UNITED STATES INTERNATIONAL TRADE COMMISSION

SYNTHETIC ORGANIC CHEMICALS

United States Production and Sales, 1976

USITC Publication 833

RECENT REPORTS OF THE UNITED STATES INTERNATIONAL TRADE COMMISSION ON SYNTHETIC ORGANIC CHEMICALS

*Synthetic Organic Chemicals, United States Production and Sales, 1971 (TC Publication 614, 1973), $2.70

Synthetic Organic Chemicals, United States Production and Sales, 1972 (TC Publication 681, 1974), $2.70

*Synthetic Organic Chemicals, United States Production and Sales, 1973 (ITC Publication 728, 1975), $3.25

Synthetic Organic Chemicals, United States Production and Sales, 1974 (USITC Publication 776, 1976), $3.20

Synthetic Organic Chemicals, United States Production and Sales, 1975 (USITC Publication 804, 1977), $3.10

NOTE.—The reports preceded by an asterisk (*) are out of print. The other reports listed above may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. All U.S. International Trade Commission reports reproduced by the Government Printing Office may be consulted in the official depository libraries throughout the United States.

UNITED STATES INTERNATIONAL TRADE COMMISSION

SYNTHETIC ORGANIC CHEMICALS

United States Production and Sales, 1976

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1977

USITC Publication 833

UNITED STATES INTERNATIONAL TRADE COMMISSION

COMMISSIONERS

DANIEL MINCHEW
Chairman

JOSEPH O. PARKER
Vice Chairman

GEORGE M. MOORE

CATHERINE BEDELL

ITALO H. ABLONDI

KENNETH R. MASON
Secretary to the Commission

OFFICE OF INDUSTRIES

This report was prepared principally by Roger Adams, David B. Beck, Tedford C. Briggs, Edmund Cappuccilli, Louis N. DeToro, John J. Gersic, Anne Klein, J. Ross Lewis, Thomas O'Connell, and K. James O'Connor, Jr.

Assistance in the preparation of this report was provided by Mildred Higgs, Frances Battle, Sharon Greenfield, Linda Hoover, Ralph Gray, Kenneth Kozel, and Charlotte Alderman. Automatic Data Processing input was provided by Patricia Augustine, James Gill, and Dean Stout

Please address all communications to

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C. 20436

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
Stock Number 049-000-00046-4

$ 5.25

CONTENTS

INTRODUCTION

This is the sixtieth 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 consists of 15 sections, each covering a specified group (based principally on use) of organic chemicals as follows: Tar and tar crudes; primary products from petroleum and natural gas; intermediates; dyes; 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 800 producers.

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

Data are reported by producers for only those items where the volume of production or sales or value of sales exceeds certain minimums. Those minimums for all sections are 5,000 pounds of production or sales and $5,000 of value of sales with the following exceptions: Plastics and resin materials--50,000 pounds or $50,000; pigments, medicinal chemicals, flavor and perfume materials, rubber-processing chemicals, and elastomers--1,000 pounds or $1,000. They are usually given in terms of undiluted materials; however, products of 95 percent or more purity are considered to be 100 percent pure. Commercial concentrations are applied to 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 item 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 which 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.

Table 1 of the Appendix is a directory, alphabetized by the names of the manufacturers reporting in all sections and includes their office addresses.

Table 2 of the Appendix summarizes and gives the competitive status of U.S. general imports in 1976 of benzenoid intermediates and finished benzenoid products, entered under schedule 4, parts 1B and 1C, of the Tariff Schedules of the United States.

Table 3 of the Appendix lists synonymous names for cyclic intermediates. Information on all 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 Colourists.

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

> *PRODUCTION is the total quantity of a commodity made available by ORIGINAL MANUFACTURERS ONLY within the customs territory of the United States (includes the 50 states, the District of Columbia, and Puerto Rico). It covers synthetic organic chemicals, specified crudes from petroleum and coal tar, and certain chemically described natural products, such as, alkaloids, enzymes, and perfume isolates. It is the sum--expressed in terms of 100% active ingredient unless otherwise specified in the reporting instructions--of the quantities:*
>
> *Produced, separated, and consumed in the same plant or establishment. A commodity is considered separated either when it is isolated from the reaction system or when it is not isolated, but weighed, analyzed, or otherwise measured. This includes byproducts and co-products that are not classifiable as waste materials;*

[1] Title 18, U.S.C. 1905 and Title 44, U.S.C. 3508.

INTRODUCTION

Produced and not isolated, but directly converted to a finished or semifinished item not included in this report (e.g., polyester film, polyurethane tires, nylon fiber, bar soap, etc.). (See specific instructions in individual sections);
Produced and transferred to other plants or establishments of the same firm or 100%-owned subsidiaries or affiliates;
Produced and sold to, or bartered with, other firms (including less than 100% owned subsidiaries);
Produced for others under toll agreements (see general instructions);
Produced and held in stock.

PRODUCTION EXCLUDES:
Purification of a commodity, which is purchased by, or transferred from within, your 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 agreements;
Shipments to subsidiary or affiliated companies, provided the ownership is less than 100%.

SALES EXCLUDES:
All intra-company transfers within a corporate entity;
All shipments to 100% owned subsidiary or affiliated companies;
All resales of imported or purchased material, including materials obtained by barter;
All shipments of a commodity produced for others under toll agreements.

VALUE OF SALES is the net selling price f.o.b. plant or warehouse, or delivered price. F.o.b. prices are preferred, but if they are not readily available from your records, delivered prices are acceptable.

SUMMARY

Combined production of all synthetic organic chemicals, tar, tar crudes, and primary products from petroleum and natural gas in 1976 was 289,292 million pounds--an increase of 17.3 percent over the output in 1975 (see table 1). Sales of these materials in 1976, which totaled 151,760 million pounds valued at $33,657 million, were 11.8 percent larger than in 1975 in terms of quantity and 19.0 percent larger in terms of value. These figures include data on proudction and sales of chemicals measured at several successive steps in the manufacturing process, and therefore, they necessarily reflect some duplication.

In 1976 production of all synthetic organic chemicals, including cyclic intermediates and finished products, totaled 162,873 million pounds, or 4.9 percent more than the output in 1975. Cyclic intermediates showed an apparent decrease in production of 37.0 percent, however, several items previously included in this section were transferred to the section on primary products from petroleum and natural gas. This latter section, therefore, shows'an inordinately high apparent increase in production. Pesticides and related products (1,364 million pounds), with a decline of 14.9 percent from 1975, was the only other section to exhibit a decline in production. Rubber-processing chemicals (384 million pounds) lead the increase with a gain of 37.6 percent; organic pigments (68 million pounds) were 36.4 percent greater than in 1975; flavor and perfume materials (129 million pounds) increased 27.1 percent; dyes (256 million pounds) increased 24.4 percent; plastics and resin materials (29,680 million pounds) increased 19.4 percent; elastomers (synthetic rubber) (5,386 million pounds) increased 17.6 percent; plasticizers (1,587 million pounds) increased 17.4 percent; medicinal chemicals (236 million pounds) increased 13.2 percent; and surface-active agents (4,582 million pounds) increased 5.4 percent. The sections on miscellaneous end-use chemicals and chemical products and miscellaneous cyclic and acyclic chemicals were previously included in the section listed as miscellaneous chemicals. Together these two new sections show an increase of 15.3 percent over the output of miscellaneous chemicals in 1975.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS AND THEIR RAW MATERIALS: U.S. PRODUCTION AND SALES, 1975 AND 1975

	PRODUCTION			SALES					
				QUANTITY			VALUE		
	1975	1976	Increase, or decrease (-), 1976 over 1975[1]	1975	1976	Increase, or decrease (-), 1976 over 1975[1]	1975	1976	Increase, or decrease (-), 1976 over 1975[1]
	Million pounds	*Million pounds*	*Percent*	*Million pounds*	*Million pounds*	*Percent*	*Million pounds*	*Million pounds*	*Percent*
Grand Total[2]	246,587	289,292	17.3	135,773	151,760	11.8	28,293	33,657	19.0
Tar	6,455	6,364	-1.4	2,848	2,905	2.0	99	96	-3.0
Tar crudes[3]	6,797	7,182	5.7	4,378	4,519	3.2	268	285	6.3
Primary products from Petroleum and Natural Gas[4]	78,089	112,873	44.5	44,562	59,083	32.6	2,988	5,490	83.7
Synthetic organic chemicals total[2]	155,246	162,873	4.9	83,990	85,253	1.5	24,939	27,786	11.4
Cyclic intermediates[4]	31,412	19,796	-37.0	14,780	7,664	-48.2	3,169	2,387	-24.7
Dyes	206	256	24.4	209	250	19.7	476	620	30.4
Organic pigments	50	68	36.4	42	54	27.9	186	261	40.4
Medicinal chemicals	208	236	13.2	149	161	8.1	772	742	-4.0
Flavor and perfume materials	101	129	27.1	83	111	34.1	143	195	36.2
Plastics and resin materials	24,868	29,680	19.4	20,955	24,337	19.5	7,003	8,619	23.1
Rubber-processing chemicals	279	334	37.6	204	224	9.8	207	247	19.3
Elastomers (synthetic rubber)	4,579	5,386	17.6	3,948	3,710	-6.0	1,458	1,529	4.9
Plasticizers	1,352	1,587	17.4	1,338	1,466	9.6	470	566	-21.1
Surface-active agents	4,349	4,582	5.4	2,182	2,512	15.1	717	821	14.5
Pesticides and related products	1,603	1,364	-14.9	1,328	1,193	-10.2	2,366	2,410	1.8
Miscellaneous end-use chemicals and chemical products[5]	-	15,851	-	-	9,160	-	-	2,251	-
Miscellaneous cyclic and	(86,238)			(38,774)			(7,971)		
acyclic chemicals[5]	-	83,553	-	-	33,912	-	-	7,137	-

[1] Percentages calculated from figures rounded to thousands.
[2] Because of rounding, figures may not add to the totals shown.
[3] Estimated in part to avoid disclosing individual company operations.
[4] The large increases in 1976 over 1975 for primary products from petroleum and natural gas, and decreases for cyclic intermediates were caused, in part, by the transfer, in 1976, of ethylbenzene, cyclohexane, styrene, m-xylene, o-xylene, p-xylene, and cumene, from the intermediates section to the primary products from petroleum and natural gas section.
[5] Items in these two sections were previously included in the section named miscellaneous chemicals

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 materials, elastomers, 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 intermediate 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 1976 was 162,873 million pounds or 4.9 percent more than the output of 155,246 million pounds reported for 1975 and 55.5 percent more than the output of 104,711 million pounds reported for 1967 (see table 2). Sales of synthetic organic chemicals in 1976 amounted to 85,253 million pounds, valued at $27,786 million, compared with 83,990 million pounds, valued at $24,939 million in 1975 and 55,177 million pounds, valued at $10,438 million in 1967. Production of all cyclic products (intermediates and finished products combined) in 1976 totaled 44,192 million pounds or 11.5 percent less than the 49,963 million pounds reported for 1975 and 32.0 percent more than the 33,479 million pounds reported for 1967, however, the transfer of several items, in 1976, from the cyclic intermediates section to the section on primary production from petroleum and natural gas has caused the output of cyclic products to appear much lower in relation to 1967 and 1975 than would otherwise have resulted. Production of all acyclic products in 1976 totaled 118,681 million pounds, or 12.7 percent more than the 105,283 million pounds reported for 1975 and 66.6 percent more than the 71,232 million pounds reported for 1967.

TABLE 2.--SYNTHETIC ORGANIC CHEMICALS: SUMMARY OF U.S. PRODUCTION AND SALES OF INTERMEDIATES AND FINISHED PRODUCTS, 1967, 1975, AND 1976

[Production and sales in thousands of pounds; sales value in thousands of dollars]

CHEMICAL	1967[1]	1975	1976	Increase, or decrease (-) 1976 over 1967	1976 over 1975
Organic chemicals, cyclic and acyclic, Grand total:				*Percent*	*Percent*
Production	104,711,357	155,245,961	162,873,300	55.5	4.9
Sales	55,176,823	83,990,306	85,252,538	54.5	1.5
Sales value	10,438,453	24,938,928	27,785,930	166.2	11.4
Cyclic, total:					
Production	33,479,469	49,962,996	44,192,345	32.0	-11.6
Sales	19,328,628	28,562,903	23,993,824	24.1	-16.0
Sales value	4,610,293	11,316,374	11,547,071	150.5	2.0
Acyclic, total:					
Production	71,231,888	105,282,965	118,680,955	66.6	12.7
Sales	35,848,195	55,427,403	61,258,714	70.9	10.5
Sales value	5,828,160	13,622,554	16,238,859	178.6	18.8
1. *Cyclic Intermediates*[2]					
Production	20,793,132	31,412,575	19,795,832	-4.8	-37.0
Sales	9,461,180	14,779,570	7,663,691	-19.0	-48.2
Sales value	1,000,359	3,169,243	2,386,993	138.6	-24.7
2. *Dyes*					
Production	206,240	206,034	256,250	24.2	24.4
Sales	198,592	208,768	249,887	25.8	19.7
Sales value	332,049	475,609	620,294	86.8	30.4
3. *Organic Pigments*					
Production	53,322	49,653	67,727	27.0	36.4
Sales	42,867	42,372	54,211	26.5	27.9
Sales value	108,354	185,990	261,089	141.0	40.4
4. *Medicinal Chemicals*					
Cyclic:					
Production	110,129	123,624	136,374	23.8	10.3
Sales	70,120	77,847	79,581	13.5	2.2
Sales value	348,873	676,431	642,829	84.2	-5.0
Acyclic:					
Production	69,941	84,765	99,431	42.2	17.3
Sales	56,804	70,966	81,253	43.0	14.5
Sales value	36,402	95,674	98,692	171.1	3.2

See footnotes at end of table.

TABLE 2.--SYNTHETIC ORGANIC CHEMICALS: SUMMARY OF U.S. PRODUCTION AND SALES OF INTERMEDIATES AND FINISHED PRODUCTS, 1967, 1975, AND 1976--CONTINUED

[Production and sales in thousands of pounds; sales value in thousands of dollars]

CHEMICAL	1967[1]	1975	1976	Increase, or decrease (-) 1976 over 1967	1976 over 1975
5. Flavor and Perfume Materials				Percent	Percent
Cyclic:					
Production	57,978	44,751	55,090	-5.0	23.1
Sales	47,285	33,044	48,503	2.6	46.8
Sales value	52,866	91,851	125,479	137.4	36.6
Acyclic:					
Production	53,553	56,589	73,756	37.7	30.3
Sales	49,311	49,639	62,445	26.6	25.8
Sales value	40,495	51,580	69,843	72.5	35.4
6. Plastics and Resin Materials					
Cyclic:					
Production	5,033,497	7,806,999	8,943,083	77.7	14.6
Sales	4,224,121	6,696,592	7,684,865	81.9	14.8
Sales value	1,036,940	2,763,341	3,113,430	200.2	12.7
Acyclic:					
Production	8,759,452	17,060,723	20,737,169	136.7	21.5
Sales	7,753,242	14,258,062	17,151,982	121.2	20.3
Sales value	1,635,690	4,239,701	5,505,923	236.6	29.9
7. Rubber-Processing Chemicals					
Cyclic:					
Production	220,139	224,997	334,735	52.0	48.8
Sales	169,970	172,637	186,393	9.7	8.0
Sales value	116,318	186,853	218,263	87.6	16.8
Acyclic:					
Production	43,994	53,995	49,688	12.9	-8.0
Sales	30,878	31,198	37,879	22.7	21.4
Sales value	15,477	20,040	28,594	84.8	42.7
8. Elastomers (Synthetic Rubber)					
Cyclic:					
Production	2,297,637	2,778,884	3,146,083	36.9	13.2
Sales	1,940,099	2,302,389	1,970,636	1.6	-14.4
Sales value	439,580	639,357	560,386	27.5	-12.4
Acyclic:					
Production	1,524,908	1,799,841	2,239,717	46.9	24.4
Sales	1,321,945	1,645,726	1,739,501	31.6	5.7
Sales value	434,657	818,335	968,676	122.8	18.4
9. Plasticizers					
Cyclic:					
Production	929,871	1,038,204	1,185,909	27.5	14.2
Sales	865,084	1,042,188	1,110,869	28.4	6.6
Sales value	167,827	307,923	360,453	114.8	17.1
Acyclic:					
Production	332,908	313,498	401,525	20.6	28.1
Sales	296,767	296,129	354,842	19.6	19.8
Sales value	93,142	162,467	205,812	121.0	26.7
10. Surface-Active Agents					
Cyclic:[3]					
Production	1,418,444	1,921,358	2,312,728	63.0	20.4
Sales	852,238	1,084,899	1,393,489	63.5	28.4
Sales value	95,810	211,449	319,422	233.4	51.1
Acyclic:					
Production	2,060,851	2,428,039	2,269,670	10.1	-6.5
Sales	897,786	1,096,680	1,118,596	24.6	2.0
Sales value	220,877	505,972	501,818	127.2	-.8

See footnotes at end of table.

