sodium salt	12
Methyl thio phacalone oxime	15	Mixed aryl dimides	14
Methylthiosulfonic acid, S-(2-hydroxypropyl) ester	13	Mixed carboxylic acids	12
Methyl tri(C9-10) ammonium chloride	12	Mixed (coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine	12
1-Methyl-3,5,7-triaza-1-azonia tricyclodecane chloride	15	Mixed fatty acid amide with diethylene triamine/ethyl sulfate	12
Methyltrimethoxysilane and polymethylsiloxane	15	Mixed fatty acid-alkoxyethylene condensate	12
Methyltricyclodecanol chloride	12	polyethoxy acids	12
2-Methylundecanol	07	Mixed fatty acids, alkyl ether, ethoxylated	12
Methyl vinyl ether	15	Mixed fatty acids, diethanolamine condensate	12
Methoclopramide hydrochloride	06	Mixed fatty acids, neutralized	12
Metoprolol tartrate	08	Mixed fatty acids-polyalkylenepolyamine condensate	12
Metronidazole	06	Mixed fish oils, sulfated, ammonium salt	12
Metryrapone	06	Mixed fish oils, sulfated, sodium salt	12
Mexane-1,6-bis(tributyl ammonium bromide)	12	Mixed higher glycol amine (MHGA)	15
Mexylsulfonamidecarboxylic acid, monoethanolamine salt	12	Mixed linear alcohols, alkoxylated, all other	12
Mink amidopropyl dimethyl amine (amine acid ratio=1/1)	12	Mixed linear alcohols, alkoxylated and phosphated	12
Mincocycline	06	potassium salt	12
Minoxidil	06	Mixed near alcohols, ethoxylated	12
Miscellaneous acyclic chemicals, all other	06	Mixed linear alcohols, ethoxylated, benzyl ether	12
Mitomycin	06	Mixed linear alcohols, ethoxylated and carbonated, sodium salt	12
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	12	Mixed linear alcohols, ethoxylated and phosphated	12
Mixed alcohol borates	12		
Mixed alcohols, ethoxylated	12		
Mixed alkanesulfonic acid	12		
Mixed alkane sulfonic acid, sodium salt	12		
3-(3-Mixed alkoxy)propylammonopyrrolamine (Mixed alkyl) amine	12		
(Mixed alkyl) amine, ethoxylated	12		
(Mixed alkyl) amine phosphate	12		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
sodium salt	12 87,010	Myrcene	15 1343,000
Mixed linear alcohols, ethoxylated and propoxylated	12 738,000	Myrcenyl acetate	07 163,800
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	12 276,000	Myristaldehyde	07 164,000
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	12 278,000	Myristic acid (Ratio=1/1)	12 547,900
Mixed linear alcohols sulfated, mixed sodium/cocodihexanolamine salts	12 232,520	Myristic acid esters, all other	11 89,000
Mixed linear alcohols, sulfated, sodium salt	12 233,000	Myristyl alcohol, propoxylated	12 738,300
Mixed linear alcohols, sulfated, triethanolamine salt	12 233,100	Myristyl bromide	03 1418,000
(Mixed linear alkyl)dimethyl ammonium methyl sulfate	12 500,100	Myristyl lactate	15 1213,500
Mixed linear olefin sulfonate	12 212,125	Myristyl myristate	15 979,000
Mixed oleic, lauric, stearic, and palmitic hexacyclic esters	12 692,000	Nadocil	06 358,500
Mixed polyesters	14 284,000	Napacillin, sodium	06 336,000
Mixed (secondary linear alcohol)polyethylene propionic acid, sodium salt	12 45,700	1-Naphthaldehyde	03 1133,800
Mixed tall oil and rosin acids, ethoxylated	12 671,300	Naphthalene	02 17,000
Mixed tridecyl alcohol and 2-ethylhexanol, phosphated, potassium salt	12 87,050	Naphthalene, crude, solidifying at less than 74° C	01 12,000
Mixed vegetable fatty acids, potassium salt	12 59,000	Naphthalene, crude, solidifying at 76° C to less than 79° C	01 14,000
Mixed vegetable fatty acids, sodium salt	12 59,000	2,6-Naphthalenedicarboxylic acid	03 619,000
Mixed vegetable acids (Ratio = 2/1)	12 536,500	Naphthalenesulfonates, all other	12 176,000
Mixed vegetable oils, sulfated, sodium salt	12 307,300	1-Naphthalenesulfonic acid	03 1141,000
Mixed wool grease and tall oil fatty acids	12 308,000	2-Naphthalenesulfonic acid, formaldehyde condensate and salt	14 465,000
Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl) ammonium chloride	12 74,050	Naphthalene sulfonic acid, formaldehyde condensate and 4,4'-dihydroxydiphenyl sulfone	14 466,000
Mixtures not specifically itemized, all other	12 499,600	Naphthalene sulfonic acid, polymer with formaldehyde	12 722,445
Mixtures of alcohols, C- and higher, other	15 1500,000	Naphthalene sulfonic acid, polymer with formaldehyde, sodium salt	12 722,500
Modified rosin (Unsulfonated)	08 883,360	2-Naphthalenesulfonic acid, sodium salt	03 1143,000
Modified rosin esters	08 41,000	Naphthalene sulfonic acid, sodium salt, formaldehyde condensate	12 174,500
Modified succinimides	14 249,500	Naphthalimide	03 310,000
Monethanolamine	06 68,000	Naphthalene diethers, mixed salts	14 310,000
Monopropylamine	15 379,000	Naphtheneic acid, acid number 150-199	02 20,000
Monosulfolacetamide	15 407,000	Naphtheneic acid, acid number 200-224	02 20,000
Monomethyl tin	15 248,100	Naphtheneic acid, copper salt	02 18,000
Mordant Brown 1	15 1404,877	Naphtheneic acid, ethoxylated	13 45,800
Mordant Brown 18	04 871,000	Naphtheneic acids-polyalkylene polyamine condensate	12 361,150
Mordant Brown 33	04 878,000	Naphtheneic condensate	12 281,000
Mordant Brown 70	04 882,000	1-Naphthyl ethoxylated and sulfated, free acid	12 366,090
Mordant Orange 1	04 848,000	Naphthyl ends, all other	05 46,000
Mordant Orange 6	04 850,000	1,2-Naphthoquinone-2-diazide-5-sulfonyl chloride (215-sulfonyl chloride)	15 122,300
Mordant Orange Yellow	04 852,000	Naphthylamine (α -Naphthylamine)	03 1158,000
Mordant Yellow 20	04 842,000	p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2-naphthylamine)	03 1160,000
Morphine sulfate	08 405,500	1-Naphthyl N-methylcarbamate (Carbaryl)	13 150,000
Morpholine	15 121,000	N-1-Naphthylthalamic acid (NPA)	13 77,900
Morpholine salt of gluconic acid	15 122,000	Naphthalene sulfonic acid, polymer with formaldehyde	12 722,450
Morpholine salt of p-toluene sulfonic acid	09 33,000	Naphthalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone, ammonium salt	12 673,000
N-Morpholinyl-2-benzothiazoyl disulfide	14 370,000	Natural fats and oils, ethoxylated, all other	12 673,000
N-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	06 51,500		
Moxalactam	06 51,500		
Mustard seed oil, sulfated, sodium salt	12 309,000		