TABLE 2.--SYNTHETIC ORGANIC CHEMICALS: SUMMARY OF U.S. PRODUCTION AND SALES OF INTERMEDIATES AND FINISHED PRODUCTS 1967, 1975, AND 1976--CONTINUED

[Production and sales in thousands of pounds; sales value in thousands of dollars]

CHEMICAL	1967[1]	1975	1976	Increase, or decrease (-) 1976 over 1967	1976 over 1975
11. Pesticides and Related Products				*Percent*	*Percent*
Cyclic:					
Production	823,158	1,196,310	940,263	14.2	-21.4
Sales	681,532	964,739	838,814	23.1	-13.1
Sales value	627,742	1,891,064	1,843,896	193.7	-2.5
Acyclic:					
Production	226,505	406,706	424,128	87.2	4.3
Sales	215,831	363,297	353,790	63.9	-2.6
Sales value	159,301	475,319	566,238	255.4	19.1
12. Miscellaneous End-Use Chemicals and Chemical Products [4]					
Cyclic:					
Production	(1,535,922)	(3,159,607)	3,137,093	...	...
Sales	(775,540)	(1,157,858)	909,875	...	...
Sales value	(283,575)	(717,263)	412,387	...	...
Acyclic:					
Production	(58,159,771)	(83,078,809)	12,713,987	...	...
Sales	(25,225,631)	(37,615,706)	8,249,695	...	...
Sales value	(3,192,119)	(7,253,466)	1,838,740	...	...
13. Miscellaneous Cyclic and Acyclic Chemicals [4]					
Cyclic:					
Production	...	...	3,881,178	...	...
Sales	...	...	1,803,010	...	...
Sales value	...	...	682,150	...	...
Acyclic:					
Production	...	...	79,671,884	...	...
Sales	...	...	32,108,731	...	...
Sales value	...	...	6,454,523	...	...

[1] Standard reference base period for Federal Government general-purpose index numbers.
[2] The large decrease for cyclic intermediates were caused, in part, by the transfer, in 1976, of ethylbenzene, cyclohexane, styrene, m-xylene, o-xylene, p-xylene, and cumene, from the intermediates section to the primary products from petroleum and natural gas section.
[3] Includes ligninsulfonates.
[4] Items in these two sections were previously included in the section named miscellaneous chemicals.

The following tabulation shows, by chemical groups, the number of companies that reported production in 1976 of one or more of the chemicals included in the groups listed in table 2:

Chemical group	*Number of companies*
Cyclic intermediates	175
Dyes	42
Organic pigments	34
Medicinal chemicals	99
Flavor and perfume materials	47
Plastics and resin materials	253
Rubber-processing chemicals	32
Elastomers (synthetic rubber)	32
Plasticizers	57
Surface-active agents	178
Pesticides and related products	85
Miscellaneous end-use chemicals and chemical products	126
Miscellaneous cyclic and acyclic chemicals	245

TAR

John J. Gersic

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

The quantity of tar produced in the United States in 1976 was almost entirely coal tar, which amounted to 636 million gallons (see table 1). Production in 1976 was 1.4 percent less than the 646 million gallons of coal tar produced in 1975. Sales of coal tar in 1976 amounted to 291 million gallons compared with 285 million gallons in 1975. U.S. production of water-gas and oil-gas tars was not reported to the Commission for 1975 or 1976; production of these tars in 1968 amounted to 21 million gallons, according to trade publications.

Consumption of tar in 1976 amounted to an estimated 604 million gallons, of which 72 percent was consumed in distillation. Tar used by the producers as fuel amounted to 165 million gallons; a lesser amount, 5.5 million gallons, was consumed by coke-oven operators in miscellaneous uses (see table 1A).

TAR CRUDES

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 and 1B.

Domestic production of industrial and specification grades of benzene reported by coke-oven operators and petroleum refinery operators in 1976 amounted to 1,425 million gallons--39.2 percent more than the 1,024 million gallons reported for 1975. These statistics include data for benzene produced from light oil and petroleum. Sales of benzene by coke-oven operators and petroleum refiners in 1976 amounted to 637 million gallons compared with 548 million gallons in 1975. In 1976 the output of toluene (including material produced for use in blending in aviation fuel) amounted to 999 million gallons--42 percent more than the 705 million gallons reported for 1975. Sales of toluene in 1976 were 618 million gallons compared with 441 million gallons in 1975. The output of xylene in 1976 (including that produced for blending in motor fuels) was 722 million gallons, compared with 639 million gallons in 1975. Over 99 percent of the 722 million gallons of xylene produced in 1976 was obtained from petroleum sources.

Production (or sales) figures on crude naphthalene from coal-tar oils in 1976 could not be published without disclosing the operations of individual companies. Production of petroleum-derived naphthalene in 1976 amounted to 107 million pounds, compared with 110 million pounds in 1975. Production figures on road tar for 1976 cannot be published; in 1972 production amounted to 30 million gallons.

Some of the products obtained from tar and included in the statistics in table 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.

Data for 1976 tar crudes were supplied by 9 companies and company divisions.

SECTION I

Tar and Tar Crudes

Extensive revisions were made to the 1976 SOC questionnaire. These revisions were made after consultation with an industry task force, government agencies, and considerable reflection on what the finished report's objectives should be.

A new subsection B (Inventory and Capacity of Selected Items for Fuel, Chemical and Other Uses) was added to the questionnaire for Section I; its purpose was to obtain inventory and capacity data on benzene, toluene, xylenes and benzene-toluene-xylenes concentrate. These data will increase the value of the report to its users. However, so few of the respondents have yet completed subsection B that it is not possible to publish a meaningful compilation of these data at this time.

Organic Chemicals From Coal

Although coal-tar chemicals have been around a long time, the manufacture of coal-tar dyestuffs, medicinals, and photographic chemicals was relatively unimportant in the United States until after World War I. Prior to that time Germany dominated the world's production and trade, accounting for three-fourths of world production of coal-tar dyes and even more of that of coal-tar medicinals. U.S. shortages caused by the war, coupled with increases in U.S. import duties on dyestuffs and related products, encouraged U.S. capital investment in a domestic dye industry. 1/

Coal remained the basis of the world's synthetic organic chemicals industry through the 1930's, until the development of petrochemical processes, which was due at least in part to the abundance of relatively cheap petroleum. The U.S. petrochemical industry was developed during World War II to supply synthetic materials to replace natural products which were unavailable. The industry expanded considerably after the war with the discovery of large Middle East oilfields.

Because of the availability of petroleum and its easy transport, it rapidly displaced coal as the primary fossil fuel, and at the same time petrochemicals largely displaced coal-tar chemicals.

Prospects for the "chemicals from coal" industry

Traditionally, the major source of "chemicals from coal" has been the light oils produced as coke-oven byproducts during the carbonization of coal. These oils contain benzene, toluene, and xylene along with lesser amounts of other chemicals. Few coke ovens are built today for any purpose other than the production of metallurgical coke, most of which has been used in blast furnaces for steel production. But today, owing to the use of supplemental fuels in blast furnaces, the consumption of coke per ton of metal produced is decreasing and will probably continue to decrease, at least in the near future, although metal production will probably continue to increase.

If there is to be a renaissance of production of chemicals from coal, new technology must play a leading part. Of particular concern are high manufacturing costs, sulfur content problems, and the increasing tendency of producers of light oils to sell these oils to petroleum refineries, which process them along with their petroleum fractions. This, however, does not mean that customary processes will be replaced entirely. For example, in the United Kingdom there are presently three producers of coal liquids producing some 19,000 barrels of chemical feedstock a day, with projected production of 22,000 barrels a day by 1980. 2/

1/ United States Tariff Commission, Dyes and Other Coal-Tar Chemicals, 1918, p.11.

2/ Oil and Gas Journal, Dec. 5, 1975, p. 82.

About a 10-percent increase in the price of naphtha or gas oil adds about 2 cents a pound to the ethylene transfer price, 1/ which would make ethylene from coal economically competitive.

Currently, aromatics from coal are roughly competitive with those from petroleum. The following tabulation contains cost data from aromatics arrived at in the Chem Systems study: 2/

Process	Aromatic cost (cents per gallon)
Hydropyrolysis	52
Crude oil processing	60
H-coal	64
COED 3/	78

Overall, it therefore appears that chemicals from coal will probably increase in importance in the future. With our large coal deposits, raw materials should be readily available. In addition, expected domestic shortages of crude petroleum could be partially alleviated by the diversion of feedstocks intended for petrochemical manufacture to fuel uses, thus decreasing import dependence. Further, depending upon the relative prices of coal and crude petroleum, chemicals from coal could help the United States increase its healthy trade surplus in chemicals.

Trade

Though imports of benzene, toluene, and xylene doubled from 1971 to 1976 (from $48 million to $96 million), exports increased more than elevenfold (from $13 million to $156 million). The largest growth was in toluene exports, which rose from $2.6 million in 1971 to $75.2 million in 1976.

Benzene has had a negative trade balance (in both volume and value) since 1971. This has been due to the availability of cheap benzene from overseas sources. Imports decreased in 1976, and exports increased to the point that the trade balance was less unfavorable than in the preceding 5 years. In 1977, as the world continues to emerge from recession, benzene exports could exceed imports again, as last happened in 1970.

Toluene had a negative trade balance from 1969 through 1973. In each year since 1974 the trade balance has become increasingly favorable. Most of the toluene exports are used for octane improvement of gasoline and as solvents. As decreasing quantities of additives are permitted to improve octane, the demand for certain aromatics, including toluene, should continue to rise. However, while this means an increasing export market for toluene, it is possible that increasing demand in the United States could prevent our export trade from increasing as rapidly as otherwise might be expected.

1/ Chem Systems, Inc., op. cit., p. 224.
2/ Ibid., p. 58.
3/ Pyrolysis Process.

New technology

New developments in coal technology are centered, essentially, in the areas of combined fuels/chemicals operations, synthetic natural gas, coal-chemical complexes, and flash hydrogenation. The last is the newest and perhaps the most promising route to a more attractive chemical product mix from coal. The principal products are benzene, toluene, xylene, char, and smaller quantities of methane and ethane. The aromatics would be used to make other chemicals or in gasoline. The methane would be the feedstock for synthetic natural gas, while the ethane would be the feedstock for producing ethylene. The development of flash hydrogenation is principally funded by the Government, although some private funds have also been invested in research and development. The Energy Research and Development Administration is deeply involved and has at least four outside principal contractors. 1/

The coal-chemical complexes could include synthetic natural gas plants, flash hydrogenation facilities, and acetylene-processing hardware. Such complexes could lead to a quadrupling of coal's share of markets for a dozen key chemicals from 1.6 percent in 1975 to 6.6 percent in 1985. 2/

A plan linking together 11 major process steps into a "comprehensive combined energy and petrochemicals production complex" has been presented by a prominent engineering firm at a national technical society meeting. 3/ The complex is designed to consume 66,000 tons of coal a day and produce 17 major products, including 1 billion pounds of ethylene and 434 million pounds of propylene a year, 34 million gallons of benzene, 16 million gallons of toluene and 71.5 million gallons of mixed xylenes a year and 2,395 tons of sulfur and 214 tons of ammonia a day. 4/ Assuming extensive development of such complexes, in 1980 and 1990 coal-derived chemicals could supply the following shares of U.S. demand for the following basic organic chemicals (in percent): 5/

	1980	1990
Ethylene	10.0	10.0
Propylene	8.2	8.2
Benzene	6.4	7.5
Toluene	3.8	4.6
Xylene	19.2	23.0

The yield pattern of chemicals from coal depends upon both the process and the type of coal used. A recent patent on flash hydrogenation indicates a yield of 46 percent benzene, plus minor amounts of toluene and

1/ Chemical Week, Sept. 1, 1976, p. 33.
2/ Oil and Gas Journal, Feb. 2, 1976, p. 90.
3/ Chemical and Engineering News, Sept. 6, 1976, p. 7.
4/ Ibid., p. 8.
5/ Ibid., p. 33.

xylene. 1/ Another patent claims a 90-percent conversion of coal to liquids and gases, 2/ while an entrained-flow reactor using North Dakota lignite for feedstock yielded 15 percent benzene, 10 percent oils, 31 percent methane, 4 percent propane, and char and unreacted carbon. 3/ In general the major task for coal conversion technology is to increase the yields of gases and liquids at the expense of char and unreacted material.

Economics of coal chemicals vis-a-vis petrochemicals

To be commercially viable, any chemical-from-coal process must be able to compete with processes based on natural gas or petroleum. As most of the coal processes generate synthetic natural gas, the "wellhead" price of natural gas is obviously very important. It has been stated that coal-based projects are likely to be started as soon as the "wellhead" price reaches around $3.00 per million Btu's. 4/ Currently, interstate natural gas is sold for a maximum of $1.42 per thousand cubic feet (roughly 1 million Btu's), while intrastate natural gas, not being regulated, has been sold at times for as much as about $2.50 per thousand cubic feet. The National Energy Plan proposes that "all new gas sold anywhere in the country from new reservoirs would be subject to a price limitation at the Btu equivalent of the average refiner acquisition price (without tax) of all domestic crude oil." Under this proposal the price would be approximately $1.75 per thousand cubic feet at the beginning of 1978, 5/ and the refiner acquisition price of all domestic crude oil would have to reach approximately $18.00 a barrel for natural gas to be priced at $3.00 per thousand cubic feet. It appears that under the proposed oil pricing scheme outlined in The National Energy Plan such a price could only occur in the 1980's, assuming an inflation rate in the United States of 5 percent a year.

Ethylene-from-coal economics based on the two most promising coal-based routes (methanol homologation and dimethyl ether cracking) are compared with the petroleum-based routes in the following tabulation, which contain the transfer prices for ethylene which were arrived at in the Chem Systems study: 6/

Process	Ethylene transfer price (cents per pound)
Natural gas liquids cracking	16.61
Gas oil	17.24
Naphtha cracking	17.66
Dimethyl ether cracking	18.22
Methanol homologation	19.89
Coal syncrude	22.70

1/ Chemical Week, Sept. 1, 1976, p. 33.
2/ Ibid., p. 36.
3/ Ibid.
4/ Hydrocarbon Processing, Mar. 11, 1977, p. 15.
5/ Executive Office of the President, Energy and Policy Planning, The National Energy Plan, Apr. 29, 1977, p. 53.
6/ Chem Systems, Inc., Chemicals from Coal and Shale: An R&D Analysis for the National Science Foundation, June 1975, p. 224.

245-856 O - 77 - 2

The xylene trade balance became positive in 1974 and has increased each year since. It had been negative in the previous 5 years. As with toluene, major end-uses include those as a gasoline octane improver and as a solvent. Exports have increased during each of the last 6 years and could continue, depending primarily on domestic xylene demand for use in nonleaded gasoline.

A renaissance in the chemicals-from-coal industry could greatly expand our trade surplus in benzene, toluene, and xylene. Lowered manufacturing costs resulting from technological breakthroughs in the production of aromatics from coal could enable the United States to maintain and possibly increase export markets even in the face of large-scale manufacture of aromatics in the Middle East.

TABLE 1.--TAR AND TAR CRUDES: U.S. PRODUCTION AND SALES, 1976

[Listed below are all tar crudes for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists separately all products for which data on production and/or sales were reported and identifies the manufacturers of each]

	UNIT OF QUANTITY	PRODUCTION	SALES		
			QUANTITY	VALUE	UNIT VALUE[1]
				1,000 dollars	
Tar:[2] Coke-oven operators	1,000 gal	636,382	290,536	96,417	$0.332
Crude light oil:[3] Coke-oven operators	1,000 gal	198,056	104,645	52,532	.502
Intermediate light oil: Coke-oven operators	1,000 gal	5,419	1,923	543	.282
Light-oil distillates:					
Benzene, specification and grades, total[4]	1,000 gal	1,425,222	637,284	489,485	.768
Coke-oven operators	1,000 gal	60,411	59,822	47,526	.794
Petroleum refiners	1,000 gal	1,364,811	577,462	441,959	.765
Toluene, all grades, total[4]	1,000 gal	998,976	618,291	334,376	.541
Coke-oven operators	1,000 gal	8,824	8,446	4,642	.550
Petroleum refiners	1,000 gal	990,152	609,845	329,734	.541
Xylene, all grades, total[4]	1,000 gal	722,014	714,546	352,583	.493
Coke-oven operator	1,000 gal	1,496	1,251	732	.585
Petroleum refiners	1,000 gal	720,518	713,295	351,851	.493
Solvent naphtha:[3] Coke-oven operators	1,000 gal	1,968	1,792	713	.398
Crude tar-acid oils: Coke-oven operators	1,000 gal	5,678	5,679	2,143	.377
Creosote oil (Dead Oil) (tar distillers and coke-oven operators) (100% creosote basis), total	1,000 gal	113,967	78,284	43,203	...
Distillate as such (100% creosote basis)	1,000 gal	77,126	51,913	25,677	.474
Creosote content of coal tar solution (100% creosote basis)	1,000 gal	36,841	26,371	17,526	([5])
All other distillates, total	1,000 gal	...	35,321	12,740	.361
Coke-oven operators, total	1,000 gal	6,475	3,750	856	.228
From light oil	1,000 gal	3,993	1,398	505	.361
Other	1,000 gal	2,482	2,352	351	.149
Tar distillers[6]	1,000 gal	...	31,571	11,884	.376
Tar, refined, for uses other than road tar	1,000 gal	16,668	5,712	3,038	.532
Pitch of tar (tar distillers and coke-oven operators), total	1,000 tons	1,314	984	100,440	102.073
Soft (water softening point less than 100° F): Coke-oven operators	1,000 tons	516	274	25,347	92.507
Other[7]	1,000 tons	798	710	75,093	105.765

[1] Unit value per gallon, pound, or ton as specified.
[2] Includes only data for coal tar reported to the Division of Fuels Data, U.S. Bureau of Mines, (Mineral Industry Surveys, Coke and Coal Chemicals, Feb. 11, 1977). Data on U.S. Production of water-gas tar and oil-gas tar are not collected by the U.S. International Trade Commission, but according to trade publications, production of these tars amounted to 21 million gallons in 1968.
[3] Data reported by tar distillers are not included because publication would disclose the operations of individual companies.
[4] 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.

Footnotes for table 1--Continued

In 1976, production of coal-tar solution containing creosote (100% solution basis) amounted to 52,439 thousand gallons; sales were 36,076 thousand gallons valued at 17,526 thousand dollars, with a unit value of $0.486 per gallon.

[6] Includes data for crude light oil, solvent naphtha, pyridine crude bases, crude tar-acid oils, crude cresylic acid, methylnaphthalene, crude tar for other uses, unspecified tar distillates, road tar and refined anthracene, crude tetralin, crude coal tar solvent, carbon black, and primary and refractory oil.

[7] Includes pitch emulsion, medium and hard pitch, and small amounts of soft pitch.

Note.--Statistics for materials produced in coke and gas-retort ovens are compiled by the Division of Fuels Data, U.S. Bureau of Mines, Department of the Interior. Statistics for materials produced in tar and petroleum refineries are compiled by the U.S. International Trade Commission.

TABLE 1A.--TAR: U.S. PRODUCTION AND CONSUMPTION, 1975 AND 1976

(In thousands of gallons)

Product	1975	1976
PRODUCTION		
Coal tar from coke-oven byproduct plants, total[1]	645,537	636,382
CONSUMPTION		
Total	617,235	604,376
Tar consumed by distillation, total	450,159	433,747
Coal tar distilled or topped by coke-oven operators[1]	178,147	163,051
Coal tar and water-gas tar distilled by tar distillers[2]	272,012	270,696
Tar consumed by the producers chiefly as fuel[1]	162,112	165,169
Coal tar consumed at coke-oven plants in miscellaneous uses[1]	4,964	5,460

[1] Reported to the Division of Fuels Data, U.S. Bureau of Mines.

[2] Reported to the U.S. International Trade Commission. Represents tar purchased from companies operating coke-ovens and gas-retort plants and distilled by companies operating tar-distillation plants. Statistics also include tar consumed other than by distillation by tar distillers.

TABLE 1B.--Tar and tar crudes: Summary of U.S. production of specified products, 1967, 1975, and 1976

[Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.]

PRODUCT	UNIT OF QUANTITY	1967[1]	1975	1976	INCREASED, OR DECREASED (-) 1976 OVER: 1967	1976 OVER 1975
					Percent	Percent
Tar[2]	1,000 gal	780,334	645,537	636,382	-18.4	-1.4
Benzene:[3]						
Coke-oven operators	1,000 gal	90,642	65,050	60,411	-33.4	-7.1
Petroleum refiners	1,000 gal	878,704	958,863	1,364,811	55.3	42.3
Total	1,000 gal	969,346	1,023,913	1,425,222	47.0	39.2
Toluene:[3]						
Coke-oven operators	1,000 gal	19,357	9,841	8,824	-54.4	-10.4
Petroleum refiners	1,000 gal	[4] 624,454	695,226	990,152	58.6	42.4
Total	1,000 gal	643,811	705,067	998,976	55.2	41.7
Xylene:[3]						
Coke-oven operators	1,000 gal	5,488	1,884	1,496	-72.7	-20.6
Petroleum refiners	1,000 gal	[4] 449,349	637,215	720,518	60.3	13.1
Total	1,000 gal	454,837	639,099	722,014	58.7	13.0
Naphthalene:						
Crude[5]	1,000 lb	520,991	([6])	([6])	([6])	([6])
Petroleum naphthalene, all grades	1,000 lb	376,679	109,919	107,191	-71.5	-2.5
Total	1,000 lb	897,670	([6])	([6])	([6])	([6])
Creosote oil (Dead oil):[7]						
Distillate as such (100% creosote basis)	1,000 gal	108,832	79,164	77,126	-29.2	-2.6
Creosote content of coal tar solution (100% creosote basis)	1,000 gal	17,402	35,671	36,841	111.7	3.3
Total	1,000 gal	126,234	114,835	113,967	-9.7	-.8

[1] Standard reference base period for Federal Government general-purpose index numbers.
[2] Includes only data for coal tar reported to the Division of Fuels Data, U.S. Bureau of Mines.
[3] Data reported by tar distillers are not included because publication would disclose the operations of individual companies.
[4] Includes data for material produced for use in blending motor fuels. Statistics are not comparable with monthly figures which include some o-xylene.
[5] Naphthalene solidifying at less than 79°C. Figures include production by tar distillers and coke-oven operators and represent combined data for the commercial grades of naphthalene. Because of conversion between grades, the figures may include some duplication. Statistics on naphthalene refined from domestic crudes are reported in the section on cyclic intermediates.
[6] Statistics for 1975 and 1976 cannot be published; to do so would disclose the operations of individual companies.
[7] Includes data for creosote oil produced by tar distillers and coke-oven operators and used only in wood preserving.

TABLE 2.--Tar crudes for which U.S. production or sales were reported, identified by manufacturers, 1976

[Tar crudes for which separate statistics are given in table 1 are marked with an asterisk (*); products not so marked do not appear in table 1 because the reported data are accepted in confidence and may not be published. Manufacturers' identification codes shown below are taken from table 3. Table 3 identifies all U.S. producers of tar crudes (except producers that report to the Division of Fuels Data, U.S. Bureau of Mines)]

Product	Manufacturers' identification codes (according to list in table 3)
*Crude light oil[1]	CBT.
*Light-oil distillates: Solvent naphtha[1]	NEV.
Pyridine, crude bases[1]	KPT.
Naphthalene, crude, solidifying at:[1]	
Less than 74° C	ASC, COP.
74° C. to less than 79° C.:	
74° C. to less than 76° C	KPT.
76° C. to less than 79° C	ASC, KPT.
Methylnaphthalene	KPT.
*Crude tar-acid oils:[1]	
Tar-acid content 5% to less than 24%	KPT.
Tar-acid content 24% to 50%	ASC.
Cresylic acid, crude	KPT, PRD.
*Creosote oil (Dead oil):[1]	
*Distillate as such	ASC, CBT, COP, HUS, KPT, RIL, WTC.
*Creosote in coal tar solution	ASC, KPT, RIL, WTC.
*All other distillate products[1]	ASC, KPT, WTC.
Tar, road	ASC, KPT, RIL.
Tar for other uses:	
Crude	KPT, RIL.
*Refined[1]	ASC, KPT, RIL.
*Pitch of tar:[1]	
*Soft (water softening point less than 110° F.)	ASC, KPT.
Medium (water softening point 110° F. to 160° F.)	ASC, CBT, COP, KPT, RIL.
Hard (water softening point above 160° F.)	ASC, HYS, KPT, RIL, WTC.
Pitch emulsion	JEN.

[1] Does not include manufacturers' identification codes for producers who report to the Division of Fuels Data, U.S. Bureau of Mines. Those producers are listed in the U.S. Bureau of Mines Mineral Industry Survey, November 6, 1976, entitled "Coke Producers in the U.S. in 1976."

TABLE 3.--Tar and tar crudes: Directory of manufacturers, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of tar and tar crudes to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company	Code	Name of company
ASC	Allied Chemical Corp.	KPT	Koppers Co., Inc., Organic Materials Div.
CBT	Samuel Cabot, Inc.	KPT	Koppers Co., Inc., Roads Materials Div.
COP	Coopers Creek Chemical Corp.	NEV	Neville Chemical Co.
HUS	Husky Industries, Inc.	RIL	Reilly Tar & Chemical Corp.
JEN	Jennison-Wright Corp.		

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS

John J. Gersic and J. Rōss Lewis, Jr.

Primary products that are derived from petroleum and natural gas[1] 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 tar are related to their intermediates and finished products. Many of the primary products derived from petroleum are identical with those derived from coal tar (e.g., benzene, toluene, and xylene). 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 to derive other chemicals. 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 xylene which are used in blending aviation and motor fuel.

The output of primary products derived from petroleum and natural gas as a group amounted to 112,873 million pounds in 1976. Production in 1975 was 78,089 million pounds. However, these totals can not be compared owing to transfer of items from the cyclic intermediates section to this section.[2]

The output of aromatic and naphthenic products from petroleum amounted to 48,167 million pounds in 1976, compared with 20,605 million pounds in 1975. Sales amounted to $2,757 million in 1976 and $897 million in 1975. The output of 1° and 2° benzene from petroleum in 1976 (9,827 million pounds) was 40.0 percent more than the 7,019 million pounds produced in 1975.

Production of all aliphatic hydrocarbons and derivatives from petroleum and natural gas was 64,706 million pounds in 1976, compared with 57,484 million pounds in 1975. Sales of these products were valued at $2,732 million in 1976 compared with $2,091 million in 1975. Production of ethylene was 22,475 million pounds in 1976--9.6 percent more than the 20,499 million pounds produced in 1975. The output of 1,3-butadiene in 1976 (3,507 million pounds) increased from the production in 1975 (2,597 million pounds). Production of 1,3-butadiene (3,682 million pounds) in 1974 was a record production.

Data for 1976 crude products from petroleum and natural gas for chemical conversion were supplied by 77 companies and company divisions.

---

[1] Statistics on aromatic chemicals from coal tar are given in the report on "Tar and Tar Crudes."

[2] Items transferred from cyclic intermediates are ethylbenzene, cyclohexane, styrene, m-xylene, o-xylene, p-xylene.

SECTION II

Primary Products from Petroleum and Natural Gas For Chemical Conversion

Three new subsections (i.e., A, B and D) were added to the 1976 SOC questionnaire for Section II. These sections were added after consultation with Government agencies, an industry task force, and extensive discussion with users of the report.

Each of the added subsections were designed to fulfill a particular need. Subsection A (Production and Sales of Selected Items for Fuel, Chemical and Other Uses) was designed to capture all of the basic aromatics and olefins that are produced regardless of use. Subsection B (Inventory and Capacity of Selected Items for Fuel, Chemical and Other Uses) was added to obtain inventory and capacity data for the basic aromatics and olefins. Subsection D's (Captive Uses of C_1 to C_4 Aliphatic Hydrocarbons for Use as Petrochemical Feedstock for Your Own Use) purpose was to capture all (nine) of the lower aliphatic hydrocarbons used as chemical feedstocks. Few respondents have yet supplied data; in many cases those sections completed must be corrected. Therefore, it is not possible to publish summaries of these sections at this time.

Olefins and Aromatics

Though the terms "olefins" and "aromatics" cover many products, most of the comments here will be directed toward ethylene, propylene, benzene, toluene, and xylene. These are the most important "building block" raw materials for all synthetic organic chemicals and are principally derived from petroleum and natural gas. They are used to make products such as chemical intermediates, plastics, synthetic fibers, synthetic rubber, pesticides, and detergents.

Primary products from petroleum and natural gas

Of the top 50 chemicals ranked by production in 1976, as compiled by a reputable trade publication, 11 were organic chemicals classifiable in section II of this report. These organic chemicals are listed in the following table by rank in the top 50 chemicals in 1975 and 1976; also included are average annual U.S. production growth rates for the periods 1966-71 and 1971-76. Of those chemicals listed, the first four are the organic chemicals with the largest production volume.

Future growth for these building-block chemicals is expected to continue to be strong. An industry forecast indicates that ethylene demand is expected to increase at an average annual rate of 8 percent a year through the end of this decade and 6 percent a year in the early 1980's. 1/ The fastest growing ethylene derivatives and their growth rates are expected to be high-density polyethylene (12 percent a year) and vinyl acetate (10 percent a year). 2/ Propylene demand is predicted to grow at a faster rate (8.5 to 9 percent a year) than ethylene through 1985 by at least one industry observer. 3/ The fastest growing derivatives will be polypropylene (12 percent a year) and propylene oxide (10 percent per year). Benzene demand growth is forecast to average about 5.6 percent a year from 1976 to 1985; however, it could be lower owing to at least a partial change from benzene to other feedstocks for the manufacture of maleic anhydride and nylon intermediates. Furthermore, benzene exposure levels as set by the Occupational Safety and Health Administration could limit its use in certain applications and increase its cost. 4/

The toluene growth rate is forecast to decrease considerably to about 4.5 percent a year from 1976 to 1980; even lower growth rates are possible from 1980 to 1985. Styrene is an important derivative of ethylene and benzene, and in 1976 its production accounted for some 44 percent of the benzene demand and about 6 percent of the ethylene demand. For the past 16 years styrene demand has grown at an average annual rate of 8.2 percent; this rate is predicted to decrease to about 6 percent through 1980 and to 5 percent from

---

1/ Chemical and Engineering News, Apr. 4, 1977, p. 9.
2/ Oil and Gas Journal, Mar. 28, 1977, p. 32.
3/ Chemical and Engineering News, Apr. 4, 1977, p. 10.
4/ Ibid., May 23, 1977, p. 10.