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<i>Chemical name</i>	<i>Sec't. Item No.</i>	<i>Item No.</i>
(NBR) type	10	12,000
Neat's foot oil, sulfated, sodium salt	12	294,000
Neo-C ₉ -C ₁₂ acids	15	555,970
Neosaloxyl, dodecylbenzene-sulfonyl titanate	12	137,500
Neosaloxyl, tris(4-aminophenyl) titanate	12	331,850
Neosaloxyl, trineodecanoyl titanate	12	59,600
Neosaloxyl, trineodecanoyl zirconate	12	59,620
Neosaloxyl, tris(m-aminophenyl) zirconate	12	331,890
Neosaloxyl, tris(dioctyl) pyrophosphato zirconate	12	102,550
Neodecanol acid	15	556,000
Neodecanoyl chloride	15	557,000
Neodecanoyl chloride	15	557,100
Neohexane (2,2-Dimethylbutane)	02	67,000
Neomycin (medicinal grade)	06	32,000
Neomycin (animal feed grade)	06	69,000
Neopentyl glycol adipate	11	64,500
Neopentyl glycol diglycidyl ether	11	13,17,850
Neopentyl glycol diborate	11	85,890
Neopentyl glycol glutarate	11	94,280
Neophyl chloride	15	12,39,810
Neostigmine methylsulfate	06	5,700
Nestlrich	08	72,000
Niacin (medicinal grade)	06	79,500
Niacinamide (medicinal grade)	06	79,500
Nickel acetate	15	60,000
Nickel 2-ethylhexanoate	15	640,000
Nicotine polacriflex	06	836,000
Nicotinic acid, 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolyl)-1	13	118,073
Nicotinitrile (3-Cyanopyridine)	03	1162,000
Nicotinyl alcohol tartrate	06	373,000
Nicotinyl glycol	06	374,200
Nidoprene	03	137,200
2-Nitro-6-pyrrolidiny] toluene	06	158,000
Nitarsone	06	431,000
Nitroated oil	15	457,000
Nitrated, all other	15	85,000
Nitrobenzoic acid, zinc salt	14	78,000
Nitrobenzoic acid	14	81,000
Nitrotriacetic acid, trisodium salt	14	82,000
Nitrilo-tris-methylene triphosphonic acid	14	83,000
Nitrilo-tris-methylene triphosphonic acid, potas	14	84,000
Nitrilo-tris-methylene triphosphonic acid, sodium salt	14	84,000
5-Nitroaniline	03	1173,000
Nitroaniline	03	1184,000
1-Nitroanthraquinone	03	185,000
Nitrobenzamide	03	187,503
Nitrobenzene	03	190,000
m-Nitrobenzenesulfonic acid, sodium salt	03	195,000
6-Nitrobenzimidazole	14	371,000
o-Nitrobenzimidazole	03	1200,503
m-Nitrobenzoic acid	03	1201,000
p-Nitrobenzoic acid	03	1205,000
4-(2-Nitrobutyl) morpholine	03	122,406
2-Nitro-p-cresol	03	1210,000
5-Nitrodimethylisophthalate	03	1215,150
Nitrodiphenylamine	03	1212,000
Nitroethane	15	439,000
Nitrogenous compounds, acyclic, all other	15	484,000
5-Nitrosophthalic acid	03	1215,000
Nitroethane	15	460,000
3-Nitro-4-methylacetophenone	03	1215,350
p-Nitrophenol	03	1224,000
p-Nitrophenyl alcohol	03	1228,000
p-Nitrophenol, sodium salt	03	1229,000
1-Nitropropane	15	461,000
2-Nitropropane	15	482,000
3-(and 5)-Nitrosalicylic acid	03	1239,000
p-Nitrosophenol	03	1240,000
4-Nitrosophenol, sodium salt	03	1240,100
N-Nitrosophenyldiethylamine salt	03	1241,600
o-Nitrotoluene	03	1243,000
m-Nitrotoluene	03	1243,000
p-Nitrotoluene	03	1243,000
m-Nitrotoluene mixtures	03	1245,500
2-Nitro-4-(trifluoromethylphenyl)acetic acid	03	1246,800
Nizatidine	07	165,000
N-methyl-2-pyrrolidone	15	1344,000
1,3-Nonanediol acetate	15	165,200
Nonanoic acid (Pstargenic acid)	15	559,000
Nonene (Tripropylene)	02	80,000
Nonenylsuccinic anhydride	15	165,770
Nonionic surface-active agents, all other	12	787,000
Nonionic types, polyamide resins	08	27,000
Nonylaldehyde	09	76,700
tert-Nonyl mercaptan	09	171,250
Nonylphenol	03	1262,000
Nonylphenol, alkoxyated/aminated	15	122,462
Nonylphenol, barium salt	14	229,000
Nonylphenol, ethoxylated	12	749,000
Nonylphenol, ethoxylated and carbonated, sodium salt	12	318,640
Nonylphenol, ethoxylated and phosphated	12	82,000
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	12	83,100
Nonylphenol, ethoxylated and phosphated, sodium salt	12	83,200
Nonylphenol, ethoxylated, phosphate esters	12	750,010
Nonylphenol, ethoxylated and propoxylated	12	750,000
Nonylphenol, ethoxylated and sulfated, ammonium salt	12	287,000
Nonylphenol, ethoxylated and sulfated, sodium salt	12	288,000
Nonyl phenol, ethoxylated with mixed fatty acids	12	750,050
Nonylphenol-formaldehyde, alkoxyated	12	723,000
Nonylphenol glycol ether	15	122,470
Nonyl phenol oleate, ethoxylated	12	749,500
Nonylphenol poly(ethyleneoxy)acetic acid, sodium salt	12	45,900
Nonylphenoxypoly(ethyleneoxy)ethyl iodide	12	751,000
Nonylphenyl phosphates, mixed	09	85,000
Nopopentyl glycol dicaprate	15	1126,400
Nopyl acetate	07	115,000
2-Nor-tal oil alkyl-1-tal oil amido-ethyl imidazole	12	361,050
Nortriptyline hydrochloride	06	531,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Noscapine	06	2-Octyldodecyl-12-stearoyl stearate	11
Nosobacil sodium	06	Octyldimethylamine oxide	12
Nylon 6	14	Octyldiphenylamine	09
Nylon 6,6 polymer for fiber, only	14	Octyldiphenylamine, alkylated	09
Nylon 6,6 polyamide resins	08	Octyl formate	07
Nylon 6,6 polyamide resins	08	N-n-Octyl glucamine	15
Nystatin (medical grade)	05	Octyl isobutyrate	17
Octamers	07	2-n-Octyl-4-isothiazolin-3-one	03
Octmethyl acetate	07	Octyl isovalerate	07
Octamryldiphenyl oxide	15	n-Octyl mercaptan	09
Octachlorohydro-4,7-methanoindene	15	Octylmercapto	02
n-Octadecane	15	Octylmethoxy cinnamate	15
Octadecanoic acid, 2-(1-carboxyethoxy)-1-methyl-2-oxoethyl ester, sodium salt	15	Octylphenol	03
1-Octadecanol (Stearyl alcohol)	15	O-Octylphenol, ethoxylated	12
Octadecanetriole (Oleotrifole)	15	O-Octylphenol, ethoxylated and phosphated	12
450 000	15	O-Octylphenol, ethoxylated and sulfated, sodium salt	12
878 000	15	10-Octylphenol, ethoxylated and sulfated, sodium salt	12
9-Octadecenyl acetate, sulfated, sodium salt	12	10-Octylphenol-formaldehyde, ethoxylated	12
267 800	12	Octylphenoxypolyethoxy ethyl sulfate	03
9-Octadecenyl alcohol, ethoxylated	12	Octylphenoxypolyethoxy ethyl sulfate	12
731 000	12	Octyl phosphate	12
84 000	12	Octyl phosphate, alkylamine salt	12
9-Octadecenylamine, ethoxylated	12	Octyl phosphate, isopropoxy titanium salt	12
432 000	12	Octyl phosphate, neotrioxo titanium salt	12
324 000	12	Octyl polyphosphate	12
165 800	15	Octyl polyphosphate, potassium salt	12
113 000	12	Octyl polyphosphate, ethylenedioxy titanium salt	12
412 630	12	Octyl pyrophosphate, neotrioxo titanium salt	12
732 000	12	Octyl pyrophosphate, neotrioxo titanium salt	12
425 000	12	Octyl pyrophosphate, neotrioxo titanium salt	12
396 000	12	Octyl pyrophosphate, neotrioxo titanium salt	12
333 000	12	Octyl pyrophosphate, titanium salt	12
527 670	12	Octyl sulfate, sodium salt	12
Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)propionate	15	N-Octyltriethoxy silane	15
124 000	15	Oil-soluble petroleum sulfonate, all other	15
N-Octadecyl-N,N-di(2-hydroxyethyl)-N-methylammonium chloride	12	Oil-soluble petroleum sulfonate, barium salt	14
465 400	12	Oil-soluble petroleum sulfonate, calcium salt	14
450 100	15	Oil-soluble petroleum sulfonate, calcium salt	14
N-Octadecylsulfosuccinamic acid, disodium salt	15	Oil-soluble petroleum sulfonate, magnesium salt	14
179 000	12	Oil-soluble petroleum sulfonate, mixed salts	14
Octahydro-5-methoxy-4,7-methano-1H-indene, 2-carboxaldehyde	07	Oil-soluble petroleum sulfonate, sodium salt	15
64 600	07	Oleamide (Octadecane amide)	15
166 000	07	Oleamidopropyl betaine	15
1348 000	05	Oleamidopropyl dimethyl amine	15
168 000	02	Oleamidopropyl dimethyl amine	12
75 000	02	Oleamidopropyl dimethyl amine	12
866 000	15	Oleamidopropyl dimethyl amine	12
867 000	15	Oleamidopropyl dimethyl amine	12
831 000	15	Oleic acid (Ratio = 2/1)	12
561 000	15	Oleic acid (Ratio = 2/1)	12
75 700	02	Oleic acid, ammonium salt	12
165 820	02	Oleic acid, diethanolamine salt	12
293 300	07	Oleic acid-N,N-dimethyltrimethylenediamine condensate	12
166 300	07	Oleic acid esters, all other	11
293 100	15	Oleic acid-ethanolamine condensate, ethoxylated	12
293 000	15	Oleic acid-ethylenediamine condensate, ethoxylated and sulfated, sodium salt	12
55 000	11	Oleic acid, mixed isopropanolamine salt	12
500 700	12	Oleic acid, mixed isopropanolamine salt	12
483 200	12	Oleic acid, potassium salt	12
49 000	11	Oleic acid, potassium salt	12

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Oleic acid, sodium salt	61 000	Oxytracycline (animal feed grade)	06 72 000
Oleic acid, sulfated, disodium salt	261 700	Painitic acid esters, all other	11 101 000
Oleic acid, sulfated, sodium salt	291 800	Painitic and stearic acids (Ratio = 2/1)	12 540 000
Oleic acid, triethanolamine salt	291 800	Painitic acid esters, sodium salt	12 63 350
N-(Oleoyloxyisopropyl)sulfosuccinamic acid	180 000	Palmityl chloride	15 567 000
Oleoylamine	251 000	Palm kernel oil acids (Ratio=1/1)	12 549 100
Oleoyl acid phosphate	209 000	Palm kernel oil acids, potassium salt	12 62 890
Oleoyl alcohol, ethoxylated	732 100	Palm kernel oil acids, sodium salt	12 62 900
Oleoyl acetate	16 100	Palm oil acids-ethylenediamine condensate, monoethoxylated	12 379 000
Oleoyl oleate	94 500	Palm oil acids, sodium salt	12 63 000
Oleoyl ethyldiamide oxypopropano sulfonic acid	212 200	Paranthol	06 790 000
Oleoyl sulfate, sodium salt	238 200	Papaverine	14 102 000
Olive oil acids, potassium salt	21 950	Papaverine hydrochloride	06 746 000
Organo-aluminum compounds, all other	1367 000	p-Para-Cymene	07 95 400
Organo-boron compounds, all other	1371 000	n-Paraffins, other	02 85 000
Organo-phosphorus insecticides, cyclic, all other	165 000	n-Paraffins, C ₁₀ -C ₁₄	02 84 000
Organo-silicone compounds, all other	1399 000	n-Paraffins, C ₁₀ -C ₁₆	02 84 250
Organo-in compounds, all other	1407 000	n-Paraffins, C ₁₂ -C ₁₆	02 84 260
Organotin mercaptides	1404 910	n-Paraffins, C ₁ -C ₁	02 81 000
Organotin citrate	265 500	n-Paraffins, C ₂ -C ₆	02 83 000
Other copolymer resins of acrylic and/or methacrylic acid esters	479 500	Paraldehyde	15 1176 500
Other ethylene copolymer resins	20 000	Paraldehydepolyglycine potassium methyl dane salt	03 1121 650
Other homopolymer resins of acrylic and/or methacrylic acid esters	31 800	Peanut oil, sulfated, sodium salt	12 310 000
Other hydrolytic enzymes	20 050	Pectinase	14 116 000
7-Oxabicyclo-[2, 2, 1]-heptane-2, 3-dicarboxylic acid, disodium salt (Endothall)	14 120 000	Pelargonic acid, calcium salt (Calcium nonoate)	15 730 200
Oxalic acid	83 000	Pelargonic acid esters, all other	11 101 500
Oxamide	18 000	Pelargonic acid-tetraethylenepentamine condensate	12 366 000
Oxidized light ends	251 250	Pelargonic alcohol, ethoxylated	12 732 300
Oxidized Fischer-Tropsch wax	1451 000	Pemoline	06 26 000
Oxidized hydrocarbon mixture	566 000	Penicillin V	06 21 000
Oxalalcohol bottoms, sulfated, sodium salt	218 000	Penicillin G, potassium	06 22 000
Oxaluminum isopropoxide	238 500	Penicillin V, potassium	06 29 000
Oxaluminum stearate	1363 050	Penicillin G, procaine (animal feed grade)	06 74 000
Oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	1363 100	Penicillin G, procaine (medicinal grade)	06 23 000
Oxo process bottoms	1273 000	Pentachlorophenol, sodium salt	13 29 000
Oxtriphylene	1451 300	Pentaerythritol	15 1091 000
p,p'-Oxybis(benzenesulfonhydrazide)	745 800	Pentaerythritol esters	14 286 000
Oxybutyn chloride	1363 200	Pentaerythritol stearate	15 1129 000
Oxycodone hydrochloride	109 000	Pentaerythritol tetrakis (3-Mercaptopropionate)	12 715 100
Oxycodone terephthalate	301 500	Pentaerythritol tetraacetate	15 1131 000
Oxydianiline	406 000	Pentaethylenehexamine	15 1131 300
N-Oxydiethylene-2-benzothiazolesulfenamide	406 100	1,1,3,3-Pentamethyl-4,6-dinitroindan (Moskene)	07 294 000
N-Oxydiethylenethiocarbonyl-N'-oxydiethylene-sulfenamide	4,4'-Oxydianiline	N,N',N',N'-Pentamethyl-N-(tallow alkyl)trimethylene-bis[ammonium chloride]	15 294 000
Oxygen-containing quaternary ammonium salts (Except those having amide linkages), all other	34 000	Pentamide isethionate	15 294 000
Oxyphenacylamine hydrochloride	34 100	n-Pentane	12 501 000
Oxyquinoline benzoate (benoxiquine)	467 000	1,5-Pentanediol	06 270 700
Oxyquinoline citrate	302 000	2,4-Pentanedione (Acetylacetone)	15 1092 000
Oxytracycline (medicinal grade)	268 000	1-Pentanol	15 843 000
	269 000	3-Pentanone (Diethyl ketone)	15 835 000
	36 000	Pentazocine	06 416 001
		Pentazocine hydrochloride	06 416 003
		2-Pentene	02 57 000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sec't. Item No.	Chemical name	Sec't. Item No.
Pentenes, mixed	02	1-Phenol-2-sulfonic acid, formaldehyde condensate	14
Pentyl acetate	17	[Phenol-formaldehyde, sulfonated]	03
Pentylamine, mono-	05	Phenolsulfonic acid, sodium salt	03
α -Pentylcinnamaldehyde	07	Phenol, synthetic, all other	03
α -Pentylphenol	03	Phenol, synthetic, by caustic fusion, all other	03
α -Pentylphenol (o-Amylphenol)	07	Phenol, synthetic, from chlorobenzene by vapor-phase hydrolysis, U.S.P.	03
Pepain	14	Phenol, synthetic, from cumene by oxidation, U.S.P.	03
Perchloroethylene (Tetrachloroethane)	15	Phenoxyacetic acid derivatives, all other	13
Perchloromethanethiol (Perchloromethyl mercaptan)	15	Phenoxyacetic acid, sodium salt	03
Perfluoroalkyl polyether	15	3-Phenoxybenzaldehyde	03
Perfluorothiol, C _n -C _m gamma-omega	15	3-Phenoxybenzylamine	06
Peroxyacetic acid (Peracetic acid)	15	Phenoxybenzidine	03
Perphenazine	06	3-Phenoxybenzenesulfenol	03
3,4,9,10-Perylene[2,3,4,9,10-dianhydride	03	2-Phenoxyethanol (Ethylene glycol monophenyl ether)	15
3,4,9,10-Perylene[2,3,4,9,10-dilimide	03	3-(Phenoxyphenyl)acrylates, trans-3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropane carboxylate	07
Pesticides and related products, cyclic, all other	13	Phenol	166 025
Pesticides and related products, acyclic, all other	13	Phenyl acrylate (other than for coating and adhesives)	08
Petroleum hydrocarbon resins	08	Phenyl acetate	25 000
Petroleum sulfonic acid, water soluble (Acid layer), sodium salt	12	Phenyl acetone	1299 750
1,10-Phenanthroline	03	Phenylacetylene	549 000
Phenidmetrazine tartrate	06	Phenylacetylene	06
Phenethyl acetate	07	Phenylacetaldhyde	07 75 000
Phenethyl alcohol	07	Phenylacetaldhyde dimethyl acetal	07 76 000
2-Phenethylamine	03	Phenylacetic acid	07 76 050
Phenethyl bromide	03	Phenylacetic acid isopentyl ester	07 76 055
Phenethyl formate	07	4-Phenylacetophenone	1308 300
Phenethyl isobutyrate	07	Phenyl acid phosphate	129 300
Phenethyl isovalerate	07	Phenyl alanine	16 000
2-Phenethyl phenylacetate	07	α -Phenylalanine	07 76 350
Phenethyl propylcarbamate	12	4-(Phenylazo)diphenylamine	03
Phenethyl salicylate	07	4-(Phenylazo)-1-naphthylamine	03 131 000
Phenethyl sulfate	07	Phenylazobenzene	06 412 000
Phenethylamine	03	4-Phenyl-3-buten-2-one	07 77 000
Phenendamine tartrate	08	Phenylidiodic phosphite	15 129 600
Phenobarbital	08	m-Phenylenebismaleimide	03 1321 200
Phenobarbital, sodium	08	m-Phenylenebismaleimide	09 45 000
Phenol	09	α -Phenylenediamine	03 1320 000
Phenol, alkylated	09	m-Phenylenediamine	03 1319 000
Phenol, benzoylated	12	p-Phenylenediamine	03 1321 000
Phenol, ethoxylated	08	p-Phenylenediamine	03 1321 000
Phenol, ethoxylated and phosphated	12	p-Phenylenediamine, substituted, other	09 65 000
Phenol-formaldehyde resin (with lignite)	12	Phenylglycine bitartrate	06 340 000
Phenol, hindered	09	Phenylglycine hydrochloride	03 1322 000
Phenolic antioxidants, all other	09	Phenyl ether (Diphenyl oxide)	03 1322 650
Phenolic and other tar acid resins	03	d(+)-o-Phenylythylamine	03 1322 025
Phenol, natural, from petroleum, all other	03	Phenylthyl borate	07 77 100
Phenol, natural, from petroleum, U.S.P.	03	Phenylthyl 2-methyl butyrate	07 77 250
Phenol, propoxylated	12	Phenylthyl ligate	07 77 200
Phenol salts, all other	14	N-Phenylylglycine	03 1321 600
Phenols, ethoxylated, all other	12	α -D-Phenylylglycine methyl ester K	15 131 600
Phenol, styrenated	09	Phenylylglycine, potassium salt	03 1322 702
Phenol, styrenated, mixtures	09	Phenylylglycine, sodium salt	03 1323 000
Phenolsulfonaphthalein	03	1-Phenyl-2-hydroxy-2-methyl-propanone-1	15 132 100
Phenolsulfonaphthalein, sodium salt	03	2,2'-[[Phenylimino]diethanol (N-Phenylylidene thanolamine)	03 1327 100
Phenol-sulfonated formaldehyde resin	15		
Phenolsulfonated formaldehyde resin	03		