1980 to 1985. The fastest growing derivative from 1976 to 1980 is expected to be expanded polystyrene (12 percent a year.) Butadiene demand is expected to increase slowly through 1980 and then average 3.6 percent a year from 1980 to 1985. 1/

Changes in technology, production methods, and production centers

Among the major changes expected is the increasing use of heavier feedstock for ethylene production in the United States, with the result that increasing quantities of byproduct aromatics and butadiene will become available. It is also possible that increasing quantities of olefins and aromatics destined as such or in derivative form for world trade will be made in crude-petroleum- and natural-gas-producing countries, principally those in the Organization of Petroleum Exporting Countries (OPEC). Unlike the feedstock picture in the United States, ethane is expected to be the principal steam cracker feedstock for OPEC. Also, European plants using natural gas liquids from the North Sea are expected to be built.

The following tabulation indicates the feedstocks used to make ethylene in the United States in 1976 and the forecasts for 1980 (in percent): 2/

Feedstock	1976	1980
Ethane	46	40
Heavy liquids 1/	27	48
Propane	25	10
Butane	2	2
Total	100	100

1/ Naphtha and gas oil.

As this switch to heavier feedstocks progresses, increasing quantities of byproducts such as propylene, butadiene, benzene, toluene, and xylene will become available, and the steam cracker will increase in importance as a source of these chemicals. In addition, fuels and other similar refinery products will also be made. Since the economic viability of a heavy liquids steam cracker will depend to a considerable extent upon obtaining good prices for these byproducts, it is expected that petroleum companies, rather than chemical companies, will build most of the future heavy-liquids steam cracker capacity.

Currently, most petrochemical plants are located in the consuming nations; that is, production and consumption centers are essentially the same, whether the feedstocks are produced domestically or imported. This situation is similar to that of petroleum refineries being situated in the consuming countries. However, the likelihood is that in the future

1/ Chemical and Engineering News, Sept. 13, 1976, p. 11.
2/ Ibid., Apr. 18, 1977, p. 12.

a significant number of both petrochemical and refining facilities will be built in areas rich in feedstock rather than in the consuming areas. These facilities would be economically viable because of exports rather than local market sales. The result would be a separation of production and consumption centers with an increase in trade. To maintain security of supply in such a situation there could be a trend toward protectionism by some of the consuming centers and an increase in the use of trade as a political weapon by others.

World trade and patterns

The United States has been a leading chemical-exporting nation at least partially because of lower feedstock costs compared with those in Europe and Japan. The U.S. advantage is traceable to price-controlled domestic crude petroleum, while most of the other current petrochemical-producing nations are much more reliant on petroleum imports at world price. As the U.S. price approaches the world price under The National Energy Plan most of this advantage should disappear. 1/ U.S. exports to Europe and to third-world markets may decrease. 2/ Those U.S. products particularly involved include benzene, cyclohexane, and p-xylene.

Also working to reverse the position of U.S. exports in the future will be the expected buildup of petrochemical facilities in OPEC countries and Mexico designed primarily to supply export markets. In addition, the availability of ethane from the North Sea could decrease costs in Europe and make European production more competitive in world markets.

A comprehensive petrochemical investment plan recently unveiled by Petroleos Mexicanos if completely implemented could result in Mexico becoming a major exporter by the early 1980's. 3/ At the same time a massive buildup of Middle East petrochemical capacity is expected; the questions appear to be how massive and when it will be. Those chemicals that will probably be favored in this buildup are ethylene, ammonia, polyethylene, aromatics, polyvinyl chloride, and methanol. 4/ The following tabulation from a leading industry periodical indicates the share of forecasted 1990 demand in the United States, Western Europe and Japan that the announced 1990 Arab capacity would account for, as follows (in percent): 5/

Product	United States	Western Europe	Japan
Ethylene	18	16.6	52
Propylene	5	4	11.5
Butadiene	7.5	10	21.5
Benzene	6.5	9	16.5
o-Xylene	15	10	44
p-Xylene	8	19	19
Vinyl chloride	21.5	12.5	31.5
Styrene	16.5	12.5	31.5
Polyethylene, low density	27.8	12.5	89
Polyethylene, high density	14	17.5	58
Polypropylene	8	7.5	19

1/ Chemical and Engineering News, May 23, 1977, p.7.
2/ See "Organic Chemicals From Coal," p.10, for comments on the possibility of coal helping the United States remain a major organic exporter in the future.
3/ Oil and Gas Journal, Feb. 7, 1977, p. 36.
4/ Chemical Week, Mar. 23, 1977, p. 31.
5/ Hydrocarbon Processing, Dec., 1976, p. 116.

There is no unanimity among industry observers as to the competitive problems olefins (and derivatives) facilities using natural gas liquids from the North Sea and and OPEC countries could cause U.S. industry. This lack of unanimity is to a large extent due to differing assumptions as to the degree of host-country financial and subsidizing incentives that will be forthcoming to encourage such investment. It is generally accepted that under certain conditions such facilities could become competitive, particularly with new heavy-liquids steam cracker facilities in the United States. 1/ It has been indicated that the major advantages for the Middle East lie with those products that are energy intensive and have the lowest capital requirements. 2/ On the other hand, a leading foreign transporter of liquefied gases has forecast that olefins will be transported by refrigerated tankers from producing sites to countries around the world, where they would be made into the various derivatives. 3/

Aromatics manufacture in future export centers around the world is also possible, especially at those centers with refining capacity. The Middle East might be at a disadvantage because much of its crude petroleum lacks the large quantities of aromatics precursors found in crude petroleum from other geographic areas. In addition, gas-liquids steam crackers do not produce as byproducts the quantities of aromatics produced by heavy-liquids steam crackers. However, aromatics, being liquids, are more easily handled and transported than are the olefins. While ethylene and propylene would be among the most expensive chemicals to ship, benzene, toluene, and xylene would be relatively inexpensive. Accordingly, most of the Middle East countries do have active aromatics projects.

Probably the most attractive markets for exports from the Middle East and North Africa would be via the Suez Canal to--

(1) Europe via Mediterranean and North Sea ports,
(2) The U.S. east coast, and
(3) The U.S. gulf coast.

Movements to the east via the Strait of Malacca would most likely go to--

(1) Japan
(2) The U.S. west coast,
(3) South America via Capetown, and
(4) India. 4/

From the above it is obvious that the United States is a prime future export market for Middle East production. It would also be looked to as the prime market by producers in both Canada and Mexico. All of this is not surprising.

1/ Oil and Gas Journal, Mar. 21, 1977, p. 101.
2/ European Chemical News, Sept. 24, 1976, p. 30.
3/ Chemical Week, Dec. 8, 1976, p. 45.
4/ C. Van Den Brink, Middle East Petrochemical Logistics, Chemical Marketing Research Association Meeting, Houston, Tex., Feb. 11-14, 1975.

The United States is a favorably located, sophisticated market which will probably be beset by increasing domestic production costs, and as such would be expected to be attractive to those nations and companies seeking to increase exports. The outlook may seem unfavorable for the domestic petrochemical industry as a whole, although individual petrochemical companies may invest and produce in nations with favorable feedstock positions. The domestic organic chemical industry may also be aided by the large coal reserves and increasing production if economically favorable chemicals-from-coal processes can be implemented. 1/

1/ See "Organic Chemicals From Coal," p.10, of this report.

Selected organic chemicals: Rank in 1975 and 1976 and average annual growth rate, 1971-76 and 1966-71.

	Rank in list of all chemicals		Average annual growth rate	
	1975	1976	1966-71	1971-76
			Percent	Percent
Ethylene	5	5	10.4	4.0
Benzene	16	13	3.5	5.8
Propylene	13	14	8.1	7.8
Toluene, all grades	18	15	9.0	2.6
Xylene, all grades	21	18	13.6	4.5
Styrene	20	19	8.0	6.1
Ethylbenzene	19	21	9.0	3.0
Butadiene (1,3), rubber grade	31	30	2.7	1.0
p-Xylene	32	31	26.0	13.4
Cumene	37	33	19.1	4.8
Cyclohexane	39	37	(neg.)	4.6

Source: Ranks, from Chemical and Engineering News, May 2, 1977, p. 37; growth rates, based on data published annually in U.S. International Trade Commission, Synthetic Organic Chemicals: United States Production and Sales.

TABLE 1.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION: U.S. PRODUCTION AND SALES, 1975

[Listed below are the primary products from petroleum and natural gas for chemical conversion for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists separately all primary products from petroleum and natural gas for chemical conversion for which data on production and/or sales were reported and identifies the manufacturers of each]

CRUDE PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	112,873,340	59,083,390	5,489,485	$0.093
AROMATICS AND NAPHTHENES[2]				
Total	48,167,093	26,928,545	2,757,335	.102
Benzene (1° and 2°)	9,826,636	4,157,724	441,959	.106
Ethylbenzene	5,769,602	555,233	31,968	.058
Cyclohexane	2,186,581	2,017,387	265,082	.131
Cumene	2,715,832	1,397,184	169,572	.121
Naphthalene, all grades	562,645	448,844	94,376	.210
Naphthenic acid	44,433	13,507	1,949	.144
Styrene	6,301,397	2,753,814	541,843	.197
Toluene, all grades, total	7,138,997	4,396,984	329,734	.075
Nitration grade, 1°	6,154,715	3,852,323	291,122	.076
Pure commercial grade, 2°	581,285	...	...	...
All Other[3,4]	402,997	544,661	38,612	.070
Xylenes, mixed, total	5,475,932	5,421,041	351,851	.064
3° grade	2,235,028	2,525,802	140,854	.055
5° grade	2,619,776	2,238,675	165,160	.073
All other[4]	621,128	656,564	45,837	.069
o-Xylene	853,813	660,989	70,907	.107
p-Xylene	2,911,451	1,779,422	278,967	.157
All other aromatics and naphthenes[5]	4,379,774	3,326,416	179,127	.054
ALIPHATIC HYDROCARBONS				
Total	64,706,247	32,154,845	2,732,150	.085
C_2 hydrocarbons, total	30,841,877	13,562,471	1,021,836	.075
Acetylene[6]	304,181	...	...	...
Ethane	8,063,126	6,486,104	229,107	.035
Ethylene	22,474,570	7,076,367	792,729	.112
C_3 hydrocarbons, total	16,900,503	10,438,049	767,732	.073
Propane	6,870,042	5,992,081	436,784	.073
Propylene[7]	10,030,461	4,445,968	330,948	.074
C_4 hydrocarbons, total	10,447,313	4,789,154	576,332	.120
Butadiene and butylene fractions	1,398,731	406,743	35,670	.087
1,3-Butadiene, grade for rubber (elastomers)	3,507,295	2,188,720	387,018	.176
n-Butane	1,948,426	982,844	65,403	.066
1-Butene	61,424	47,175	7,249	.153
1-Butene and 2-butene, mixed[8]	1,157,915	109,069	10,770	.098
Isobutane	1,127,584	268,827	17,822	.066
Isobutylene, 2-butene and mixed butylenes	564,932	202,177	26,200	.129
All other[9]	681,006	583,599	26,200	.044
C_5 hydrocarbons, total	1,137,758	600,320	47,689	.079
Amylenes and pentenes	215,926	...	...	...
Isoprene (2-Methyl-1,3-butadiene)	341,261	122,146	14,339	.117
All other[10]	580,571	478,174	33,350	.070

See footnotes at end of table.

TABLE 1.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION: U.S. PRODUCTION AND SALES, 1976--CONTINUED

CRUDE PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
ALIPHATIC HYDROCARBONS--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
All other aliphatic hydrocarbons, derivatives, and mixtures, total	5,378,796	2,764,851	318,561	$0.115
Alpha olefins[11]	313,736	288,141	55,650	.193
Dodecene (Tetrapropylene)	302,110	115,058	14,781	.128
Polybutene	283,256	215,678	30,155	.140
Hexane	275,572	255,299	19,026	.074
Hydrocarbon derivatives[12]	264,797	247,741	33,646	.136
Nonene (Tripropylene)	260,247	128,303	10,107	.078
n-Paraffins, total[13]	1,489,312	988,721	69,993	.071
All other[14]	2,189,766	525,910	85,203	.162

[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 or sales of benzene, toluene, and xylene from all sources are given in tables 1 and 1B of the report "Tar and Tar Crudes."
[3] Includes toluene, solvent grade, 90 percent.
[4] Includes toluene and xylene used as solvents, as well as that which is blended in aviation and motor gasolines.
[5] Includes data for alkyl aromatics, crude cresylic acid, distillates, solvents, and miscellaneous cyclic hydrocarbons.
[6] Production figures on acetylene from calcium carbide for chemical synthesis are collected by the U.S. Bureau of the Census.
[7] Includes data for refinery propylene.
[8] The statistics represent principally the butene content of crude refinery gases from which butadiene is manufactured.
[9] Includes data for butanes, 1-butene, and mixed C_4 streams.
[10] Includes data for C_5 hydrocarbon mixtures, pentanes, and piperylenes.
[11] Includes data for the following molecular weight ranges: C_6-C_7; C_6-C_{10}; C_8-C_{10}; C_{10}-C_{16}; C_{11}-C_{15}; C_{12}-C_{14}; C_{14}-C_{16}; C_{15}-C_{20}; C_{16}-C_{18}; and C_{16}-C_{30}.
[12] Includes data for methyl, ethyl, propyl, butyl, octyl, nonyl, decyl, hexadecyl, and miscellaneous mercaptans, and other hydrocarbon derivatives.
[13] Includes data for following chain lengths: C_6-C_8; C_6-C_9; C_{10}-C_{14}; C_{10}-C_{16}; C_{15}-C_{17}; and others.
[14] Includes data for di-isobutylene, methane, octanes, mixtures of C_2 and C_3 hydrocarbons, triisobutylene, and other hydrocarbons, and sales of acetylene, heptene, C_9-C_{15} hydrocarbons, mixed heptenes and others.

TABLE 2.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS' IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AN "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
AROMATICS AND NAPHTHENES	
ALKYL AROMATICS:	
CYCLOSOLS	SHC.
ALKYL AROMATICS: ALL OTHER	ACC, MON.
@BENZENE:	
@BENZENE 1 DEGREE (99-100%) (E.G.,4.85 DEGREE C SOLIDIFYING POINT MINIMUM)	ACU, APF(E), APR, ASH, ATR, BRP, CCP, CPI, CSD, CSO, CSP, DOW(E), EKX, ENJ(E), GOC, GRS, HES, MOC, MON, PLC, PPR, SHC, SKO, SM(E), SNT(E), SOG, SUN(E), TOC, TX, UCC, UOC(E).
@BENZENE 2 DEGREE (98-98.9%)	SOC.
CRESYLIC ACID (LESS THAN 75 PERCENT DISTILLING OVER 215 DEGREES C)	PRD.
@CUMENE	ACC, ASH, CLK, CSP, DOW(E), GOC, MOC, MON, SKO, SNT(E), SOC, TX, UCC.
@CYCLOHEXANE	CSD, ENJ(E), GOC, GRS, PLC, PPR, SUN(E), SWC, TX, UOC(E).
CYCLOHEXENE (TETRAHYDROBENZENE)	PLC, TBO.
CYCLOPENTANE	PLC.
DICYCLOPENTADIENE (INCLUDING CYCLOPENTADIENE)	GOC, MON.
@ETHYLBENZENE	ACC, ATR, CSD, DOW(E), ELP, FG, KPP(E), KPT, MON, SNT(E), SOG, STY, TOC, UCC.
@NAPHTHALENE	ASH, COL, ENJ(E), MON, SUN(E), TID, UCC.
@NAPHTHENIC ACID:	
ACID NUMBER LESS THAN 150	ATR(E), SUN(E), TX.
ACID NUMBER 150-199	ATR(E), GOC, SOC, SUN(E).
ACID NUMBER 200-224	ATR(E), SOC.

TABLE 2.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED IDENTIFIED BY MANUFACTURER, 1976

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
AROMATICS AND NAPHTHENES--CONTINUED	
NAPHTHENIC ACID--CONTINUED	
ACID NUMBER 225-249	PRD.
PETROLEUM PHENOLS	SKO.
SODIUM CARBOLATE AND PHENATE, CRUDE	ATR.
@STYRENE	ACC, CSD, DOW(E), ELP, FG, GOC, KPP(E), MCB, MON, SHC, SNT(E), TX, UCC.
@TOLUENE ALL GRADES, TOTAL:	
@1 DEGREE (99.5-100%)	APP(E), ASH, ATR, CCP, CPI, CSD, ENJ(E), GOC, GRS, KPP(E), MOC, MON, PLC, PPR, SHC, SKO, SM(E), SNT(E), SOG, SUN(E), TOC, TX, UCC, UOC(E).
@2 DEGREE (98.5-99.4%)	ATR, DOW(E), ELP, HES, SHO.
@90-98.4% (NON-FUEL)	CSP, FG, MON, SKO.
@XYLENES, MIXED, TOTAL:	
@5 DEGREES (98-98.9%) (INCLUDE XYLENE BLENDED IN AVIATION AND MOTOR FUELS)	ATR, CPI, GOC, HES, MOC, SOC, SOG, STY.
@3 DEGREES (99-100%)	APP(E), CCP, CSO, ENJ(E), GRS, PPR, SHC, SUN(E), UCC, UOC(E).
90-97.9% (NON-FUEL)	ASH, CSP, MON, TOC.
@ORTHO-XYLENE (90-100% OF ORTHO-XYLENE ISOMER)	ATR, CPI, CSD, ENJ(E), MON, PPR, SHC, SNT(E), SOC, TOC.
@PARA-XYLENE (90-100% OF PARA-XYLENE ISOMER)	ACC, ATR, ENJ(E), HCR, PPR, SHC, SNT(E), SOC, SOG, TOC.
ALL OTHER AROMATICS AND NAPHTHENES:	
C9 AROMATICS	JCC, OMC, TX.
HYDROCARBON POLYMER	JCC.
POLYETHYLBENZENE	FG.
ALL OTHER PRODUCTS FROM PETROLEUM AND NATURAL GAS, CYCLIC	ACU, CBN, CO, CPI, EKX, ENJ(E), GOC, JCC, MOC, MON, NWP, SHC, SOG.
ALIPHATIC HYDROCARBONS	
C/1 HYDROCARBONS:	
METHANE	MOC, MON.
@C/2 HYDROCARBONS:	
@ACETYLENE (FOR CHEMICAL USE ONLY)	DOW(E), MNO, RH, UCC.
@ETHANE	ACU, DOW(E), ENJ(E), MOC, MON, OMC, PAN, PLC, PUE, SHO, SM, TX, UOC(E), USI.

TABLE 2.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED IDENTIFIED BY MANUFACTURER, 1976

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ALIPHATIC HYDROCARBONS--CONTINUED	
C/2 HYDROCARBONS--CONTINUED	
@ETHYLENE	ACC, ACU, AMO, ATR, BAS, BPG, CBN, CO, CPX, DOW(E), DUP, EKX, ELP, ENJ(E), GOC, JCC, KPP(E), MOC, MON, NWP, OMC, PLC, PUE, SHC, SM(E), SNO, TX, UCC, USI.
@C/3 HYDROCARBONS:	
@PROPANE (COMMERCIAL AND HD-5)	AMO, APR, ASH, ATR, CCP, COR, CPI, CSD, CSO, CSP, ENJ(E), GRS, MOC, OMC, PAN, PLC, PUE, SHO, SM, SNT(E), SOG, SUN(E), TX, UCC, UOC(E), USI.
@PROPYLENE	ACU, AMO, ASH, ATR, BPG, CBN, CLK(E), CO, CPX, CSD, CSO, DOW(E), DUP, EKX, ELP, ENJ(E), GOC, JCC, KPP(E), MOC, MON, NWP, OMC, PUE, SHC, SIO, SM(E), SNT(E), SOC, SOG, SUN(E), TX, UCC.
C2 AND C3 HYDROCARBONS, MIXED (SPECIFY)	MON.
@C/4 HYDROCARBONS:	
@1,3-BUTADIENE, GRADE FOR RUBBER (ELASTOMERS)	ATR, BPG, CPY, DOW(E), ELP, ENJ(E), PRS, MON, PLC, PTT, PUE, SHC, SM(E), TUS, UCC.
@BUTADIENE AND BUTYLENE FRACTIONS	ACC, ACU, ATR, CO, CPX, DOW(E), EKX, GOC, UCC.
@N-BUTANE	APP(E), APR, COR, CSD, CSP, MOC, OMC, PLC, SHO, SM, SNT(E), SUN(E), UCC, USI.
1-BUTENE	GOC, PLC, PTT.
2-BUTENE	MON.
@1-BUTENE AND 2-BUTENE, MIXED	AMO, CSO, DOW(E), ENJ(E), GOC, MOC, PTT, SHC, UCC.
@ISOBUTANE (2-METHYLPROPANE)	AMO, CSP, ELP, ENJ(E), MOC, OMC, SHO, SM, SUN(E), TBO, TX, UCC, USI.
@ISOBUTYLENE (2-METHYLPROPENE)	ENJ(E), OCC, PLC, PTT, SHC.
C4 FRACTION	BPG, JCC.
C4 HYDROCARBONS: ALL OTHER	ENJ(E), MON, SM(E), USI.
@C/5 HYDROCARBONS:	
DIBUTANIZED AROMATIC CONCENTRATE	CPX, DUP.
ISOPENTANE (2-METHYLBUTANE)	PLC.
@ISOPRENE (2-METHYL-1,3-BUTADIENE)	BPG, ENJ(E), MON, SHC.
N-PENTANE	APR, MOC.
@PENTENES, MIXED	MON, PUE, TX.
C5 HYDROCARBONS: ALL OTHER	BPG, MON, PLC, SHC, UCC.

TABLE 2.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED IDENTIFIED BY MANUFACTURER, 1976

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ALIPHATIC HYDROCARBONS--CONTINUED	
ALL OTHER ALIPHATIC HYDROCARBONS, DERIVATIVES, AND MIXTURES:	
C/6 HYDROCARBONS:	
C5-C6 MIXTURES	COR.
@HEXANE	APR, ENJ(E), HMY, SOG, UOC(E).
C6 HYDROCARBONS: ALL OTHER	SWC.
C/7 HYDROCARBONS:	
N-HEPTANE	EKX, SOG.
HEPTENES, MIXED	ACC, ENJ(E), TID.
C7 HYDROCARBONS: ALL OTHER	APR, CPI, ENJ(E), UOC(E).
C/8 HYDROCARBONS:	
DI-ISOBUTYLENE (DI-ISOBUTENE)	PTT, TX.
N-OCTANE	SOG.
C8 HYDROCARBONS: ALL OTHER	ENJ(E), TID.
C/9 AND ABOVE HYDROCARBONS (EXCEPT ALPHA OLEFINS):	
@1-DODECENE (TETRAPROPYLENE)	CO, ENJ(E), HMY, SOC, SUN(E), TX, UOC(E).
EICOSANE	HMY.
@NONENE (TRIPROPYLENE)	ATR, ENJ(E), SUN(E), TID, UOC(E).
@ALPHA OLEFINS:	
C16-C30 HYDROCARBONS	GOC.
C11-C15	GOC, SOC.
C6-C7	GOC, SHC, SOC.
C8-C10	GOC, SOC.
ALPHA OLEFINS: ALL OTHER	SOC, TNA(E).
@N-PARAFFINS - CARBON CHAIN LENGTH:	
C6-C9	SOG, UCC.
C10-C14	ENJ(E), SOG, UCC.
C9-C15	BFG, SOG.
N-PARAFFINS: OTHER	CO, ENJ(E), GOC.
@POLYBUTENE	ACC, CSD, SOC.
TRI-ISOBUTYLENE	PTT.
C5-C9 MIXTURE	PPR.
@HYDROCARBON DERIVATIVES:	
TERT-BUTYL MERCAPTAN (2-METHYL-2-PROPANETHIOL)	PAS, PLC.
DI-TERT-BUTYL DISULFIDE	PLC.
ETHYL MERCAPTAN (ETHANOLTHIOL)	PAS, PLC.
METHYL MERCAPTAN (METHANETHIOL)	DOW(E), PAS.

TABLE 2.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED IDENTIFIED BY MANUFACTURER, 1976

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ALIPHATIC HYDROCARBONS--CONTINUED	
ALL OTHER ALIPHATIC HYDROCARBONS, DERIVATIVES, AND MIXTURES	
@HYDROCARBON DERIVATIVES--CONTINUED	
TERT-OCTYL MERCAPTAN	PAS.
N-PROPYL MERCAPTAN (1-PROPANETHIOL)	PAS, PLC.
N-BUTYL MERCAPTAN	PLC.
S-BUTYL MERCAPTAN	PLC.
@HYDROCARBON DERIVATIVES: ALL OTHER HYDROCARBON DERIVATIVES	ACC, CBN, EKX, PAS, TX.
@ALL OTHER, INCLUDING MIXTURES	ATR, CO, CSO, ENJ(E), SOC.

TABLE 1.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION: DIRECTOR OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of primary products from petroleum and natural gas for chemical conversion to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
ACC	Amoco Chemicals Corp.
ACU	Allied Chemical Corp., Union Texas Petroleum Div.
AIP	Air Products & Chemicals, Inc.
AMO	Amoco Oil Co.
AMO	Amoco Texas Refining Co.
APF	American Petrofina Co. of Texas
APR	Atlas Processing Co.
ASH	Ashland Oil, Inc.
ATR	Atlantic Richfield Co.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Co. Div.
BRP	BP Oil, Inc.
CBN	Cities Service Co., Petrochemical Div.
CCP	Crown Central Petroleum Corp.
CLK	Clark Chemical Co.
CO	Continental Oil Co.
COL	Collier Carbon & Chemical Corp.
COR	Commonwealth Oil & Refining Co., Inc.
CPI	Commonwealth Petrochemicals, Inc.
CPX	Chemplex Co.
CPY	Copolymer Rubber & Chemical Corp.
CSD	Cosden Oil & Chemical Corp.
CSO	Cities Service Co.
CSP	Coastal States Petrochemical Co.
DOW	Dow Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc.
EKX	Eastman Kodak Co., Texas Eastman Co. Div.
ELP	El Paso Products Co.
ENJ	Exxon Chemical Co. U.S.A.
FG	Foster Grant Co., Inc.
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.
GOC	Gulf Oil Corp., Gulf Oil Chemicals Co.-U.S.
GRS	Champlin Petroleum Co.
HCR	Hercor Chemical Corp.
HES	Amerada Hess Corp. (Hess Oil Virgin Islands Corp.)
HMY	Humphrey Chemical Co.
JCC	Jefferson Chemical Co., Inc.
KPP	Arco/Polymers, Inc.
KPT	
MCB	Borg-Warner Corp., Borg-Warner Chemicals
MNO	Monochem, Inc.
MOC	Marathon Oil Co., Texas Refining Div.
MON	Monsanto Co.
NWP	Northern Petrochemical Co.
OCC	Oxirane Chemical Co.
OMC	Olin Corp.
PAN	Amoco Production Co.
PAS	Pennwalt Corp.
PLC	Phillips Petroleum Co.
PPR	Phillips Puerto Rico Core, Inc.
PRD	Ferro Corp., Productol Chemical Div.
PTT	Petro-Tex Chemical Corp.
PUE	Puerto Rico Olefins Co.
RH	Rohm & Haas Co.
SHC	Shell Oil Co., Shell Chemical Co. Div.
SHO	Shell Oil Co.
SIO	Standard Oil Co. (Ohio).
SKO	Getty Refining & Marketing Co.
SM	Mobil Oil Corp. & Mobil Chemical Co.
SNO	SunOlin Chemical Co.
SNT	Suntide Refining Co.
SOC	Standard Oil Co. of California, Chevron Chemical Co.
SOG	Charter International Oil Co.
STY	Styrochem Corp.
SUN	Sun Oil Co.
SWC	Corco Cyclohexane, Inc.
TBO	Tauber Oil Co.
TID	Getty Refining & Marketing Co.
TNA	Ethyl Corp.
TOC	Tenneco Oil Co.
TUS	Texas-U.S. Chemical Co.
TX	Texaco, Inc.
UCC	Union Carbide Corp.
UOC	Union Oil Co. of California
USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co.
VEL	Velsicol Chemical Corp.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

CYCLIC INTERMEDIATES

Roger Adams

Cyclic intermediates are synthetic organic chemicals derived principally from petroleum and natural gas and from coal-tar crudes produced by destructive distillation (pyrolysis) of coal. Most cyclic intermediates are used in the manufacture of more advanced synthetic organic chemicals and finished products, such as dyes, medicinal chemicals, elastomers (synthetic rubber), pesticides, and plastics and resin materials. Some intermediates, however, are sold as end products without further processing. For example, refined naphthalene may be used as a raw material in the manufacture of 2-naphthol or of other more advanced intermediates, or may be packaged and sold as a moth repellant or as a deodorant. In 1976 about 39 percent of the total output of cyclic intermediates was sold; the rest was consumed chiefly by the producing plants in the manufacture of more advanced intermediates and finished products.

Total product of cyclic intermediates in 1976 amounted to 19,796 million pounds. Sales of cyclic intermediates in 1976 were 7,664 million pounds, valued at $2,387 million. These totals cannot be compared with 1975 figures because several items were transferred to the primary products from petroleum and natural gas section.[1]

Intermediates whose production exceeded 1 billion pounds in 1976 were dimethyl terephthalate (7,211 million pounds), and phenol (2,121 million pounds). Other large-volume intermediates produced in 1976 were isocyanates (948 million pounds), phthalic anhydride (902 million pounds), cyclohexanone (641 million pounds), aniline (544 million pounds), dodecylbenzene (529 million pounds), bisphenol A (449 million pounds), nitrobenzene (409 million pounds), 2,4 (and 2,6)-dinitrotoluene (396 million pounds), monochlorobenzene (329 million pounds), and 2,4-dinitrotoluene (328 million pounds). The 12 chemicals noted above accounted for 75 percent of the total output of intermediates in 1976.

---

[1] Items transferred from cyclic intermediates to primary products from petroleum and natural gas are ethylbenzene, cyclohexane, styrene, m-xylene, o-xylene, p-xylene, and cumene.