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Alphabetical chemical index

Chemical name	Sect. Item No.	Item No.
2,2'-(Phenylimino)diethanol, diacetate ester	1327	500
Phenyl-3-mercaptopotrazole	14	375,000
o-Phenyphenol	03	1330,000
p-Phenyphenol	03	1331,000
n-Phenyphenol, sodium salt	03	1333,000
N-Phenylphenylenediamine	03	1334,000
Phenylphosphinic acid	03	1334,100
Phenylphosphinic acid, potassium salt	03	1334,102
Phenylphosphinic acid, sodium salt	03	1334,101
1-Phenyl-1,2-propanedione, 2-oxime	03	1338,000
3-Phenyl-1-propanol (Hydrochloric alcohol)	07	78,000
Phenylpropanolamine	15	134,660
Phenylpropanolamine bitartrate	06	343,500
Phenylpropanolamine hydrochloride	06	343,000
3-Phenylpropyl acetate	07	79,000
3-Phenylpropyl cinnamate	07	79,200
4-Phenylpropylpyridine	03	1339,853
1-Phenyl-3-pyrazolidone	12	377,000
Phenylstyrene, ethoxylated	12	754,080
di-Phenylsuccinic acid	03	1341,009
5-Phenyltetrazole	09	109,200
Phenyltoloxamine citrate	06	104,000
Phenyltrimethyl ammonium chloride	03	1342,400
Phenyl xylol ethane	15	134,800
Phenytolol	06	423,300
Phenytolol, sodium	06	423,600
Phosgene (Carbonyl chloride)	15	1411,000
Phosphated and polyphosphated alcohols, all other	12	111,000
Phosphonate ester, cyclic	15	134,900
2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	14	86,000
N-(Phosphonomethyl)glycine, isopropylamine salt	13	205,950
N-(Phosphonomethyl)glycine, sodium sesqui salt	13	251,582
Phosphoric acid esters, all other	11	16,000
Phosphoric and polyphosphoric acid esters, all other	12	113,000
Phosphorothioates used as lubricating oil and grease additives, all other	14	244,000
Phosphorus acid esters, all other	15	1049,000
Photographic chemicals, all other	14	383,000
Phthalic acid	03	1346,000
Phthalic acid, diallyl ester	11	23,400
Phthalic acid, lead salt, (Dibasic)	15	135,000
Phthalic anhydride	03	1348,000
Phthalic anhydride esters, all other	11	51,000
Phthalic anhydride type alkyl resins	08	2,000
Phthalocyaninato(2-)]copper	03	1351,000
[Phthalocyaninato(2-)]iron	03	1352,000
[Phthalocyaninato(2-)]iron	03	1352,100
[Phthalocyaninetetramethaninato]copper	03	1353,300
Phthalocyaninetetraethylthioyl chloride, copper derivative	03	1353,800
Phthaloyl chloride (Phthaloyl chloride)	03	1355,000
2-Picoline (α -Picoline)	03	1356,000
3-Picoline (α -Picoline)	03	1357,000
4-Picoline (τ -Picoline)	03	1358,000
Picolonitrile (2-Cyanopyridine)	03	1359,100
3-Picolylamine	03	1361,000
Picramic acid, sodium salt	15	136,000
Picric acid (Trinitrophenol)	05	1362,000
Pigment Black 7	05	143,007
Pigment black toners, all other	05	144,000
Pigment Blue 1, (PMA)	05	99,000
Pigment Blue 1, (PTA)	05	100,000
Pigment Blue 2, (PMA)	05	102,000
Pigment Blue 14, (PMA)	05	111,000
Pigment Blue 15, (α form)	05	113,010
Pigment Blue 15:1, (α form)	05	113,020
Pigment Blue 15:2, (α form)	05	113,030
Pigment Blue 15:3, (β form)	05	114,010
Pigment Blue 15:4, (β form)	05	114,020
Pigment Blue 19	05	116,000
Pigment Blue 25	05	119,000
Pigment Blue 61	05	120,061
Pigment Blue 62	05	120,062
Pigment blue toners, all other	05	124,000
Pigment Brown 5	05	140,000
Pigment Green 1, (PMA)	05	125,000
Pigment Green 2, (PTA)	05	128,000
Pigment Green 4, (fugitive)	05	129,000
Pigment Green 4, (PMA)	05	130,000
Pigment Green 7	05	132,000
Pigment Green 8	05	133,000
Pigment Green 10	05	134,000
Pigment Green 36	05	134,260
Pigment Green toners, all other	05	135,000
Pigment Orange 1	05	195,000
Pigment Orange 2	05	20,000
Pigment Orange 5	05	21,000
Pigment Orange 13	05	23,000
Pigment Orange 15	05	24,000
Pigment Orange 16	05	25,000
Pigment Orange 17	05	206,000
Pigment Orange 34	05	25,180
Pigment Orange 43	05	25,270
Pigment Orange 48	05	26,046
Pigment Orange 49	05	26,048
Pigment orange toners, all other	05	26,049
Pigment Red 1, (light)	05	29,000
Pigment Red 2	05	48,000
Pigment Red 3	05	30,000
Pigment Red 4	05	49,000
Pigment Red 5	05	50,000
Pigment Red 13	05	31,000
Pigment Red 14	05	36,000
Pigment Red 17	05	37,000
Pigment Red 21	05	39,000
Pigment Red 22	05	40,021
Pigment Red 25	05	43,000
Pigment Red 23	05	44,000
Pigment Red 31	05	45,000
Pigment Red 36	05	46,000
Pigment Red 41	05	52,000
Pigment Red 48	05	54,000