TABLE 1.--Cyclic intermediates: U.S. production and sales, 1976

[Listed below are all cyclic intermediates for which any reported data on production and/or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists alphabetically all cyclic intermediates on which data on production and/or sales were reported and identifies the manufacturers of each]

CYCLIC INTERMEDIATES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	19,795,832	7,663,691	2,386,993	$0.31
Acetoacetanilide	...	3,867	2,759	.71
o-Acetoacetanisidide	...	1,077	1,785	1.66
o-Acetoacetotoluidide	...	723	738	1.02
4'-Aminoacetanilide (Acetyl-p-phenylenediamine)	366	...	...	...
4-Amino-4'-nitro-2,2'-stilbendisulfonic acid	134	...	...	...
p-[(p-Aminophenyl)azo]benzenesulfonic acid	411	...	...	...
Aniline (Aniline oil)	543,779	156,696	42,895	.27
Anilinomethanesulfonic acid and salt	466	...	...	...
Benzaldehyde, tech	8,285	8,772	5,124	.58
Benzoic acid, tech	79,654	32,956	7,561	.23
2-Benzothiazolethiol, sodium salt	...	3,012	1,912	.63
Biphenyl	56,894	14,438	4,073	.28
Chlorobenzene, mono-	329,072	67,895	16,786	.25
4-Chloro-3-nitrobenzenesulfonamide	697	...	...	...
4-Chloro-3-nitrobenzenesulfonyl chloride	524	...	...	...
Cresols, total[2]	100,211	95,186	44,876	.47
o-Cresol	22,187	20,731	8,785	.42
All other[3]	78,024	74,455	36,091	.48
Cresylic acid, refined[2]	57,107	31,114	11,814	.38
Cyclohexanone	640,794	...	...	...
Cyclohexylamine	...	6,045	4,327	.72
1,4-Diamino-2,3-dihydroanthraquinone	531	...	...	...
o-Dichlorobenzene	48,594	24,116	6,999	.29
p-Dichlorobenzene	36,699	37,460	8,545	.23
2,4-Dichlorophenol	...	4,389	2,444	.56
Dicyclohexylamine	...	686	570	.83
N,N-Diethylaniline	1,991	1,336	1,350	1.01
9,10-Dihydro-9,10-dioxo-1-anthracenesulfonic acid and salt (Gold salt)	1,073	...	...	...
1,4-Dihydroxyanthraquinone (Quinizarin)	1,717	167	344	2.06
2,4-Dihydroxybenzophenone	304	...	...	...
1,8-Dihydroxy-4,5-dinitroanthraquinone	251	...	...	...
N,N-Dimethylaniline	13,560	8,124	4,601	.57
N,N-Dimethylbenzylamine	184	109	198	1.82
N,N-Dimethylcyclohexylamine	4,028	3,889	4,283	1.10
4,4'-Dinitrostilbene-2,2'-disulfonic acid	11,089	...	...	...
2,4-Dinitrotoluene	327,983	...	...	...
2,4 (and 2,6)-Dinitrotoluene	396,359	...	...	...
Dodecylbenzene	528,681	418,109	105,523	.25
N-Ethylaniline, refined	1,049	910	830	.91
2-(N-Ethylanilino)ethanol	291	...	...	...
Hydroquinone, tech, grade	...	10,287	17,299	1.68
Isocyanic acid derivatives, total	948,277	848,840	362,280	.43
Polymethylene polyphenylisocyanate	312,548	259,273	115,037	.44
Toluene-2,4- and 2,6-diisocyanate (80/20 mixture)	563,752	532,582	201,431	.38
Other isocyanic acid derivatives	71,977	56,985	45,812	.80
4,4'-Isopropylidenediphenol (Bisphenol A)	448,832	113,192	41,470	.37
Melamine	126,246	80,119	26,781	.33
DL-p-Mentha-1,8-diene	11,173	6,078	798	.13
Metanilic acid (m-Aminobenzenesulfonic acid)	1,594	...	...	...
4,4'-Methylenedianiline	...	1,174	1,716	1.46
3-Methyl-1-phenyl-2-pyrazolin-5-one (Developer Z)	...	13	29	2.23
α-Methylstyrene	61,363	48,178	7,363	.15
3'-Nitroacetanilide	36	...	...	...

See footnotes at end of table.

TABLE 1.--CYCLIC INTERMEDIATES: U.S. PRODUCTION AND SALES, 1976--CONTINUED

CYCLIC INTERMEDIATES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Nitrobenzene	409,023	19,544	4,521	$0.23
5-Nitro-o-toluenesulfonic acid [SO H-1]	7,400	...	...	...
Nonylphenol	77,974	35,751	10,729	.30
1-[(7-Oxo-7H-benz[de]anthracene-3-yl)amino]anthraquinone	238	...	...	...
Phenol, total[2]	2,121,434	969,277	214,580	.22
From cumene	1,926,403	890,798	195,560	.22
Other	195,031	78,479	19,020	.24
2,2'-[(Phenyl)imino]diethanol (N-phenyldiethanolamine)	497	302	200	.66
Phthalic anhydride	902,382	528,789	118,136	.22
2-Picoline (α-Picoline)[3]	416	425	401	.94
Piperidine	509	...	...	...
Salicylaldehyde	4,414	2,864	7,173	2.50
Salicylic acid, tech. grade	31,265	3,968	3,298	.83
Terephthalic acid, dimethyl ester[4]	7,210,613	...	...	...
Toluene-2,4-diamine (4-m-Tolylenediamine)	233,103	...	...	...
7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid] (J Acid urea)	338	...	...	...
All other cyclic intermediates	4,005,927	4,073,814	1,289,882	.32

[1] Calculated from rounded figures.
[2] Does not include data for coke ovens and gas-retort ovens, reported to the Division of Fuels Data, U.S. Bureau of Mines.
[3] Figures include (o,m,p)-cresol from coal tar and some m-cresol and p-cresol.
[4] The figures for terephthalic acid, dimethyl ester (DMT) include both the acid itself and the dimethyl ester.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AND "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
8-ACETAMIDO-1-(4-ACETAMIDO-2-HYDROXY-5-NITROPHENYLAZO)-2-NAPHTHOL	TRC.
3-*(2-ACETAMIDO-4-AMINOPHENYL)AZO*-1,5-NAPHTHALENEDISULFONICACID	TRC.
2,2'-*(5-ACETAMIDO-2-ETHOXYPHENYL)IMINO*DIETHANOL	EKT, TCH.
ACETANILIDE, TECH.	ARA, SAL.
ACETANILIDE N.F.	SAL.
PARA-ACETANISIDIDE	EKT.
ACETIC ACID, PHENYL ESTER	DGO.
@ACETOACETANILIDE	EKT, FMP(E), HST.
@ORTHO-ACETOACETANISIDIDE	EKT, FMP(E), HST.
@ORTHO-ACETOACETOTOLUIDIDE	EKT, FMP(E), HST.
2',4'-ACETOACETOXYLIDIDE	HST.
3-ACETAMIDO-N-(2-SUCCINIMIDOETHYL)-N-ETHYLANILINE	EKT.
1'-ACETONAPHTHONE	GIV.
ACETONE PHENYLHYDRAZONE	DUP.
ACETOPHENONE, CRUDE	ACS.
ACETOPHENONE, TECH.	CLK, SKO, UCC.
PARA-ACETOTOLUIDIDE	EK.
N-ACETYLANTHRANILIC ACID	DGO, SW(E).
PARA-ACETYLBENZENESULFONAMIDE	LIL.
PARA-ACETYLBENZENESULFONIC ACID, SODIUM SALT	LIL.
PARA-ACETYLBENZENESULFONYLURETHANE	LIL.
N-ACETYLSULFANILYL CHLORIDE	ACY, ARA.
ALKYLBENZENES:	
ALKYLBENZENE ALL OTHER (EXCEPT DODECYL, TRIDECYL AND STRIGHT-CHAIN)	UCC, WTC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ALKYLBENZENES:	
ALKYLBENZENE STRAIGHT-CHAIN (EXCEPT DODECYL AND TRIDECYL)	MON, WTC.
DODECYLBENZENE (INCLUDING TRIDECYLBENZENE):	
@DODECYLBENZENE, STRAIGHT-CHAIN	CO, MON, UCC, WTC.
DODECYLBENZENE, OTHER-	CO, SOC, WTC.
3'-AMINOACETANILIDE-	DGO, TRC.
@4'-AMINOACETANILIDE (ACETYL-PARA-PHENYLENEDIAMINE)	GAF, SAL, TRC.
3'-AMINO-PARA-ACETANISIDIDE-	EKT.
3'-AMINOACETOPHENONE	DUP, MON.
5-AMINO-2-(PARA-AMINOANILINO)BENZENESULFONIC ACID-	TRC.
2-(PARA-AMINOANILINO)-5-NITROBENZENESULFONIC ACID-	TRC.
3-AMINO-PARA-ANISANILIDE	PCW.
1-AMINOANTHRAQUINONE AND SALT-	ACY, TRC.
6-AMINO-3,4'-AZODIBENZENESULFONIC ACID (C.I. ACID YELLOW 9)	TRC.
PARA-AMINOBENZAMIDE-	SAL.
1-AMINO-4-BENZAMIDOANTHRAQUINONE	ACY, TRC.
7-(PARA-AMINOBENZAMIDO)-4-HYDROXY-2-NAPHTHALESULFONIC ACID-	TRC.
ORTHO-AMINOBENZENETHIOL-	FMT.
PARA-AMINOBENZOIC ACID, TECH.-	PD, SAL.
2-AMINO-6-BENZOTHIAZOLLCARBOXYLIC ACID	DUP.
1-AMINO-4-BROMO-9,10-DIHYDRO-9,10-DIOXO-2-ANTHRACENESULFONIC ACID AND SODIUM SALT	AC(E), TRC.
1-AMINO-2-BROMO-4-HYDROXYANTHRAQUINONE	ACY, DUP, VPC.
1-AMINO-2-BROMO-4-PARA-TOLUIDINOANTHRAQUINONE-	TRC.
1-AMINO-5-CHLOROANTHRAQUINONE-	TRC.
2-AMINO-1-CHLOROANTHRAQUINONE-	DUP.
4-AMINO-6-CHLORO-META-BENZENEDISULFONAMIDE	NES.
4-AMINO-6-CHLORO-META-BENZENEDISULFONAMIDE HYDROCHLORIDE	ABB.
2-AMINO-6-CHLOROBENZOTHIAZOLE HYDROCHLORIDE-	DUP.
1-AMINO-2-CHLORO-4-HYDROXYANTHRAQUINONE-	TRC.
2-AMINO-6-CHLOROPYRAZINE	ACY.
3-AMINO-6-CHLOROPYRIDAZINE	ACY.
2-AMINO-5-CHLORO-PARA-TOLUENESULFONIC ACID *SO/3H=1*	ACY, HSC.
6-AMINO-4-CHLORO-META-TOLUENESULFONIC ACID *SO/3H=1*	ACY, DUP, HSC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
2-AMINO-PARA-CRESOL	TRC.
1-AMINO-2,4-DIBROMOANTHRAQUINONE	DUP, TRC, VPC.
1-AMINO-2,4-DICHLOROANTHRAQUINONE	TRC.
2-AMINO-5,6-DICHLOROBENZOTHIAZOLE	SAL.
1-AMINO-9,10-DIHYDRO-9,10-DIOXO-4-PARA-TOLUENESULFONAMIDO-2-ANTHRACENESULFONIC ACID, SODIUM SALT	TRC.
5-AMINO-4,5'-DIHYDROXY-3,4'-*(2-METHOXY-5-METHYL-PARA-PHENYLENE)BIS(AZO)*-DI-2,7-NAPHTHALENEDISULFONIC ACID, 5'-BENZENESULFONATE	TRC.
3-AMINO-9-ETHYLCARBAZOLE	SDC.
4-AMINO-N-ETHYL-N-(BETA-METHYLSULFONAMIDOETHYL)-META-TOLUIDINEPHOSPHATE	WAY.
4-AMINO-5-HYDROXY-2,7-NAPHTHALENEDISULFONIC ACID, BENZENESULFONATE	TRC.
4-AMINO-5-HYDROXY-2,7-NAPHTHALENEDISULFONIC ACID, MONOSODIUM SALT	ACS.
4-AMINO-3-HYDROXY-1-NAPHTHALENESULFONIC ACID	ACY, TRC.
6-AMINO-4-HYDROXY-2-NAPHTHALENESULFONIC ACID, SODIUM SALT	TRC.
7-AMINO-4-HYDROXY-2-NAPHTHALENESULFONIC ACID, SODIUM SALT	AC(E), TRC.
3-AMINO-2-HYDROXY-5-NITROACETANILIDE	TRC.
2-(2-AMINO-5-HYDROXY-7-SULFO-1-NAPHTHYLAZO)-5-NITROBENZOIC ACID	TRC.
3-AMINO-4-METHOXYBENZENESULFONIC ACID	EK.
5-AMINO-6-METHOXY-2-NAPHTHALENESULFONIC ACID	TRC.
META-*(4-AMINO-3-METHOXYPHENYL)AZO*BENZENESULFONIC ACID	AC(E), TRC.
2-AMINO-4-METHOXYTOLUENE	HST.
4-*(4-AMINO-5-METHOXY-ORTHO-TOLYL)AZO*-4-HYDROXY-2,7-NAPHTHALENEDISULFONIC ACID, BENZENESULFONATE	TRC.
3-(4-AMINO-5-METHOXY-ORTHO-TOLYLAZO)-1,5-NAPHTHALENEDISULFONIC ACID	TRC.
7-*(4-AMINO-5-METHOXY-ORTHO-TOLYL)AZO*-1,3-NAPHTHALENEDISULFONIC ACID	TRC.
3-AMINO-4-METHYLBENZAMIDE	SAL.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-AMINO-4'-(3-METHYL-5-OXO-2-PYRAZOLIN-1-YL)-2,2'-STILBENEDISULFONIC ACID	TRC.
2-AMINO-6-METHYLPYRIDINE	RIL(E).
2-AMINO-4-(METHYLSULFONYL)PHENOL	TRC.
2-AMINO-6-(METHYLSULFONYL)BENZOTHIAZOLE	EKT.
2-AMINO-5-METHYL-1,3,4-THIADIAZOLE	ACY.
2-AMINO-1,5-NAPHTHALENEDISULFONIC ACID	ACY, SDH.
3-AMINO-1,5-NAPHTHALENEDISULFONIC ACID	TRC.
6-AMINO-1,3-NAPHTHALENEDISULFONIC ACID (AMINO I ACID)	AC(E), TRC.
7-AMINO-1,3-NAPHTHALENEDISULFONIC ACID	AC(E), DUP, TRC.
1-AMINO-2-NAPHTHALENESULFONIC ACID (ORTHO-NAPHTHIONIC ACID)	DUP.
2-AMINO-1-NAPHTHALENESULFONIC ACID	ACY, SW(E).
6-AMINO-2-NAPHTHALENESULFONIC ACID	TRC.
2-AMINONAPHTHALENE-4,6,8-TRISULFONIC ACID	TRC.
7-AMINO-1,3,6-NAPHTHALENETRISULFONIC ACID	AC(E).
8-AMINO-2-NAPHTHOL	BUC, TRC.
2-(2-AMINO-1-NAPHTHYLAZO-4-(1,1,3,3-TETRAMETHYLBUTYL))PHENOL	GAF.
2-AMINO-6-NITROBENZOTHIAZOLE	SAL.
@4-AMINO-4'-NITRO-2,2'-STILBENEDISULFONIC ACID	AC(E), GAF, TRC.
2-AMINO-5-NITROTHIAZOLE	PCW.
3-AMINO-2-OXAZOLIDINONE	NOR.
6-AMINOPENICILLANIC ACID	WYT.
ORTHO-AMINOPHENOL	SDC.
PARA-AMINOPHENETYL ALCOHOL	EKT.
PARA-AMINOPHENOL	ARA, MAL, SDC.
META-*(PARA-AMINOPHENYL)AZO*BENZENESULFONIC ACID	TRC.
@PARA-*(PARA-AMINOPHENYL)AZO*BENZENESULFONIC ACID	ACY, DUP, TRC.
7-(4-AMINOPHENYLAZO)-1,3-NAPHTHALENEDISULFONIC ACID	TRC.
5-*(PARA-AMINOPHENYL)AZO*SALICYLIC ACID	TRC.
2-(PARA-AMINOPHENYL)-6-METHYL-7-BENZOTHIAZOLESULFONIC ACID AND SALT	DUP, TRC.
1-(META-AMINOPHENYL)-5-OXO-2-PYRAZOLINE-3-CARBOXYLIC ACID	TRC.
2-AMINOPYRIDINE	NEP, RIL(E).

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-AMINOPYRIDINE	RIL(E).
2-AMINOPYRIMIDINE	ACY.
3-AMINO-PARA-TOLUAMIDE	SDH.
ALPHA-AMINO-PARA-TOLUENESULFONAMIDE	SDW.
4-AMINO-META-TOLUENESULFONIC ACID *SO/3H=1*	ACY, DUP.
6-AMINO-META-TOLUENESULFONIC ACID *SO/3H=1*	DUP, HSC.
META-(4-AMINO-3-TOLYAZO) BENZENESULFONIC ACID	TRC.
7-(4-AMINO-ORTHO-TOLYLAZO)-1,3-NAPHTHALENEDISULFONIC ACID	TRC.
3-*(4-AMINO-ORTHO-TOLYL) AZO*-1,5-NAPHTHALENEDISULFONIC ACID	TRC.
5-AMINO-2,4-XYLENESULFONIC ACID	DUP.
2-AMYLANTHRAQUINONE TECH.	DUP.
@ANILINE (ANILINE OIL)	ACY, DUP, FST, MAL, MOB(E), RUC, UPJ, USR.
ANILINE HYDROCHLORIDE	ACY.
2-ANILINOETHANOL	MIL, TCH.
7-ANILINO-4-HYDROXY-2-NAPHTHALENESULFONIC ACID	TRC.
@ANILINOMETHANESULFONIC ACID AND SALT	ACY, DUP, TRC, VPC.
8-ANILINO-1-NAPHTHALENESULFONIC ACID (PHENYL PERI ACID)	SDC.
ORTHO-ANISALDEHYDE	ASL.
ORTHO-ANISIDINE	AC(E), DUP.
PARA-ANISIDINE	DUP.
ORTHO-ANISIDINOMETHANESULFONIC ACID	AC(E), GAF, TRC.
ANISOLE, TECH.	DUP, GIV, OPC.
ANTHRANILIC ACID	SW(E).
ANTHRAQUINONE, 100%	TRC.
N,N'-(1,5-ANTHRAQUINONYLENE) DIANTHRANILIC ACID	TRC.
4',4'''-AZOBIS*4-BIPHENYLCARBOXYLIC ACID*	DUP.
@BENZALDEHYDE, TECH.	HN, KLM, MNR, UOP.
1-BENZAMIDO-4-BROMOANTHRAQUINONE	AC(E).
1-BENZAMIDO-5-CHLOROANTHRAQUINONE	TRC.
4-BENAMIDO-5-HYDROXY-2,7-NAPHTHENEDISULFONIC ACID	TRC.
7-BENZAMIDO-4-HYDROXY-2-NAPHTHALENESULFONIC ACID	TRC.
BENZANILIDE	DUP.
7H-BENZ*DE*ANTHRACEN-7-ONE	AC(E), ACY, DUP, TRC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
BENZENESULFONIC ACID	UPF.
BENZENESULFONIC ACID, PROPYL ESTER	CWN.
1,2,4,5-BENZENETETRACARBOXYLIC-1,2:4,5-DIANHYDRIDE	DUP.
1,2,4-BENZENETRICARBOXLIC ACID 1,2-ANHYDRIDE (TRIMELLITIC ANHYDRIDE)	ACC.
BENZHYDROL	UOP.
BENZIDINE BASE	ACS.
BENZILIC ACID	LEM.
@BENZOIC ACID, TECH.	HN, KLM, PFZ, VEL.
BENZOIN	SFS.
BENZOIN ISOBUTYL ETHER	SFS.
BENZOIN ISOPROPYL ETHER	SFS.
BENZONITRILE	VEL.
@2-BENZOTHIAZOLETHIOL, SODIUM SALT	ACY, GYR, USR.
1H-BENZOTRIAZOLE	SW(E).
2H-3,1-BENZOXAZINE-2,4(1H)-DIONE	SW(E).
2-BENZOXAZOLETHIOL	EK.
ORTHO-BENZOYLBENZOIC ACID	ACY, DUP, GAF.
BENZOYL CHLORIDE	HK, VEL.
BENZYLAMINE	ARS, MLS.
BENZIL	LEM.
BENZYL ETHER (DIBENZYL ETHER)	UOP.
3-(BENZYLETHYLAMINO)ACETANILIDE	EKT.
4,4'-BENZYLIDENEDI-ORTHO-TOLUIDINE	ACY.
6-BENZYLIDINEAMINOPENICILLANIC ACID, TERTIARY OCTYLAMINE SALT	TRD.
6'-N-BENZYLOXYCARBONYL-TRI-N-SALICYLYDENE KANAMYCIN A	X.
1-BENZYL-4-PHENYLISONIPECOTIC ACID	SDW.
1-BENZYL-4-PHENYLISONIPECOTONITRILE	SDW.
BENZYLTRIMETHYLAMMONIUM CHLORIDE	MLS.
*4,4'-BI-7H-BENZ*DE*ANTHRACENE*-7,7'-DIONE	ACY, DUP.
@BIPHENYL	CHL, DOW, GOC, MON, SNT(E).
N-N-BIS CYANOETHYLANILINE	DUP.
3'-*BIS(2-ACETOXYETHYL)AMINO*-PARA-ACETONISIDIDE	EKT, TCH.
BIS(PARA-AMINOCYCLOHEXYL)METHANE	DUP.
1,4-BIS*1-ANTHRAQUINONYLAMINO*ANTHRAQUINONE	DUP, TRC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
1,4-BIS*1-ANTHRAQUINONYLAMINO*ANTHRAQUINONE AND 1,4-BIS*5-CHLORO-1-ANTHRAQUINONYLAMINO*ANTHRAQUINONE (MIXED)	TRC.
1,5-BIS*1-ANTHRAQUINONYLAMINO*ANTHRAQUINONE-	TRC.
2,6-BIS(PARA-AZIDOBENZYLIDENE)-4-METHYLCYCLOHEXANONE	X.
ALPHA-ALPHA-BIS(3,5-DIBROMO-4-HYDROXY-ORTHO-TOLY)-ALPHA-HYDROXY-ORTHO-TOLUENESULFONIC ACID, SODIUM SALT	EK.
4,4'-BIS*DIETHYLAMINO*BENZHYDROL SALT, 2,7-NAPHTHALENEDISULFONIC ACID MIXTURE	TRC.
4,4'-BIS*DIETHYLAMINO*BENZOPHENONE (ETHYL KETONE BASE)	SDH.
4-BIS*(PARA-DIETHYLAMINOPHENYL)METHYL*-2,7-NAPHTHALENEDISULFONIC ACID, LEUCO FORM	TRC.
4,4'-BIS*DIMETHYLAMINO*BENZHYDROL (MICHLER'S HYDROL)	X.
4,4'-BIS*DIMETHYLAMINO*BENZOPHENONE (MICHLER'S KETONE)	X.
BIS(BETA-DIMETHYLAMINOETHYL)PHENYLACETONITRILE	WYT.
1,5-BIS*2,4-DINITROPHENOXY*-4,8-DINITROANTHRAQUINONE	VPC.
3'-*BIS(2-HYDROXYETHYL)AMINO*ACETANILIDE	GAF.
3'-*BIS(2-HYDROXYETHYL)AMINO*BENZANILIDE, DIACETATE ESTER	TCH.
3'-*BIS(2-HYDROXYETHYL)AMINO*-4'-METHOXYACETANILIDE-	EKT.
4,4'-BIS*(PARA-HYDROXYPHENYL)AZO*-2,2'-STILBENEDISULFONIC ACID (C.I. DIRECT YELLOW 4)	TRC.
BIS-(ORTHO-NITROPHENYL)SULFIDE	X.
2,4-BIS(XYLYLAZO) RESORCINOL	DUP.
PARA-BROMOANILINE-	EK.
PARA-BROMOANISOLE-	OPC.
3-BROMO-7H-BENZ*DE*ANTHRACEN-7-ONE (3-BROMOBENZANTHRONE)	ACY, DUP.
6-BROMO-5-CHLOROBENZOXAZOLONE-	SW(E).
2-BROMO-6-CHLORO-4-NITROANILINE-	HST.
2-BROMO-4,6-DINITROANILINE	AC(E), HST, SDC.
BROMOETHYLBENZENE-	RSA.
2-BROMO-4'-NITROACETOPHENONE	GAF.
(PARA-BROMOPHENYL)ACETONITRILE	SFS.
PARA-BROMOTOLUENE-	EK, SFS.
3-(N-BUTYLANILINO)PROPIONITRILE-	TCH.
2-TERT-BUTYLANTHRAQUINONE-	DUP.
PARA-TERT-BUTYLBENZALDEHYDE-	GIV.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TERT-BUTYLBENZENE	UOP.
PARA-TERT-BUTYLBENZOIC ACID	SHC.
ORTHO-(PARA-TERT-BUTYLBENZOYL)BENZOIC ACID	DUP.
6-TERT-BUTYL-META-CRESOL	KPT.
2-TERT-BUTYL-PARA-CRESOL	ACY.
2'-TERT-BUTYL-4',6'-DIMETHYLACETOPHENONE	GIV.
2-TERT-BUTYL-4-ETHYLPHENOL	ACY.
TERT-BUTYLHYDROQUINONE	X.
NI/-BUTYL-4-METHOXYMETANILAMIDE	ALL.
2-TERT-BUTYL-5-METHYLANISOLE	GIV.
ORTHO-SEC-BUTYLPHENOL	TNA(E).
ORTHO-TERT-BUTYLPHENOL	TNA(E).
PARA-TERT-BUTYLPHENOL	DOW, PRD, SCN.
BUTYLPHENOLS, MIXED	DOW, SCN.
PARA-TERT-BUTYLTOLUENE	GIV, SHC.
5-TERT-BUTYL-1,2,3-TRIMETHYLBENZENE	GIV.
5-TERT-BUTYL-META-XYLENE	GIV.
6-TERT-BUTYL-2,4-XYLENOL	PIT, PRD, RH.
D-10-CAMPHORSULFONIC ACID	KF, OTC(E).
2-(PARA-CARBOXYPHENOXY)-2-PIVALOYI-2,4-DICHLOROACETANILIDE	EK.
CEDRENE	GIV.
2-CHLOROACETAMIDO-5-CHLOROBENZOPHENONE	WYT.
4'-CHLOROACETOPHENONE	LIL.
4'-(CHLOROACETYL)ACETANILIDE	DUP.
META-CHLOROANILINE	DUP.
ORTHO-CHLOROANILINE	DUP.
PARA-CHLOROANILINE	DUP, MON.
3-(ORTHO-CHLOROANILINO)PROPIONITRILE	DUP, TCH.
5-CHLORO-ORTHO-ANISIDINE HYDROCHLORIDE	ALL.
1-CHLOROANTHRAQUINONE	ACY, TRC.
2-CHLOROANTHRAQUINONE	ACY.
ORTHO-CHLOROBENZALDEHYDE	HN.
PARA-CHLOROBENZALDEHYDE	HN.
CHLORO-7H-BENZ*DE*ANTHRACEN-7-ONE (CHLOROBENZANTHRONE)	ACY, TRC.
@CHLOROBENZENE, MONO	ACS, DOW, MON, MTO, PPG, SCC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
PARA-CHLOROBENZENESULFINIC ACID	TRC.
PARA-CHLOROBENZENESULFONAMIDE	NES.
PARA-CHLOROBENZENESULFONIC ACID	SHC, UPF.
ORTHO-CHLOROBENZOIC ACID	HN.
PA-A-CHLOROBENZOYL CHLORIDE	HN.
4,4'-(ORTHO-CHLOROBENZYLIDENE) D1-2,5-XYLIDINE	GAF.
PARA-CHLOROBENZYLSULFONAMIDE	PFZ.
CHLORO (PARA-CHLOROPHENYL) PHENYLMETHANE	OPC, UOP.
CHLOROCYCLOHEXANE	ACY.
1-CHLORO-2,5-DIETHOXY-4-NITROBENZENE	GAF.
7-CHLORO-1,3-DIHYDRO-3-HYDROXY-5-PHENYL-2H-1,4-BENZODIAZEPIN-2-ONE ACETATE ESTER	WYT.
7-CHLORO-1,3-DIHYDRO-5-PHENYL-2H-1,4-BENZODIAZEPIN-2-ONE-4OXIDE	WYT.
2-CHLORO-1,4-DIHYDROXYANTHRAQUINONE	HSH.
4'-CHLORO-2',5'-DIMETHOXYACETOACETANILIDE	PCW.
4-CHLORO-2,5-DIMETHOXYANILINE	PCW.
5-CHLORO-2,4-DIMETHOXYANILINE	PCW.
2-*PARA-CHLORO-ALPHA-(2-DIMETHYLAMINO)-ETHYL*BENZYLPYRIDINE	SK.
2-CHLORO-10-*3-(DIMETHYLAMINO) PROPYL*PHENOTHIAZINE	SK.
1-CHLORO-2,4-DINITROBENZENE (DINITROCHLOROBENZENE)	SDC.
3-CHLORO-4,6-DINITROBENZENESULFONIC ACID	TRC.
3-CHLORODIPHENYLAMINE	SK.
CHLORODIPHENYLMETHANE	OPC, UOP.
N-(2-CHLOROETHYL)-N-ETHYLANILINE	GAF.
4-CHLORO-N-ISOPROPYL-3-NITROBENZENESULFONAMIDE	TRC.
4-CHLOROMETANILIC ACID	DUP.
1-CHLORO-2-METHYLANTHRAQUINONE	ACY, TRC.
ALPHA-CHLOROMETHYLNAPHTHALENE, CRUDE	SFS.
4-CHLORO-N-METHYL-3-NITROBENZENESULFONAMIDE	TRC.
2-CHLORO-10-*3-(4-METHYL-1-PIPERAZNYL) PROPYL*PHENOTHIAZINE	SK.
CHLORONAPHTHALENES	KPT.
2-CHLORO-4-NITROANILINE (ORTHO-CHLORO-PARA-NITROANILINE)	DUP.
4-CHLORO-2-NITROANILINE (PARA-CHLCRO-ORTHO-NITROANILINE)	DUP.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
1-CHLORO-5-NITROANTHRAQUINONE	TRC.
1-CHLORO-2-NITROBENZENE	DUP, MON.
1-CHLORO-3-NITROBENZENE (CHLORO-META-NITROBENZENE)	DUP.
1-CHLORO-4-NITROBENZENE (CHLORO-PARA-NITROBENZENE)	DUP, MON.
2-CHLORO-5-NITROBENZENESULFINIC ACID	TRC.
@4-CHLORO-3-NITROBENZENESULFONAMIDE	AC(E), DUP, EKT, GAF, TRC, VPC.
4-CHLORO-3-NITROBENZENESULFONANILIDE	TRC.
2-CHLORO-5-NITROBENZENESULFONIC ACID	TRC.
2-CHLORO-5-NITROBENZENESULFONIC ACID, SODIUM SALT	DUP.
4-CHLORO-3-NITROBENZENESULFONIC ACID	TRC.
@4-CHLORO-3-NITROBENZENESULFONYL CHLORIDE	AC(E), EKT, SDC, VPC.
2-CHLORO-4-NITROBENZOIC ACID	SAL.
2-CHLORO-5-NITROBENZOIC ACID	TRC.
2-CHLORO-5-NITROBENZOIC ACID, METHYL ESTER	EGR.
2-CHLORO-4-NITROBENZOIC ACID, POTASSIUM SALT	SAL.
4-CHLORO-3-NITRO-N,N-DIMETHYLBENZENESULFONAMIDE	EKT.
4-CHLORO-3-NITROPHENYL METHYL SULFONE	TRC.
2-CHLORO-5-NITROPHENYL METHYL SULFONE	TRC.
2-CHLORO-4-NITROTOLUENE	DUP.
ORTHO-CHLOROPHENOL	DOW.
PARA-CHLOROPHENOL	DOW, MON.
(META-CHLOROPHENOL)DIETHANOLAMINE	HST.
2-CHLOROPHENOTHIAZINE	SK.