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Chemical name	Sect. Item No.	Sect. Item No.	
Pigment Red 48:1, (barium)	05 55-100	Pigment Yellow 12	05 8,000
Pigment Red 48:2, (calcium)	05 55-200	Pigment Yellow 13	05 9,000
Pigment Red 48:3, (strontium)	05 55-300	Pigment Yellow 14	05 10,000
Pigment Red 48:4, (manganese)	05 55-400	Pigment Yellow 17	05 1,000
Pigment Red 49:1, (barium)	05 57-000	Pigment Yellow 60	05 6,465
Pigment Red 49:2, (calcium)	05 58-000	Pigment Yellow 75	05 6,465
Pigment Red 52:1, (calcium)	05 61-000	Pigment Yellow 73	05 6,875
Pigment Red 52:2, (manganese)	05 62-000	Pigment Yellow 74	05 6,875
Pigment Red 53, (sodium)	05 63-000	Pigment Yellow 85	05 1,660
Pigment Red 53:1, (barium)	05 64-000	Pigment Yellow 93	05 6,897
Pigment Red 57	05 67-057	Pigment Yellow 98	05 6,897
Pigment Red 57:1, (calcium)	05 68-000	Pigment Yellow 99	05 6,974
Pigment Red 60:1	05 209-000	Pigment Yellow 134	05 11,724
Pigment Red 63	05 70-000	Pigment Yellow 139	05 14,639
Pigment Red 81, (PMA)	05 74-000	Pigment Yellow 152	05 11,752
Pigment Red 81, (PTA)	05 75-000	Pigment Yellow 152	05 11,752
Pigment Red 83	05 77-000	Pigment yellow toners, all other	05 18,000
Pigment Red 88	05 21-000	Phenane hydroperoxide	05 136,200
Pigment Red 101	05 78-000	Phenane hydroperoxide	05 136,500
Pigment Red 112	05 79-101	2-Phenanol (cis and trans)	05 136,800
Pigment Red 122	05 45-810	α -Phenene	05 137,000
Pigment Red 123	05 79-320	β -Phenene	05 138,000
Pigment Red 146	05 40-000	α -Phenene oxide	05 139,500
Pigment Red 147	05 45-847	Phenene, sulfate	05 140,000
Pigment Red 168	05 80-550	Phenene, wood	05 141,000
Pigment Red 169	05 80-555	Phenol, natural, sulfate	05 141,195
Pigment Red 179	05 45-870	Phenol, natural, sulfate	05 141,200
Pigment Red 188	05 80-660	Phenol, synthetic	05 141,200
Pigment Red 190	05 80-688	Piperacillin	05 19,200
Pigment Red 200	05 84-200	Piperazine dihydrochloride	06 123,000
Pigment Red 202	05 84-202	Piperazine hexahydrate	06 126,000
Pigment Red 206	05 84-206	Piperazine hydrochloride	06 126,000
Pigment Red 207	05 84-207	Piperazine sulfate	06 129,000
Pigment Red 209	05 84-209	Piperidine	03 1365,000
Pigment Red 210	05 45-910	Piperonal (1-hellotropin)	07 80,800
Pigment Red 224	05 84-224	Piperylene (1,3-Pentadiene)	02 58,600
Pigment Red 245	05 84-245	Pitch of tar, all other	06 412,500
Pigment Red 63:1, calcium	05 70-001	Pitch of tar: hard (M.P. 161° F and Over)	01 30,000
Pigment red toners, all other	05 86,000	Pitch of tar: medium (M.P. 110° To 160° F)	01 27,000
Pigment Violet 1, (fugitive)	05 88,000	Pitch of tar: soft (M.P. 80° To 109° F.)	01 26,000
Pigment Violet 1, (PMA)	05 89,000	Phthaloyl chloride	05 569,000
Pigment Violet 1, (PTA)	05 89,000	Phthaloyl chloride	05 569,000
Pigment Violet 3, (fugitive)	05 90,000	2-Phthaloyl-1,3-indandione (Phindone)	13 170,000
Pigment Violet 3, (PMA)	05 91,000	Plastics alloys or blends	08 25,200
Pigment Violet 3, (PTA)	05 92,000	Polyacrylamide	14 403,000
Pigment Violet 4, (fugitive)	05 92,004	Polyacrylamide copolymers, all other	14 405,500
Pigment Violet 19	05 93,160	Polyacrylate methacrylate copolymers	14 427,000
Pigment Violet 23	05 93,200	Polyacrylate poly(hydroxypropylacrylate) copolymer	14 428,000
Pigment Violet 29	05 93,229	Polyacrylate	15 570,000
Pigment Violet 39, (PMA)	05 93,439	Polyacrylic acid	14 430,000
Pigment Violet 42	05 94,042	Poly(acrylic acid, ethyl ester)	14 423,000
Pigment violet toners, all other	05 96,000	Poly(acrylic acid, methyl ester)/ethylene/1,1-dichlorosuccinic acid, methylene-	14 424,000
Pigment Yellow 1	05 1,000	Poly(acrylic acid, methyl ester)/ethylene/1,1-dichlorosuccinic acid, methylene-	14 425,000
Pigment Yellow 2	05 1,500		
Pigment Yellow 3	05 2,000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Item No.	Chemical name	Sect. Item No.	Item No.
Polyacrylic acid salts, all other	14	434,000	Polyethylene glycol ester of mixed fatty acids	12	684,700
Polyacrylonitrile and acrylonitrile copolymers	10	13,000	Polyethylene glycol esters of chemically defined acids, all other	12	684,000
Polyacrylonitrile, hydrolyzed	14	435,000	Polyethylene glycol esters of mixed acids, all other	12	684,000
Polyacrylonitrile, hydrolyzed, sodium salt	14	391,000	Polyethylene glycol monoacrylate	12	677,500
Polyacrylonitrile, starch hydrolyzed polymer	13	436,000	Polyethylene glycol monoester of coconut oil acids	12	685,510
Polyallylene polyamines and salts and quats	14	417,500	Polyethylene glycol monoester of soybean oil acids	12	685,700
Polyalkylene oxide	10	13,200	Polyethylene glycol monooleate	12	677,600
Polyalkylene glycol oleate	12	119,050	Polyethylene glycol monolaurate	12	678,000
Polyalcohols	15	1411,150	Polyethylene glycol mono(nonylphenol) ether ammonium sulfate	12	762,970
Polyamine polymethane phosphonic acid	14	87,000	Polyethylene glycol mono-oleate	12	679,000
Polyamine polymethane phosphonic acid, magnesium salt	14	437,000	Polyethylene glycol monopalmitate	12	680,000
Polyamines	12	413,400	Polyethylene glycol monopelargonate, methoxylated	12	680,250
Polyamine (oil of) imidazole	14	437,000	Polyethylene glycol monopelargonate	12	680,200
Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)	08	3,000	Polyethylene glycol monocrotonate	12	681,000
Polybutadiene emulsion-polymerized	10	13,300	Polyethylene glycol monooleate	12	682,000
Polybutadiene resins	08	10,000	Polyethylene glycol monostearate	12	682,250
Polybutadiene, solution-polymerized	10	15,000	Polyethylene glycol monotallate	12	685,900
Polybutene	02	86,000	Polyethylene glycol (mixed ester) of tall oil acids	12	687,000
Polybutylene terephthalate (PBT)	08	30,020	Polyethylene glycol sequester of coconut oil acids	12	689,000
Polybutylene type resins	08	28,000	Polyethylene glycol sequester of tall oil acids	12	690,000
Polybutyl ether carbamate	14	169,000	Polyethylene glycol sequester of tallow acids	12	683,000
Polycarbonate resins	08	29,000	Polyethylene glycol terephthalate	12	683,200
Polycarboxylic acid, alkylate	12	719,210	Polyethylenimine	14	442,000
Polycarboxylic acid, alkylphenoxalkoxyate	12	719,210	Polyethylenimine methyl ammonium sulfate	12	477,250
Polychloroprene (Neoprene) (CR) type	10	17,000	Polyethyleneimine polymer with 1,4-dihydroxy-2-butene	14	171,000
Polydextrose	14	438,000	Polyethylene terephthalate	14	390,000
Poly(diallyldimethylammonium chloride)	14	439,000	Polyethylene terephthalate (PET)	08	30,040
Poly(dimethylimino(2-hydroxytrimethylene)chloride)	14	170,000	Polyglycerol decaoleate	12	692,200
Poly(epichlorohydrin)	12	762,400	Polyglycerol distearate	12	692,500
Polyester resins, saturated, all other	08	30,050	Polyglycerol esters, all other	12	698,000
Polyester resins, unsaturated	08	12,000	Polyglycerol mono-oleate	12	696,000
Polyether amine, ethoxylated	12	334,400	Polyglycerol monooleate	12	697,000
Polyether diols	12	762,730	Polyglycerol tetraoleate	12	697,450
Polyetheretherketone (PEEK) resins	08	33,000	Polyglycol, ethylene glycol and glycol ether, mixed	15	1184,000
Polyether and polyester polyols for urethanes	08	12,050	Polyglycol-toluene diisocyanate reaction product	15	144,500
Polyether polyols based on propylene oxide, all other	15	1187,560	Polyhexafluoropropylene oxide	15	1411,200
Polyether triols	12	762,750	Polyhydric alcohol esters, all other	15	1196,000
Polyethoxy/polypropoxy diacylate dibenzyl ether	12	762,800	Polyhydric alcohol esters, all other	15	1196,000
Polyethoxy propoxy diethylene glycol ether	15	1180,500	Polyhydric alcohol, ethoxylated and phosphated	12	88,800
Polyethylbenzene (80 percent diethylbenzene)	03	1389,000	Polyhydric alcohols, all other	15	1096,000
Poly(ethylene-butylene) glycol	15	1181,050	Polyimides and amide-imide polymers	08	34,000
Polyethylene glycol	15	1181,000	Polyisobutylene succinic anhydride	14	288,000
Polyethylene glycol butyl ether, propoxylated	15	1181,000	Polyisoprene (IR) type	10	85,500
Polyethylene glycol dibenzoate	11	52,000	Polymeric phosphates	09	173,000
Polyethylene glycol diester of coconut oil and oleic acids	12	684,300	Polymerization regulators, acyclic, other	09	173,000
Polyethylene glycol diester of mixed liner acid/oleic acid	12	684,400	Polymers for fibers, all other	14	390,000
Polyethylene glycol diester of tall oil acids	12	684,500	Polymers, water soluble, all other	14	452,000
Polyethylene glycol diurea	12	674,000	Polymethacrylic acid esters	15	1411,300
Polyethylene glycol dimethyl ether	15	1181,200	Polymethacrylic acid, sodium salt	15	441,000
Polyethylene glycol dioleate	12	673,000	Polyethylene polyphenyleneoxyanate	14	1023,000
Polyethylene glycol distearate	12	676,000	Poly(1,1-(methylol)bis[5-chloro-2-propanol]) tetramethylene diamine	14	446,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Poly(methyl methacrylate (PMMA))	08 20,040	Polytetramethylene glycol ether	15 1187,000
Polymethacrylate (PMMA)	08 20,040	Polythiazide	06 725,000
Polymethyl vinyl ether monoethylmaleate	15 1181,600	Polyurethane elastomers	08 13,040
Poly(mixed ethylene, propylene glycol) capped with alkyl oxides	12 763,000	Polyurethane resins	08 13,080
Polyoxin B	08 58,000	Polyvinyl acetate resins	08 47,000
Polyol aluminum chelate	15 1363,500	Polyvinyl alcohol resins	08 48,000
Poly- α -olefins	14 453,000	Polyvinyl butyral resins	08 49,000
Poly- α -olefins, sulfurized	14 454,000	Polyvinyl chloride copolymer resins, all other	08 49,020
Polyol glycidyl ether	15 1317,700	Polyvinyl chloride homopolymer resins	08 49,010
Polyoxyalkene silicones	15 1391,000	Polyvinyl formal resin	08 49,050
Polyoxyalkylated cyclic amines	14 468,000	Poly(vinylidene fluoride) resin	08 38,150
Polyoxyalkylene glycol	15 1181,800	Poly(Vinyl)-O-sulfobenzal	14 379,000
Polyoxyalkylene glycols, alkoxylated	12 762,600	Potassium acetate	15 602,000
Poly(oxy-1,2-ethanediyl), w-(2-carboxyethoxy)- ω -alkyl deriva., potassium salt	12 47,490	Potassium citrate	15 10,800
Poly(oxy-1,2-ethanediyl), w-(2-ethoxyethyl) bis-, N-tallow	12 47,500	Potassium diethyl phosphorodithioate	15 730,500
Poly(oxy-1,2-ethanediyl)- α -carboxy-methyl, omega-(tridecyloxy), potassium salt	08 457,000	Potassium 2-ethylnickanoate	15 641,000
Poly(oxy-1,2-ethanediyl), α -phenylmethyl-70-hydroxy, C ₁₂ -C ₁₈ alkyl ethers	12 763,450	Potassium gluconate	06 766,000
Poly(oxy-1,2-ethanediyl), α -phenylmethyl-70-hydroxy, ethoxylated nonphenol alkyl ether	12 763,500	Potassium glutamate	14 9,000
Poly(oxyethylanyl, 2-diy)-d-[2-bis(2-aminoethyl) methylamiumethyl]-	12 465,640	Potassium glutamate	15 1411,400
Poly(oxyethylene(dimethylamino)ethylene (dimethylamino) ethylene dichloride)	13 195,013	Potassium iodate	15 1411,800
Polyphenolic phosphites, polyalkylated	09 86,000	Potassium salicylate	15 725,000
Polyphenyl aromatic ester resins	08 34,500	Potash (all spodium salts of fatty, rosin, and tall oil acids, ad other)	06 387,000
Poly-m-phenylene isophthalamide	14 392,000	Potassium stearate	12 74,000
Polyphenylene oxide type resins	08 35,000	Potassium terephthalate	15 768,000
Polyphenylene sulfide resins	08 35,500	Potassium xanthate	15 761,500
Poly-p-phenylene terephthalamide	14 393,000	Potoloxane	06 629,000
Polypropoxy diethylmethyl ammonium chloride	12 465,650	Potoloxane hydrochloride	06 271,000
Polypropylene glycol	15 1187,480	Prasolin	06 710,000
Polypropylene glycol, alkoxylated, polymer with maleic anhydride, acrylic acid, and alkylphenol-formaldehyde resin, alkoxylated	12 764,400	Prethiolone	06 359,650
Polypropylene glycol butyl ether (Polypropoxy butyl ether)	15 1187,500	Predisilolone acetate	06 664,000
Polypropylene glycol butyl ether, ethoxylated	15 1187,503	Primary monamines, all other	06 665,000
Polypropylene glycol diester of tall oil acids	12 719,370	Probenacid	06 666,000
Polypropylene glycol dioleate	12 764,000	Probenol	12 430,000
Polypropylene glycol, ethoxylated	12 764,100	Procarbazine	06 279,000
Polypropylene glycol glycerol triether, copolymer with epichlorohydrin, bisphenol epoxy resin	12 89,000	Prochlorperazine maleate	06 486,800
Polypropylene glycol, phosphated	06 36,000	Progesterone	06 683,000
Polypropylene polymer and copolymer resins	10 20,000	1-Propamine, 3-(C-C-alkoxy derivatives)	12 413,500
Poly sulfide (T) type elastomers	08 38,100	1-Propamine, N-ethyl-N-dimethyl-3-[(1-oxoacetate)amino]-, ethyl sulfate	12 477,280
Polytetrafluoroethylene (PTFE)	08 38,100	1,2-Propanediol didecanoate	12 699,080
Polytetrafluoroethylene ethyl iodide	15 1269,000	1,2-Propanediol dipalmarate	12 699,140
		1,2-Propanediol monolaurate	12 701,000
		1,2-Propanediol mono-oleate	12 702,000
		1,2-Propanediol mono-stearate	12 703,000
		3-Propionic acid, coccoamino, sodium salt	12 31,500
		Propionin bromide	06 293,000
		P-Propionilactide (Anethole)	07 81,000
		Propionaldhyde	15 802,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Propionic acid	15	2,4-[1H,3H]Pyrimidinedione	15
Propionic anhydride	572,000	2-Aminelic diamide	15
Propionic blends	573,000	2-Aminelic diurethane	03
Propionitrile	460,500	2-Pyrrolidone	03
Propionyl chloride	450,500	2-Pyrrolidone-1-ethyl polymer with 1-icosene	15
Propiophenone	573,050	4-N-(1-Pyrrolyl)-m-toluenediazonium chloride	14
Propyl acetate	377,000	Pyridinium pamoate	03
Propylalcohol (Propanol)	1187,750	Quaternary ammonium salts having amide linkages, all other	12
Propylamine, mono	496,000	Quaternary ammonium salts, not containing oxygen, acyclic, all other	12
Propylamine, mono (Propanol)	412,000	Quaternary ammonium salts not containing oxygen, cyclic, all other	12
Propylamine, dihydroacetate (Pebrulate)	301,000	Quinidine	12
S-Propylbutylthiocarbamate	81,200	Quinoline-2,3-dicarboxylic acid	03
S-Propylbutylthiocarbamate (Pebrulate)	206,000	2-Quinolol	03
S-Propylchloroformate	1050,400	8-Quinolol, copper salt	13
S-Propyl dipropylthiocarbamate (Vernolate)	207,000	8-Quinolol, magnesium salt	13
Propylene glycol	42,000	p-Quinone	15
Propylene glycol (1,2-Propanediol)	1093,000	Quinone dioxime	03
Propylene glycol t-butyl ether	1187,357	Repressed acids (ratio=1/1)	12
Propylene glycol sebacate	115,500	Rare earths 2-ethylhexanoate	15
Propylene glycol sebacate	115,500	Rare earths naphthenate	14
Propylene glycol stearate	147,800	Rare earths neodecanoate	15
Propylene glycol stearate	1132,300	Reactive Black 5	04
Propylene glycol stearate of hydrogenated palm oil	719,500	Reactive Black 9	04
Propylene glycol ethers (and propylene glycols), all other	1187,475	Reactive Black dyes, all other	04
Propylene glycol monomethyl ether (1-Methoxy-2-propanol)	1187,400	Reactive Blue 3	04
Propylene glycol monochloroacetate	111,500	Reactive Blue 4	04
Propylene glycol sebacate	115,500	Reactive Blue 5	04
Propylene oxide	1323,000	Reactive Blue 7	04
Propyl fumarate	115,400	Reactive Blue 13	04
Propyl gallate	148,000	Reactive Blue 19	04
Propylhexedrine	344,000	Reactive Blue 21	04
n-Propyl mercaptan (1-Propanethiol)	96,000	Reactive Blue 21	04
Propyl oleate, sulfated, sodium salt	262,000	Reactive Blue 38	04
2-Propyn-1-ol (Propargyl alcohol)	869,000	Reactive Blue 41	04
Proteases (bacterial)	104,000	Reactive Blue 50	04
Proteases, all other	108,000	Reactive Blue 71	04
Protein hydrolysates	17,000	Reactive Blue 89	04
Pseudoephedrine hydrochloride	346,000	Reactive Blue 174	04
Pseudoephedrine sulfate	347,000	Reactive Blue 199	04
Pseudoionone	836,000	Reactive Blue 203	04
Pseudoionyl acetate (Neobergamate)	166,700	Reactive blue dyes, all other	04
8,16-Pyranthrene	1377,200	Reactive Brown 1	04
1,3,6,9-Pyrenetetrasulfonic acid	1382,000	Reactive Brown 17	04
Pyridine hydrochloride	1378,000	Reactive Brown 18	04
3-Pyridinemethanol	1378,000	Reactive Brown 19	04
2% Pyridine, refined	1379,000	Reactive Orange 1	04
Pyridine, refined all other grades	1380,003	Reactive Orange 4	04
2-Pyridinethiol-1-oxide, sodium salt	1385,003	Reactive Orange 12	04
2-Pyridinethiol-1-oxide, zinc salt	1385,053	Reactive Orange 13	04
3-Pyridinol	319,000	Reactive Orange 16	04
Pyridostigmine bromide	319,000	Reactive Orange 20	04
		Reactive Orange 72	04
		Reactive Orange 78	04
		Reactive Orange 84	04

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Reactive Orange 86	04 917,085	Rubber modified polystyrene	08 44,020
Reactive Red 2	04 918,000	Rubber-processing chemicals, acyclic, all other	09 187,000
Reactive Red 8	04 920,000	Rubber-processing chemicals, cyclic, all other	09 120,000
Reactive Red 11	04 924,000	Rust preventing additives	07 85,000
Reactive Red 21	04 925,000	Saccharin (1,2-Benzothiazolin-3-one, -1,1-dioxide)	14 172,000
Reactive Red 31	04 927,000	Saccharin sodium salt	07 87,000
Reactive Red 33	04 928,000	Salicylaldehyde	03 1404,000
Reactive Red 43	04 930,043	Salicylaldehyde oxime	07 161,500
Reactive Red 49	04 930,049	Salicylanilide	03 1405,502
Reactive Red 94	04 931,094	Salicylic acid	06 557,000
Reactive Red 120	04 931,120	Salicylic acid ammonium salt	15 162,200
Reactive Red 141	04 931,141	Salicylic acid magnesium salt	03 1406,000
Reactive Red 147	04 931,147	Salicylic acid, tech.	15 389,000
Reactive Red 180	04 931,180	Salts of organic acids, all other	06 781,000
Reactive Red 198	04 931,198	Sarcosine	14 16,000
Reactive Red 243	04 932,000	Sebacic acid	15 574,000
Reactive Violet 1	04 933,000	Sebacoyl chloride	06 480,000
Reactive Violet 5	04 936,033	Secobarbital	06 461,000
Reactive Violet 33	04 937,000	Secobarbital, sodium	06 467,000
Reactive violet dyes, all other	04 904,000	Secondary and tertiary monoamines, all other	12 47,000
Reactive Yellow 7	04 905,000	Semicarbazide hydrochloride	05 20,000
Reactive Yellow 15	04 906,000	Semisynthetic penicillins, all other	05 43,000
Reactive Yellow 17	04 907,000	Silicone greases	15 1392,000
Reactive Yellow 16	04 910,000	Silicone resins	14 462,000
Reactive Yellow 37	04 910,042	Silicone (Q) type elastomers	08 14,000
Reactive Yellow 42	04 910,088	Silicone (Q) type elastomers	10 21,000
Reactive Yellow 89	04 910,125	Sisomycin	08 328,500
Reactive Yellow 152	04 910,135	3-Sodiosulfobenzic acid	05 58,700
Reactive Yellow 160	04 910,160	Sodium acetate	15 162,230
Reactive yellow dyes, all other	04 911,000	Sodium aminobenzoate	05 393,000
Remin	04 928,035	Sodium ammonium polyacrylate and copolymers	14 431,000
Resorcinol	06 105,000	Sodium ascorbate	06 809,000
Resorcinol diglycidyl ether	06 172,000	Sodium benzoate	05 11,000
Resorcinol, dimethyl ether	03 151,500	Sodium n-butylxanthate	15 11,000
Resorcinol, tech.	03 1399,500	Sodium caprylate	14 142,000
β-Resorcylic acid	03 1402,000	1-(Sodium carboxyethylene)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(tall oil fatty acids)-2-imidazolium hydroxide	06 137,000
Rhodin	07 167,000	Sodium carboxymethyl amylose	12 27,100
Riboflavin (animal feed grade)	06 801,000	Sodium carboxymethylcellulose (100%)	14 432,000
Riboflavin (medical grade)	06 802,000	1-(Sodium carboxymethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(coconut oil fatty acids)-2-imidazolium lauryl sulfate	14 412,000
Ricnicoleic and acetylarabonic acid esters, all other	06 803,000	Sodium carboxymethyl starch	12 27,200
Ricnicoleic acid salts, all other	11 111,000	Sodium citrate	14 432,200
Rose oxide	15 174,000	Sodium cresylate	15 626,000
Rosin acid salts, all other	07 115,500	Sodium diacetate	01 18,050
Rosin acids potassium salt	15 160,000	Sodium di-sec-butyl diethyl phosphorodithioate	15 604,000
Rosin acids sodium salt	12 66,000	Sodium di-sec-butyl phosphorodithioate	15 731,000
Rosin acids, sodium salt	12 66,000	Sodium diethyl phosphorodithioate	15 732,000
Rosin amine, triethanolamine salt	12 32,000	Sodium diethyl phosphorodithioate	15 733,000
Rosin amine, ethoxylated	12 353,000	Sodium diisobutyl phosphorodithioate	15 734,000
Rosin amines	14 138,000	Sodium disobutyl phosphorodithioate	15 734,500
Rosin esters, unmodified (Ester gums)	06 159,000	Sodium ethylxanthate	15 735,000
Roxarsone	08 160,000	Sodium thiyoxanthate	14 144,000
Roxarsone, sodium	06 160,000		

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Chemical name	Sect. Item No.	Sect. Item No.	Chemical name	Sect. Item No.
Sodium fluoroacetate	13	232.000	Solvent Orange 60	04 987.060
Sodium formate, technical	15	655.000	Solvent Orange 67	04 987.077
Sodium gluconate	15	862.000	Solvent Orange 97	04 987.097
Sodium heparin	06	630.000	Solvent orange dyes, all other	04 988.000
Sodium lactate (Nalac)	15	674.000	Solvent Red 23	04 989.000
Sodium mercaptoacetate	15	697.000	Solvent Red 26	04 991.023
Sodium methoxide (Sodium methylete)	15	1418.000	Solvent Red 26	04 992.000
Sodium-N-methyl-N-oley (taurate)	15	743.350	Solvent Red 27	04 993.000
Sodium nitroprusside	06	359.500	Solvent Red 49	04 999.000
Sodium oleate	15	719.500	Solvent Red 49	04 1001.000
Sodium oxalate	15	726.000	Solvent Red 74	04 1003.000
Sodium polyacrylate	14	433.000	Solvent Red 74	04 1008.000
Sodium polyacrylate, grafted	15	433.000	Solvent Red 111	04 1011.000
Sodium propionate	15	738.000	Solvent Red 164	04 1012.000
Sodium salicylate	15	268.000	Solvent Red 166	04 1012.168
Sodium stearate	15	762.100	Solvent Red 168	04 1012.168
Sodium p-sulfophenylmethyl ether	03	1417.100	Solvent Red 175	04 1012.175
Sodium tetradecyl sulfate	08	837.005	Solvent Red 207	04 1012.208
Sodium trichlorobenzenesulfate	03	1410.500	Solvent Red 208	04 1012.222
Solid type polyvinylidene chloride resins	08	50.020	Solvent Red 222	04 1013.000
Solubilized Sulfur Black 2	04	111.000	Solvent red dyes, all other	04 1014.000
Solvent Black 7	04	1052.000	Solvent Violet 8	04 1015.011
Solvent Black 13	04	1053.000	Solvent Violet 11	04 1016.000
Solvent Black 28	04	1055.000	Solvent Violet 13	04 1017.000
Solvent Black 46	04	1057.046	Solvent Violet 14	04 1018.038
Solvent Black 47	04	1057.047	Solvent Violet 38	04 1019.000
Solvent Black 49	04	1057.049	Solvent violet dyes, all other	04 957.000
Solvent Blue 3	04	1020.000	Solvent Yellow 3	04 958.000
Solvent Blue 5	04	1022.000	Solvent Yellow 13	04 958.000
Solvent Blue 23	04	1028.023	Solvent Yellow 14	04 959.016
Solvent Blue 35	04	1028.035	Solvent Yellow 16	04 959.018
Solvent Blue 36	04	1029.000	Solvent Yellow 18	04 963.000
Solvent Blue 38	04	1031.000	Solvent Yellow 33	04 965.000
Solvent Blue 43	04	1032.000	Solvent Yellow 40	04 966.000
Solvent Blue 58	04	1033.000	Solvent Yellow 42	04 967.000
Solvent Blue 59	04	1034.000	Solvent Yellow 43	04 970.000
Solvent Blue 98	04	1037.000	Solvent Yellow 47	04 971.000
Solvent Blue 99	04	1037.059	Solvent Yellow 56	04 974.094
Solvent Blue 100	04	1038.000	Solvent Yellow 72	04 975.000
Solvent Blue 101	04	1038.101	Solvent Yellow 94	04 975.131
Solvent Blue 102	04	1038.102	Solvent Yellow 107	04 975.135
Solvent Blue 129	04	1038.129	Solvent Yellow 131	04 975.143
Solvent blue dyes, all other	04	1039.000	Solvent Yellow 135	04 975.160
Solvent Brown 12	04	1045.000	Solvent Yellow 143	04 975.161
Solvent Brown 20	04	1047.000	Solvent Yellow 160	04 975.167
Solvent Brown 22	04	1048.000	Solvent Yellow 161	04 976.000
Solvent Brown 52	04	1049.052	Solvent Yellow 167	04 976.000
Solvent Green 3	04	1042.000	Solvent yellow dyes, all other	15 576.000
Solvent Orange 2	04	977.000	Sorbic acid (2,4-Hexadienoic acid)	15 1084.000
Solvent Orange 3	04	978.000	Sorbitol (70% by Weight)	15 1189.000
Solvent Orange 7	04	980.000	Sorbitol, alkoxyated	15 1189.000
Solvent Orange 20	04	981.000	Sorbitol, monostearate	15 1190.300
Solvent Orange 23	04	982.000	Sorbitol, propoxylated	15 1190.300
Solvent Orange 25	04	984.000	Soya fatty acids, reaction products with chloromethane	15 1190.300
Solvent Orange 31	04	985.000		

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. item No.	Chemical name	Sect. item No.
and diethylenetriamine, ethoxylated, quaternized	12	Stearoyl chloride	15
Soya fatty acids, reaction products with chloromethane	12	Stearoyl iso-lactylate, sodium salt	15
and diethylenetriamine, propoxylated, quaternized	12	Stearoyl lactylate, mixed sodium and calcium salt	12
Soybean oil acids (Ratio=2/1)	541,500	Stearoyl lactylate, sodium salt	12
Soybean oil acids (Ratio=1/1)	549,300	Stearoyl lactylate, sodium salt	12
(Soybean oil alkyl)amine	427,000	Stearoyl acid phosphate	15
N-(Soybean oil alkyl)trimethylenediamine	435,000	Stearoyl alcohol, propoxylated	12
N-(Soybean oil alkyl)trimethylenediamine	414,000	Stearoyl alcohol, propoxylated	12
Soybean oil, sulfated, sodium salt	312,000	Stearylamidopropyl dimethylamine	12
Specific gravity 0.940 and below	31,100	Stearylamidopropyl dimethylamine lactate	12
Specific gravity over 0.940	31,400	Stearylamidopropyl dimethyl myristyl acetate ammonium chloride	15
Specific gravity over 0.940	32,000	Stearylmyristamide	12
Spectinomycin (animal feed grade)	65,000	Stearyl methacrylate	15
Spectinomycin (medical grade)	57,000	Stearyl pyridium chloride	15
Sperm oil alcohol, ethoxylated	739,000	Stearyl stearamide	12
SprfO[3H-1,2-benzoxathiole-3,9'-[9H]-xanthene]-3,6'-diol-1,1'-dioxide	1410,600	Stearyl stearate	15
Sprnolactone	740,500	Straight polystyrene	06
Stannous dioctyl phthalate (Dioctyl tin phthalate)	164,300	Strepitococin	06
Stannous 2-ethylhexanoate	643,000	Strontium stearate	15
Stanzolol	641,600	Styrenated-alkyls, or copolymer alkyls	08
Stearamide (Octadecane amide)	233,000	Styrene (Vinylbenzene)	03
Stearamideethyldiethanolamine	388,900	Styrene- <i>n</i> -butadiene copolymer resins (SAN)	08
Stearamideethylethanolamine acetate	388,950	Styrene-allyl alcohol copolymer resins	08
Stearamideethyl-2-heptadecyl imidazole	414,300	Styrene-butadiene latex type	10
Stearamidopropyl dimethylacetylarmonium tosylate and propylene glycol	477,300	Styrene-butadiene latex type	10
Stearic acid (Ratio = 2/1)	543,000	Styrene-butadiene type elastomers, other	10
Stearic acid (Ratio = 1/1)	565,000	Styrene-butadiene-vinylpyridine	10
Stearic acid (Ratio = 2/1)	562,000	Styrene-butadiene-vinylpyridine	10
Stearic acid (Ratio = 1/1)	550,000	Styrene copolymers, all other	08
Stearic acid aminoethanolamine (amine acid ratio = 1,0/1.05)	575,450	Styrene-divinylbenzene copolymer resins	08
Stearic acid, ammonium ethyl ethanolamine condensate	581,200	Styrene latexes, all other	08
Stearic acid, ammonium salt	67,990	Styrene-maleic anhydride copolymer resins	08
Stearic acid, diethanolamine condensate, methyl sulfate	389,500	Styrene-methyl methacrylate copolymer resins	08
Stearic acid-diethylenetriamine condensate	367,000	Styrene oxide	15
Stearic acid-diethylenetriamine condensate, ethyl sulfate	367,500	Styrene type plastics materials, all other	08
Stearic acid, N,N-dimethylamino-propylamine condensate	369,600	Succinylcholine chloride	06
Stearic acid esters, all other	125,000	Succinyl peroxide	06
Stearic acid ethylenediamine condensate	368,290	Sucralfate	06
Stearic acid-ethylenediamine condensate amine/acid ratio=1/2	588,000	Sucrose acetate isobutyrate	11
Stearic acid-ethylenediamine condensate, monoethoxylated	382,000	Sucrose benzoate	15
Stearic acid ethylene diamine methyl ammonium sulfate	501,500	Sucrose octa-acetate	15
Stearic acid mixed amine condensate	369,500	Sulfacetamide	06
Stearic acid monoethanolamine condensate	581,500	Sulfacetamide, sodium	06
Stearic acid, potassium salt	68,000	Sulfadiazine, silver	06
Stearic acid, sodium salt	69,000	Sulfadimethoxine	06
Stearic acid, tetraethylenepentamine condensate	370,000	Sulfamethazine	06
Stearic acid, N,N,N',N'-tetraakis(2-hydroxyethyl)-ethylenediamine salt	33,000	Sulfamethazole	06
Stearic acid, triethanolamine salt	34,000	Sulfamethoxazole	06
N-Stearoyl-p-aminophenol	104,000	Sulfanilic acid (p-Aminobenzenesulfonic acid) and salt	03
		Sulfasalazine	06
		Sulfated cyclic ethers, all other	12

Table D-1—Continued
Alphabetical Chemical Index

Chemical name	Sect. Item No.	Sect. Item No.
Sulfated esters, all other	12	269,000
Sulfated ethers, all other	12	283,000
Sulfathiazole, sodium	06	234,000
Sulfisoxazole	06	235,000
Sulfisoxazole, acetyl	06	217,000
5-Sulfisophtalic acid, 1,3-dimethyl ester	03	147,300
5-Sulfisophtalic acid, 1,3-dimethyl ester, sodium salt	03	147,300
5-Sulfisophtalic acid, lithium salt	03	147,500
5-Sulfisophtalic acid, sodium salt	03	1190,400
Sulfone diglycol	12	215,000
Sulfonic acids, all other	12	189,000
Sulfonic acids having amide linkages, all other	12	209,000
Sulfonic acids with ether linkages, all other	12	209,000
4-Sulfophtalic acid	03	1421,000
Sulfosuccinic acid, bis(2,6-dimethyl-4-heptyl)ester, sodium salt	12	190,000
Sulfosuccinic acid, bis(2-ethylhexyl) ester, sodium salt	12	191,000
Sulfosuccinic acid, didecyl ester, sodium salt	12	192,000
Sulfosuccinic acid, dibutyl ester, sodium salt	12	194,000
Sulfosuccinic acid, dibutyl ester, sodium salt	12	194,210
Sulfosuccinic acid, dibutyl ester, sodium salt	12	194,220
Sulfosuccinic acid, dicyclopentyl ester, sodium salt	12	194,300
Sulfosuccinic acid, didecyl ester, sodium salt	12	195,000
Sulfosuccinic acid, dodecyl ester, sodium salt	12	196,000
Sulfosuccinic acid, lauryl polyethylene glycol ether ester, disodium salt	12	196,450
Sulfosuccinic acid esters, all other	12	197,000
Sulfosuccinic acid (coconut oil alkyl)iminopropanol half-ester, sodium salt	12	193,400
Sulfosuccinic acid, monolaurate ester, disodium salt	12	196,485
Sulfosuccinic acid, myristyl ester, disodium salt	12	196,570
monomethanalamine salt	12	196,580
Sulfosuccinic acid, nonoxynyl-10 ester, disodium salt	12	196,570
Sulfosuccinic acid, oleamidopolyethyleneglycol, disodium salt	12	196,600
Sulfosuccinic acid, oleinoleamide monoethanalamine, disodium salt	12	196,800
Sulfosuccinic acid, sodium	06	149,000
Sulfur Black 1	04	1106,000
Sulfur Black 11, 11:1	04	1114,000
Sulfur brown dyes, all other	04	1105,000
Sulfur compounds, all other	14	264,000
Sulfuric acid esters, all other	12	317,000
Sulfurized corn oil	15	1330,050
Sulfurized sperm oil substitutes	14	202,000
Sulfur orange dyes, all other	04	1067,000
Sulfur Red 10	04	1070,000
Sulfur yellow dyes, all other	04	1065,000
Sulindac	06	414,500
Sympathomimetic (adrenergic) agents, all other	05	349,000
Synthetic fatty alcohol ester, sulfated, sodium salt	12	302,500
Synthetic sweetener material, all other	07	88,000
Tacrine	06	837,007
Tall oil acids (Ratio = 2/1)	12	543,000
Tall oil acids, <i>trans</i> -thiopyperazine condensate	12	551,000
Tall oil acids, diethanalamine salt (Condensate)	12	370,900
Tall oil acids, diethylene/thiamine condensate	12	34,300
Tall oil acids, dimethylamine condensate (Amine acid Ratio 1/1)	12	371,000
Tall oil acids, ethoxylated	12	587,500
Tall oil acids, ethoxylated and propoxylated	12	672,400
Tall oil acids, exbottom ester, sulfated, sodium salt	12	672,420
Tall oil acids, polyalkylene/polyamine condensate	12	268,650
Tall oil acids, polyalkylene polyamine condensate, salts, with dodecylbenzene sulfonic acid and/or tall oil fatty acids	12	372,000
Tall oil acids, potassium salt	12	372,010
Tall oil acids, sodium salt	12	70,000
Tall oil acids, sulfated, sodium salt	12	71,000
Tall oil acids, triethanalamine salt	12	268,700
Tall oil acyl chloride	15	34,360
3-(Tall oil amino)propyl amine	15	147,600
Tall oil, chemically modified	15	168,000
Tall oil fatty acids (Ratio = 1/2)	12	555,300
Tall oil fatty acids (Ratio = 2, 7/1)	12	555,310
Tall oil fatty acids (ratio = 1, 5/1)	12	555,305
Tall oil fatty acids, polymerized	15	167,600
Tall oil fatty acids, triethanalamine condensate	12	575,600
(Tall oil fatty acids), triethanalamine salt	12	34,370
Tall oil monomer	15	168,050
Tall oil: Pentaerythritol talate	15	168,100
Tall oil, refined, ethoxylated	12	672,500
Tall oil salts, all other (Unoleic-rosin acid salts)	15	179,000
Tall oil sulfated, ammonia salt	12	312,50*
Tall oil, sulfated, sodium salt	12	312,700
Tallow acids (Ratio = 2/1)	12	544,000
Tallow acids	12	562,000
Tallow acids (amine/acid ratio=1.00/1.65)	12	567,450
Tallow acids, potassium salt	12	72,000
Tallow acids, sodium salt	12	73,000
Tallow acids, triethanalamine salt	12	34,500
Tallow alcohol, ethoxylated	12	740,000
(Tallow alkyl)amine	12	429,000
(Tallow alkyl)amine acetate	12	399,000
(Tallow alkyl)amine, ethoxylated	12	336,000
(Tallow alkyl)amine, ethoxylated, diethosulfate	12	465,940
(Tallow alkyl)amine, propoxylated	12	336,040
N-(Tallow alkyl)dipropylamine	12	415,000
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	12	18,000
N-(Tallow alkyl)trimethylenediamine	12	416,000
N-(Tallow alkyl)trimethylenediamine acetate	12	400,000
N-(Tallow alkyl)trimethylenediamine, ethoxylated	12	337,000
Tallow amide, hydrogenated	15	255,000
Tallow amine, ammonium salt	12	477,700
Tallow, n-3-(dimethylamino)propyl (amine/acid ratio=1/3)	12	587,600
(Tallow ethyl alkyl)amine, ethoxylated, sulfate	12	336,020
Tallow fatty acids- <i>trans</i> -thiopyperazine condensates	12	373,550

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Tallow fatty acids, ethoxylated	12 672-600	Tetrahydro-3,5-dimethyl-2H-1,3,5-thiazine-2-thione (DMTT)	13 12,000
Tallow nitrile	15 453,000	Tetrahydrofuran	03 1438,000
Tallow, sulfur	12 295,000	Tetrahydrofurfuryl alcohol	03 83,000
Tannic acid, NF	15 180,000	Tetrahydrofurfuryl oleate	15 53,000
Tar bases: terials, synthetic, all other	14 471,000	Tetrahydroisopropanol	07 169,170
Tar bases: crude bases (Dry bases)	01 10,000	1,2,3,4-Tetrahydronaphthalene (TetraIn)	15 186,000
Tar distillates, all other	01 22,000	1,2,3,4-Tetrahydronaphthalene	15 186,000
Tar for other uses: crude	01 24,000	Tetrahydropyrimidine from tall oil fatty acids and propylenediamine	03 1438,253
Tar for other uses: refined	01 25,000	2,2',3,3'-Tetrahydro-3,3',3''-tetramethyl-1,1'-spiro[11H-indene]-5,5',6,6'-tetrol	14 174,000
Terp acetate	07 169,000	Tetrahydrothiophene	03 1439,500
Terazosin	06 359,900	Tetrahydrothiophene-1,1-dioxide (Sulfolane)	15 187,000
Terbutaline sulfate	06 347,500	2,2',4,4'-Tetrahydrozincophenone	15 497,000
Terphenhalic acid	03 1422,000	Tetrahydrozoline hydrochloride	06 348,000
Terphenhalic acid, dimethyl ester	03 1424,000	Tetra-isopropoxy titanium (bis dicycyl) phosphite	12 784,550
Terphenhalic chloride	03 1424,500	Tetraisopropyl titanate	15 1061,000
Terpene hydrocarbons, monocyclic (Solvenol)	15 182,000	Tetrakis(2-chloroisopropyl)ethylene diphosphate	15 1035,500
Terphenyl (Phenylphenyl) (m-, o-, and p-isomers)	03 1426,000	Tetrakis(2-ethylhexyl) titanate	15 1035,550
Terpineol	07 116,500	N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	15 1062,000
α -Terpineol	07 117,000	N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine, propoxylated	12 338,100
α -Terphenyl acetate	07 120,000	N,N,N',N'-Tetrakis(2-hydroxypropyl) ethylene diamine	12 337,590
α -Terphenyl propionate	07 121,000	N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylenediamine, propoxylated and ethoxylated	12 339,000
1-Tert-butyl-2,5-dimethoxybenzene	03 377,500	1,1,3,3-Tetramethoxypropane	15 188,500
Tertiary amyl per-2-ethylhexanoate	15 1263,200	1,2,4,5-Tetramethylbenzene (Durene)	15 1324,000
Tetosteroles	06 641,800	N,N,N',N'-Tetramethyl-1,3-butanediol	15 477,000
Tetosterones cyclonate	08 642,300	N,N,N',N'-Tetramethyl-1,3-butanediol	15 304,000
Tetosterones propionate	08 642,300	p-(1,1,3,3-Tetramethylbutyl)phenol	03 1443,000
Tetraammonium phosphate	15 184,000	2,4,7,9-Tetramethyl-5-decane-4,7-diol, ethoxylated	12 768,000
Tetraamorphous anhydride	03 1429,000	Tetramethylmethylenediamine	15 305,000
Tetraaryl titanate	13 31,200	Tetramethylammonium chloride	15 188,500
2,4,5,6-Tetrachloroisophthalonitrile	03 1429,000	Tetramethylammonium chloride	15 1324,000
Tetrachlorophthalic anhydride	13 31,200	N,N,N',N'-Tetramethylbenzene (Durene)	15 477,000
Tetrachlorophthalic anhydride	03 1435,600	N,N,N',N'-Tetramethyl-1,3-butanediol	15 304,000
Tetracycline	06 379,000	p-(1,1,3,3-Tetramethylbutyl)phenol	03 1443,000
1-Tetradecane (Myristyl alcohol)	15 185,500	2,4,7,9-Tetramethyl-5-decane-4,7-diol, ethoxylated	12 768,000
2-Tetradecyldicyclohexyl aniline	15 185,500	Tetramethylmethylenediamine	15 305,000
Tetra-(2,2-dialkylloxymethylene)-1-butoxy titanium bis-(dihexyl) phosphite	12 784,500	Tetramethylmethylenediamine	15 305,000
Tetraethyl ammonium bromide	15 474,500	Tetramethyl, octahydro acetylphenone	07 88,800
Tetraethylene glycol	15 1191,000	Tetramethyl, octahydro acetyl naphthalene	07 88,810
Tetraethylene glycol di(2-ethylhexanoate)	11 126,100	3,3',4,4'-Tetramethylphenol ether	03 1443,200
Tetraethylenepentamine	15 303,000	Tetra octyloxy titanium (bis-tridecyl phosphite)	12 784,100
Tetraethyl lead	14 185,000	Tetra/penta glycols, mixed	15 192,000
O,O',O''-Tetraethyl S,S'-methylene bisphosphorodithioate (Ethion)	13 227,000	Textile chemicals, other than surface active agents, all other	14 507,000
Tetraethyl orthosilicate (Tetraethyl silicate)	15 1054,000	Theobaine	06 435,000
1,2,2,2-Tetrafluoroethane	15 1269,800	Thermoplastic resins, benzenoid, all other	08 52,000
Tetrafluoroethylene (F-1114)	15 1270,000	Thermosetting acrylate resins	08 20,030
Tetrafluoromethane (F-14)	15 1271,000	Thermosetting resins, benzenoid, all other	08 18,000
Tetrahydro ammonium bromide	12 501,635	Thermosetting resins, nonbenzenoid, all other	08 18,000
Tetrahydro- α -chlorimerol(50/50 mixture of tetrahydro-linalool and tetrahydro-mircenol)	07 169,140	Thermoplastic elastomers (such as styrene-butadiene copolymers, thermoplastic olefin elastomers, thermoplastic polyurethanes elastomers, and copolyester)	10 5,000
Tetrahydroalcochmethyl hydrochloride [Tetrahydro-dimethyltriene hydrochloride	15 1244,400	Thiazobazole	06 132,000
Tetrahydro-3,5-dimethyl-1-[2-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]ethyl]-2-propenyldiene]hydrozone	13 166,028	1,3,4-Thiadiazole, 2,5-bis (dialkylthio) derivatives	04 290,000
		Thiazole mononitrate	08 805,000
		Thiarylat, sodium	08 463,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Thiazole derivatives, cyclic, other	09	p-Toluenesulfonamide	03
Thioacetic acid, potassium salt	15	p-Toluenesulfonamide o-, p-mixtures	11
4, 4'-Thiobis (6-tert-butyl-0-cresol)	15	p-Toluenesulfonamide/diphenylamine	09
N, N'-Thiobis (methylthio) carbonyloxy bis ethanamide	13	p-Toluenesulfonic acid	03
Thiocarbamide (Diphenylthiourea)	14	p-Toluenesulfonic acid, aniline salt	03
Thioctic acid, methylene ester	13	p-Toluenesulfonic acid, potassium salt	12
2-(Thiocyanomethylthio) benzothiazole	13	p-Toluenesulfonic acid, sodium salt	12
2, 2'-Thiodiethanol (Thioglycol)	15	p-Toluenesulfonyl chloride	03
Thiodiethylene bis(3,5-di-tert-butyl-4-hydroxyhydrochinamate)	15	p-Toluenesulfonyl hydrazide	09
Thiodiphenol	15	p-Toluenesulfonyl isocyanate	09
O, O'-(Thiodi-4,1-phenylene) bis (o, o-dimethyl phosphorothioate (Templos))	03	p-Toluenesulfonyl semicarbazide	09
3,3'-Thiodipropionic acid	13	Toluene xylene sulfonic acid	12
3,3'-Thiodipropionitrile	15	m-Toluc acid, methyl ester	03
Thiodisuccinic acid	15	o-Toluidine	03
Thioethanol, sodium salt	15	m-Toluidine	03
Thiohexanol, sodium salt	15	m-Toluidine, ethoxylated	12
Thiophene (Tetrahydrothiophene)	06	m-Toluidinomethanesulfonic acid	12
Thiophene	02	p-Tolylacetalddehyde	07
Thiophene	15	p-Tolyl acetate	07
Thiosemicarbazide	03	2, 2'-(m-Tolylimino) diethanol	03
Thiostrepton	15	p-Tolyl isobutyrate	07
Thiothixene hydrochloride	06	p-Tolyl octanoate	07
Thiourae resins	06	p-Tolylphenylacetate	07
Thyroglobulin	08	Tolytriazole	03
Ticarcillin, disodium	06	Tolytriazole, potassium salt	15
Timolol maleate	08	Tretinoin (vitamin A acid)	06
Tin carboxylate	15	Trialkyl phosphite	15
Tin laurate	15	Triallylamine	15
Titanic acid esters, all other	15	Triaminolone	06
Titanium acetylacetonate	15	Triaminolone acetate	06
N-2 (Ca, to C ₁₇) alkylamido-N-carboxyethyl, N-2-hydroxyethyl, 3-amino-2-methoxypropyl phosphate, disodium salt	12	Triaminolone diacetate	06
Tobramycin	06	Triamterene	09
Tocainide	06	Triaryl phosphites	09
d-α Tocopherol	06	1,3,5-Triazine-(1,3,5I2H,4H,6H)-trithianol	15
d-α Tocopherol	06	Tri(benzyloxyethyl)trimethoxymethylamine	14
d-α Tocopheryl acetate	06	N, N, N-Tribenzylamine	03
d-α Tocopheryl acetate (animal feed grade)	06	ar-Tribromoethyl benzene	03
d-α Tocopheryl acid succinate	06	2,4,6-Tribromophenol	03
Tolazamide	06	3,4',5-Tribromosalicylanilide	03
Tolbutamide	06	Tri(2-butoxyethyl) phosphate	11
P-Tolualdhyde	07	Tributyl acetylacrylate	11
Toluene-2,3-(and 3,4)-diamine (35/65 Mixture)	03	Tri-n-butylaluminum	15
Toluene-2,3-(and 4-m-Tolylenediamine)	03	Tri-n-butylamine	15
Toluene-2,4-(and 2,6)-diamine (80/20 Mixture)	03	Tributyl citrate	12
Toluene-3,4-diamine	03	2,4,6-tri-tert-Butylphenol	03
Toluene 2,4-and 2,6-dicyanate (80/20 Mixture)	03	Tributyl phosphate	14
Toluene (Toluol) other grades	01	Tributyl phosphate	14
Toluene High purity (98-100%)	02	S, S, S-Tributyl phosphorothioate	13
Toluene Other	02	Tributyl phosphorothioate (Merphos)	13
		Tributyltin chloride	12
		Trichloro oil alkylphosphate	06
		Trichloromethazine	06
		Trichloroacetotrile	15
			455.400

Table D-1—Continued
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Chemical name	Sect. No.	Item No.	Chemical name	Sect. No.	Item No.
1,2,3-(and 1,2,4)-Trichorobenzene	03	1490,000	Triethanolamine salsylate	12	340,100
1,2,4-Trichorobenzene	03	1491,000	Triethanolamine, sulfuric & phosphoric acid salts	15	482,200
1,1-Trichloro-2-bis(p-methoxyphenyl)ethane	13	146,000	Triethanolamine titanate	15	1062,500
(Methoxychlor)	13	146,000	Triethyl acetylacrylate	11	71,300
3,4,4'-Trichloroanilide	15	203,000	Triethylaluminum	15	1364,000
1,1-Trichloroethane (Methyl chloroform)	15	1245,000	Triethylamine	15	279,000
1,1,2-Trichloroethane (Vinyl trichloride)	15	1246,000	Triethylamine, nitric acid salt	15	482,300
Trichloroethylene	15	1247,000	Triethylborane	15	1368,800
Trichlorofluoromethane (F-11)	15	1272,000	Triethyl borate	15	1368,804
Trichloromelamine	15	203,500	Triethyl citrate	11	71,400
Trichloromethylsilane	15	1394,000	Triethylenediamine	15	305,600
3-Trichloromethyl-1,2,4-triazolone	03	1492,500	Triethylene glycol	15	1194,000
N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide (Caplan)	13	34,000	Triethylene glycol di(caprylate-caprate)	11	127,000
N-Trichloromethylthiothalamide (Folpet)	13	35,000	Triethylene glycol di(2-ethylbutyrate)	11	128,000
1,2,4-Trichloro-5-nitrobenzene	03	1493,000	Triethylene glycol di(2-ethylhexanoate)	11	129,000
Trichloronitromethane (Chloropirn)	13	242,000	Triethylenetetramine	15	306,000
Trichlorophenylsilane	03	1494,000	Tri(2-ethylhexyl) trimellitate	11	54,750
1,2,3-Trichloropropane	15	1248,000	Triethyl orthoacetate	15	1064,000
Trichloropropylsilane	15	1395,000	Triethyl orthoformate	15	1065,000
3,5,9-Trichloro-2-pyridinyloxyacetic acid	13	118,064	Triethyl orthophosphate	15	1066,000
α,α,α -Trichlorotoluene (Benzotrchloride)	03	1495,000	Triethyl phosphate	11	103,000
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	03	1499,000	Triethyltrimethylenetriamine	09	7,000
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)	15	204,000	Trifluoroacetic acid	15	584,009
Trichlorotrifluoroethane (F-113)	15	1273,000	Trifluoroacetic anhydride	15	584,010
Trichlorovinylsilane	15	1398,000	Trifluoroacetyl chloride	15	584,015
Trichlorovinylphosphate	11	14,000	α,α,α -Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (Trifluralin)	13	116,000
Tricresyl phosphate	15	880,000	α,α,α -Trifluoro-2,6-dinitro-N-ethyl-N-(2-methyl-2-propenyl)-p-toluidine (Ethylfluralin)	13	116,100
Tridecanol	12	90,010	Trifluoroethanol	15	1420,300
Tridecyl alcohol, ethoxylated and phosphated, polyalkylene polyamine salt	12	769,000	Trifluoroethyl methacrylate	15	1066,130
Tridecyl alcohol, ethoxylated	12	90,000	Trifluoropropene	15	1273,550
Tridecyl alcohol, ethoxylated and carbonated, sodium salt	12	319,000	Tri-n-hexyl aluminum	15	1364,900
Tridecyl alcohol, ethoxylated and phosphated, potassium salt	12	90,000	Tri-n-hexyltrimellitate	11	54,850
Tridecyl alcohol, ethoxylated and phosphated, potassium salt	12	90,030	Tri(hydrogenated tallow) amine	12	446,050
Tridecyl alcohol, ethoxylated and sulfated, sodium salt	12	272,000	Trihydrogenated tallow ammonium chloride	12	501,800
Tridecyl alcohol, propoxylated and ethoxylated	12	90,000	Triisobutylaluminum	15	1365,000
Tridecylbenzenesulfonic acid	12	136,100	Triisobutylene polyurethane	14	263,000
Tridecylbenzenesulfonic acid, sodium salt	12	138,200	Triisobutylene polyurethane	12	444,300
Tridecylglycol (ethyleneoxy) acetic acid, sodium salt	12	50,000	Triisocyanophosphate	15	1040,500
Tridecylglycol (ethyleneoxy) propionic acid, potassium salt	12	18,500	Triisocyanyl trimellitate	11	54,900
3-(3-Tridecylglycol)propylammonium propyl amine	12	339,600	Triisocyanyl trimellitate	11	54,950
Tridecyl phosphinate	12	110,300	Triisooctyl trimellitate	11	55,000
Tridecyl stearate	11	980,000	Triisopropylamine	15	409,000
Tridecyl sulfate, sodium salt	12	124,800	1,3,5-Trisopropyl benzene	15	204,800
Tri(dimethylammoniumethyl)phenol	03	204,500	Triisopropyl phosphate	12	1042,000
Tri(4-tert-butylphenyl) phosphite	15	444,000	Triisulfolane	11	444,600
Tridecylamine	12	381,000	Trimellitic acid esters, all other	11	57,000
Triethanolamine	15	279,000	Trimellitic anhydride, acid chloride	03	1509,100
Triethanolamine, ethoxylated	15	340,000	Trimellitic trichloride	03	1509,300
Triethanolamine hydrochloride	15	482,150	Trimer dibasic acids	15	584,100
Triethanolamine phosphate ester	12	340,050	Trimethylolpropanetriamine	06	275,000
			Trimethylolpropanetriamine	15	1369,000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. Item No.	Chemical name	Sect. Item No.
Vat Blue 19	04 1172.019	Violet 5:1	05 220.000
Vat Blue 20, 14%	04 1173.000	Violet 27	05 93.227
Vat Blue 29	04 1173.029	Vitamin A, all other	06 776.000
Vat Blue 43	04 1175.000	Vitamin C, all other	06 810.000
Vat Blue 66	04 1175.066	Vitamin A acetate (medical grade)	06 772.000
Vat Brown 1, 11%	04 1187.000	Vitamin A alcohol	06 773.000
Vat Brown 11, 12%	04 1190.000	Vitamin A palmitate (medical grade)	06 775.000
Vat Brown 13, 17%	04 1200.000	Waxes and paraffinic products	06 632.000
Vat Brown 57, 12.8%	04 1200.000	Wool wax alcohols, ethoxylated	09 178.800
Vat brown dyes, all other	04 1201.000	Xanthan gum	12 740.500
Vat Green 1, 6%	04 1178.000	Xanthates and sulfides, acyclic, other	04 451.000
Vat Green 3, 10%	04 1180.000	Xanthates and sulfides, cyclic, other	09 155.000
Vat Green 7	04 1180.007	o-Xylene (90-100% of o-xylene isomer)	03 1540.000
Vat green dyes, all other	04 1188.000	m-Xylene (90-100% of m-xylene isomer)	03 1539.000
Vat Orange 1, 20%	04 1129.000	p-Xylene (90-100% of p-xylene isomer)	03 1541.000
Vat Orange 2, 12%	04 1131.000	Xylene High purity (98-100%)	02 30.500
Vat Orange 7, 11%	04 1138.000	Xylene Other	03 152.800
Vat Orange 9, 12%	04 1137.000	2,4-Xylenesulfonic acid	03 152.800
Vat Red 1, 13%	04 1142.000	Xylenesulfonic acid, ammonium salt	03 1543.502
Vat Red 10, 18%	04 1144.000	Xylenesulfonic acid, mixed isomers	02 150.000
Vat Red 13, 11%	04 1146.000	Xylenesulfonic acid, sodium salt	03 1544.200
Vat Red 15, 10%	04 1148.000	2-Xylenol	03 1544.200
Vat red dyes, all other	04 1154.000	3-Xylenol	03 1544.503
Vat Violet 1, 11%	04 1155.000	3,5-Xylenol	03 1544.503
Vat Violet 13, 6-1/4%	04 1139.000	Xylenol crystals	03 1544.000
Vat Yellow 2, 8-1/2%	04 1118.000	Xylenol, low boiling point	03 1545.000
Vat Yellow 33, 15%	04 1127.000	Xylenol, not classified as to boiling point	03 1547.000
Vegetable glycerides, hydrogenated	15 330.400	Xylidine, original mixture	03 1550.000
Vegetable oils, sulfated, all other	02 313.000	Xylidine	03 1553.000
Veratraldehyde (3,4-Dimethoxybenzaldehyde)	03 323.000	Xylose (intestinal malabsorption test)	06 581.500
Very high molecular weight (>1000) hydrocarbons	04 292.000	4-(2,4-Xylazo)-2,5-xylidine	03 1553.000
Vetivonal	07 124.000	Zeranol	06 643.000
Vetivynyl acetate	07 124.000	Zinc acetate	05 606.000
Vinblastine sulfate	06 283.000	Zinc t- α -alkylcarboxylate	15 671.950
Vincristine sulfate	06 283.000	Zinc bis(monothiolanamine)dichloride	15 483.390
Vinyl acetate-acrylate copolymers	06 283.000	Zinc dialkylthiophosphate	14 235.000
Vinyl acetate, monomer	05 1069.000	Zinc dialkylphenol dithiophosphate	14 236.000
Vinyl bromide (Bromothylene)	05 1069.000	Zinc dibutyl phosphorodithioate	14 239.000
Vinyl chloride-acetate copolymer resins	06 1215.000	Zinc 2-ethylhexanoate	15 644.000
Vinyl chloride, monomer (Chloroethylene)	05 1250.000	Zinc gluceptate	06 767.000
Vinyl fluoride, monomer	15 1274.000	Zinc gluconate	06 767.300
Vinylidene chloride, monomer (1,1-Dichloroethylene)	15 1275.000	Zinc gluconate	06 742.000
Vinylidene fluoride, monomer	03 1535.000	Zinc isopropyl (Activator, physical property improver, and processing auxiliary)	14 242.000
4-Vinylpyridine	03 1536.000	Zinc laurate	09 154.800
1-Vinyl-2-pyrrolidone—other copolymers	15 216.000	Zinc naphthenate	09 179.000
1-Vinyl-2-pyrrolidone, copolymers with vinyl acetate	14 450.500	Zinc neodecanoate	14 315.000
1-Vinyl-2-pyrrolidone, methylacrylic acid, dimethylamine ethyl ester copolymer	15 214.000	Zinc phenolulfonate	05 560.000
1-Vinyl-2-pyrrolidone, polymers	14 450.000	Zinc salicylate	06 560.500
1-Vinyl-2-pyrrolidone—vinyl acetate copolymer	15 215.000	Zinc stearate	15 763.000
Vinyl toluene, all other	08 51.000	Zinc tellurate	15 178.000
Vinyl triethoxysilane	15 1398.000	Zinc undecylenate	06 140.000
Vinyl trimethoxy silane	15 1398.300	Zircosulfamate compounds	15 1409.400
		Zirconium acetate	15 607.000
		Zirconium t- α -alkylcarboxylate	15 671.975
		Zirconium 2-ethylhexanoate	15 645.000
		Zirconium neodecanoate	15 711.000



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ITC PUBLISHES 73D ANNUAL REPORT ON SYNTHETIC ORGANIC CHEMICALS

The combined production of all synthetic organic chemicals and primary products from petroleum and natural gas in 1989 was 173.0 billion kilograms, according to the ITC. That amount is 1.6 percent less than the output in 1988.

Sales of these materials in 1989, which totaled 98.4 billion kilograms valued at \$96.1 billion, were 0.2 percent more than in 1988 in terms of quantity and 2.9 percent more in terms of value. These figures include data measured at several successive steps in the manufacturing process and, therefore, they necessarily reflect some duplication.

The report, which is the 73d in an annual series, covers about 6,000 individual chemicals and chemical products and presents statistics in as great detail as possible without revealing the operations of individual producers. The report was prepared from data supplied by 698 primary manufacturers and includes a list of manufacturers of each item for which production and/or sales was reported.

The method for ordering the report this year is different from the past. This year you must order the report directly from the ITC rather than from the Government Printing Office, and there will be no charge for the report. Copies of the report Synthetic Organic Chemicals, United States Production and Sales, 1989 (USITC Publication 2338, December 1990) may be obtained by calling 202-252-1809 or from the Office of the Secretary, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436. Requests may also be faxed to 202-252-2186.