(PARA-CHLOROPHENYL)ACETONITRILE	OPC, UOP.
4-CHLORO-ALPHA-PHENYL-ORTHO-CRESOL	MON.
4-CHLORO-ORTHO-PHENYLENEDIAMINE	FMT.
1-(4-CHLOROPHENYL)-3-METHYL-NORMAL-ETHYLANILINE	HST.
1-(META-CHLOROPHENYL)-3-METHYL-2-PYRAZOLIN-5-ONE	TRC.
1-(ORTHO-CHLOROPHENYL)-3-METHYL-2-PYRAZOLIN-5-ONE	HST.
1-(PARA-CHLOROPHENYL)-3-METHYL-2-PYRAZOLIN-5-ONE	VPC.
PARA-CHLOROPHENYL METHYL SULFONE	TRC.
2-CHLORO-4-PHENYLPHENOL	DOW.
4-CHLOROPHTHALIC ACID	HSC, SW(E).
3-CHLORO-1,2-PROPANEDIOL	EKT.
1-(3-CHLOROPROPYL)-4-METHYLPIPERAZINE	SK.
7-CHLORO-4-QUINOLINOL	SDW.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-CHLORORESORCINOL	AC(E).
PARA-CHLOROTHIOPHENOL	SFA.
META-CHLOROTOLUENE	HN.
ORTHO-CHLOROTOLUENE	HK.
PARA-CHLOROTOLUENE	HN.
ALPHA-CHLOROTOLUENE (BENZYL CHLORIDE)	MON, SFS.
3-CHLORO-ORTHO-TOLUIDINE *NH/2=1*	DUP.
3-CHLORO-PARA-TOLUIDINE *NH/2=1*	DUP.
4-CHLORO-ORTHO-TOLUIDINE *NH/2=1* AND HYDROCHLORIDE	PCW.
N-*(5-CHLORO-ORTHO-TOLYL)AZO*SARCOSINE	ALL.
1-(6-CHLORO-ORTHO-TOLYL)-3-METHYL-2-PYRAZOLIN-5-ONE	TRC.
6-CHLORO-ALPHA,ALPHA,ALPHA-TRIFLUORO-META-TOLUIDINE	HK, PCW.
2-CHLORO-PARA-XYLENE	DUP.
4-CHLORO-3,5-XYLENOL	FER.
CHOLIC ACID	WIL.
CINNAMIC ACID	SFS.
CINNAMOYL CHLORIDE	EK, UOP.
@CRESOLS:	
META-CRESOL	KPT.
@O-CRESOL:	
ORTHO-CRESOL, FROM COAL TAR	KPT, PRD.
ORTHO-CRESOL, FROM PETROLEUM	MER, PRD, SW(E).
PARA-CRESOL	SW(E).
CRESOLS, MIXED:	
(M,P)-CRESOL:	
(META, PARA)-CRESOL, FROM COAL TAR	KPT, PRD.
(META, PARA)-CRESOL, FROM PETROLEUM	MER, NPC, PRD.
(O,M,P)-CRESOL:	
(ORTHO, META, PARA)-CRESOL, FROM COAL TAR	KPT.
OTHER	PIT.
@CRESYLIC ACID, REFINED	
CRESYLIC ACID, REFINED; FROM COAL TAR	KPT, PRD.
CRESYLIC ACID, REFINED; FROM PETROLEUM	MER, PRD.
CRESYL VIOLET PERCHLORATE	EK.
2-*PARA-(CYANOACETAMIDO)PHENYL*-6-METHYL-7-BENZO-THIAZOLESULFONIC ACID	DUP.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYANOACETIC ACID, 2-ETHYLHEXYL ESTER	GAF.
4-*(2-CYANOETHYL)ETHYLAMINO*-ORTHO-TOLUALDEHYDE	DUP.
N-(2-CYANOETHYL)-N-ETHYL-META-TOLUIDINE	EKT.
N-*2-(N-*2-CYANOETHYL*-META-TOLUIDINE)ETHYL*SUCCINIMIDE	EKT.
PARA-*(2-CYANOETHYL)METHYLAMINO*BENZALDEHYDE	DUP, GAF.
2-CYANOPYRIDINE	NEP.
4-CYANOPYRIDINE	NEP.
CYCLODODECATRIENE (CDDT)	DUP.
1,2-CYCLOHEXANEDICARBOXYLIC ANHYDRIDE	ACS.
CYCLOHEXANOL	ALF, DUP, MON.
@CYCLOHEXANONE	ALF, CEL, CNP, DBC, DUP, MON.
CYCLOHEXANONE OXIME	CNP.
CYCLOHEXENE	USR.
4-CYCLOHEXENE-1,2-DICARBOXIMIDE	SFC.
CYCLOHEXENE OXIDE	USR.
@CYCLOHEXYLAMINE	ABB, MON, RBC, VGC.
2-CYCLOPENTANONE-BETA-(2,5-DIHYDROXYBENZENE) ETHYL KETONE	X.
PARA-CYMENE	HPC.
DEOXYCHOLIC ACID	WIL.
1,5(AND 1,8)-DIACETAMIDOANTHRAQUINONE	AC(E).
1,4-DIAMINOANTHRAQUINONE	SDC, TRC.
1,5(AND 1,8)-DIAMINOANTHRAQUINONE	AC(E).
2,6-DIAMINOANTHRAQUINONE	AC(E).
3,3'-DIAMINOBENZANILIDE	TRC.
2,4-DIAMINOBENZENESULFONIC ACID *SO/3H=1*	DUP, TRC.
3,5-DIAMINOBENZOIC ACID	SAL.
4,4'-DIAMINO-2,2'-BIPHENYLDISULFONIC ACID	ACY.
1,3 DIAMINOCYCLOHEXANE	DUP.
1,4-DIAMINO-2,3-DICHLOROANTHRAQUINONE	DUP.
@1,4-DIAMINO-2,3-DIHYDROANTHRAQUINONE	AC(E), ACY, DUP, HSH, TRC.
4,8-DIAMINO-9,10-DIHYDRO-1,5-DIHYDROXY-9,10-DIOXO-2,6-ANTHRACENEDISULFONIC ACID	TRC.
4,8(AND 4,5)-DIAMINO-9,10-DIHYDRO-1,5(AND 1,8)-DIHYDROXY-9,10-DIOXY-2,6(AND 2,7)-ANTHRACENEDISULFONIC ACID	TRC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
1,4-DIAMINO-9,10-DIHYDRO-9,10-DIOXO-2,3-ANTHRACENEDICARBOXIMIDE	DUP.
1,5-DIAMINO-4,8-DIHYDROXYANTHRAQUINONE	VPC.
4,5-DIAMINO-1,8-DIHYDROXYANTHRAQUINONE	VPC.
2,4-DIAMINO-6-PHENYL-SEC-TRIAZINE-	RH, VEL.
2,6-DIAMINOPYRIDINE-	BIL(E).
4,4'-DIAMINO-2,2'-STILBENEDISULFONIC ACID-	ACY, CGY(E), GAF, TRC, VPC.
3,5-DIAMINO-2,4,6-TRIIODOBENZOIC ACID-	SDW.
4,5'-DIBENZAMIDO-1,1'-IMINODIANTHRAQUINONE	ACY, TRC.
DIBENZO(B,DEF)CHRYSENE-7,14-DIONE-	TRC.
1,5-DIBENZOYLNAPHTHALENE	GAF, HST, TRC.
DIBENZYLAZODICARBOXYLATE	WTL.
N,N'-DIBENZYLETHYLENEDIAMINE	WYT.
N,N'-DIBENZYLETHYLENEDIAMINE DIACETATE	WYT.
N',N'-DIBENZYLIDENETOLUENE-ALPHA,ALPHA-DIAMINE	SDH.
3,9-DIBROMO-7H-BENZ*DE*ANTHRACEN-7-ONE	TRC.
2,6-DIBROMO-4-NITROANILINE	SAL.
2,6-DIBROMO-4-NITROPHENOL-	SW(E).
2,5-DIBUTOXY-4-MORPHOLINOBENZENEDIAZONIUM SULFATE SALT (DBB SULFATE)-	ALL.
2,6-DI-TERT-BUTYL-4-NONYLPHENOL-	GAF.
2,4 DI-TERT-BUTYLPHENOL-	DUP.
3,4-DICHLOROANILINE-	DUP, EGR, MON.
3-(2,4-DICHLOROANILINO)-1-(2,4,6-TRICHLOROPHENYL)-2-PYRAZOLIN-5-ONE	EK.
1,5-DICHLOROANTHRAQUINONE-	TRC.
2,6-DICHLOROBENZALDEHYDE	DUP.
DICHLOROBENZANTHRONE	ACY.
@ORTHO-DICHLOROBENZENE-	ACS, DOW, MON, PPG.
ORTHO(AND PARA)-DICHLOROBENZENE-	MTO.
@PARA-DICHLOROBENZENE	ACS, DOW, DVC, PPG.
3,3'-DICHLOROBENZIDINE BASE AND SALTS-	CWN, LAK.
2,2'-DICHLOROBENZIL-	MTO.
2,4-DICHLOROBENZOIC ACID	HN.
2,4-DICHLOROBENZOYL CHLORIDE	HN.
DICHLOROBENZYL CHLORIDE-	SFS.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
2,4-DICHLORO-3,5-DINITRO-ALPHA,ALPHA,ALPHA-TRIFLUOROTOLUENE	GAF.
DICHLORODIPHENYLSILANE	DCC.
2',7'-DICHLOROFLUORESCEIN	EK.
2,5-DICHLORO-4-(3-METHYL-5-OXO-2-PYRAZOLIN-1-YL)BENZENESULFONIC ACID	ACY, HST, TRC.
DICHLOROMETHYLPHENYLSILANE	DCC.
2,6-DICHLORO-4-NITROANILINE	CWN.
1,2-DICHLORO-4-NITROBENZENE	DUP, EGR, MON.
1,4-DICHLORO-2-NITROBENZENE (NITRO-PARA-DICHLOROBENZENE)	DUP.
@2,4-DICHLOROPHENOL	DOW, MON, RDA.
3-(2',6'-DICHLOROPHENYL)-5-METHYL-ISOXAZOLE-4-CARBONYL CHLORIDE	OTC(E).
2,6-DICHLOROPYRAZINE	ACY.
3,6-DICHLOROPYRIDAZINE	ACY.
4,7-DICHLOROQUINOLINE	PD, SDW.
2,5-DICHLOROSULFANILIC ACID *SO/3H=1*	VPC.
2,5-DICHLORO-4-SULFOBENZENEDIAZONIUM SULFATE	TRC.
PARA,ALPHA-DICHLOROTOLUENE	DUP, HN.
ALPHA,ALPHA-DICHLOROTOLUENE (BENZAL CHLORIDE)	SFS.
2,6-DICHLOROTOLUENE	DUP.
@DICYCLOHEXYLAMINE	ABB, MON, VGC.
DICYCLOPENTADIENE (INCLUDES CYCLOPENTADIENE)	ENJ(E).
DICYCLOPENTADIENE DIOXIDE	VEL.
DIDODECYLBENZENE	CO.
ALPHA, ALPHA DIETHOXYACETOPHENONE	NEP.
PARA-DIETHOXYBENZENE	ALL.
3-DIETHYLAMINOACETANILIDE	DUP.
PARA-(DIETHYLAMINO)BENZALDEHYDE	DUP, TRC.
ALPHA-*(2-DIETHYLAMINO)ETHYL*-ALPHA-PHENYLCYCLOHEXANEMETHANOL, HYDROCHLORIDE	ACY.
7-DIETHYLAMINO-4-METHYLCOUMARIN, CRUDE	GAF, SDH.
META-(DIETHYLAMINO)PHENOL (N,N-DIETHYL-3-AMINOPHENOL)	ACY.
3-*(4'-N,N-DIETHYLAMINO)PHENYLAZO*-1H-1,2,4-TRIAZOLE	TRC.
3-(DIETHYLAMINO)PROPIOPHENONE	ACY.
@N,N-DIETHYLANILINE	ACS, ACY, DUP.
N,N-DIETHYL-META-ANISIDINE	DUP.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DIETHYLBENZENE	DOW.
N,N-DIETHYLCYCLOHEXYLAMINE	DUP.
N1/,N1/-DIETHYL-4-METHOXYMETANILAMIDE	PCW.
N,N-DIETHYL-4-NITROSO-META-PHENETIDINE	GAF.
N,N-DIETHYL-META-PHENETIDINE	GAF.
N,N-DIETHYL-PARA-PHENYLENEDIAMINE OXALATE	EK.
DIETHYL-PARA-TOLUIDINE	RSA.
N,N-DIETHYL-META-TOLUIDINE	DUP.
6,11-DIHYDRODIBENZ(B,E)OXEPIN-11-ONE	PFZ.
9,10-DIHYDRO-9,10-DIOXO-1,5-ANTHRACENEDISULFONIC ACID	TRC.
9,10-DIHYDRO-9,10-DIOXO-1,5-ANTHRACENEDISULFONIC ACID, DISODIUM SALT	TRC.
9,10-DIHYDRO-9,10-DIOXO-1,8-ANTHRACENEDISULFONIC ACID, POTASSIUM SALT	TRC.
9,10-DIHYDRO-9,10-DIOXO-2,6-ANTHRACENEDISULFONIC ACID AND SALT	AC(E), TRC.
9,10-DIHYDRO-9,10-DIOXO-2,7-ANTHRACENEDISULFONIC ACID AND SALT	TRC.
@9,10-DIHYDRO-9,10-DIOXO-1-ANTHRACENESULFONIC ACID AND SALT (GOLD SALT)	AC(E), ACY, TRC.
9,10-DIHYDRO-5-NITRO-9,10-DIOXO-1-ANTHRACENESULFONIC ACID	TRC.
1,2-DIHYDRO-2,2,4,7-TETRAMETHYL GUINOLINE	EKT.
1,2-DIHYDROTRIAMCINOLONE	X.
1,2-DIHYDRO-2,2,4-TRIMETHYLGUINOLINE	EKT.
17 ALPHA,21-DIHYDROXY-16 ALPHA-METHYLPREGNA-4,9(11)-DIENE-3,20-DIONE,21 ACETATE	X.
17 ALPHA,21-DIHYDROXY-16 ALPHA-METHYLPREGNA-1,4,9(11)-TRIENE-3,20-DIONE	X.
17 ALPHA,21-DIHYDROXY-16 BETA-METHYL-1,4,9(11)-PREGNATRIENE-3,20-DIONE,21 BENZOATE	X.
@1,4-DIHYDROXYANTHRAQUINONE (QUINIZARIN)	AC(E), ACY, DUP, EKT, HSH, ICC, TRC.
1,8-DIHYDROXYANTHRAQUINONE	TRC.
2,5-DIHYDROXYBENZOENESULFONIC ACID, POTASSIUM SALT	EK.
@2,4-DIHYDROXYBENZOPHENONE	ACY, DUP, EKT.
1,5-DIHYDROXY-4,8-DINITROANTHRAQUINONE	TRC, VPC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@1,8-DIHYDROXY-4,5-DINITROANTHRAQUINONE	DUP, EKT, VPC.
6,7-DIHYDROXY-2-NAPHTHALENESULFONIC ACID	WAY.
3,3-DIHYDROXY-2-NAPHTHANILIDE-	ABB, WAY.
11 BETA,21-DIHYDROXYPREGNA-4,16-DIENE-3,20-DIONE,21-ACETATE	X.
11 BETA,21-DIHYDROXYPREGNA-1,4,16-TRIENE-3,20-DIONE,21-ACETATE-	X.
16,17-DIHYDROXYVIOLANTHRONE (DIHYDROXYDIBENZANTHRONE)	ACY, DUP.
3,5-DIIODOSALICYLIC ACID, LITHIUM SALT	EK.
DIISOPROPYLBENZENE	DOW.
N,N'-DIISOPROPYL-PARA-PHENYLENEDIAMINE	DUP.
2,4-DIMETHOXYANILINE	DUP.
2,5-DIMETHOXYANILINE	EKT, PCW.
1,5(AND 1,8)-DIMETHOXYANTHRAQUINONE-	TRC.
2,5-DIMETHOXYBENZALDEHYDE-	CWN.
META-DIMETHOXYBENZENE-	ACY, ARS, GAF.
3,3'-DIMETHOXYBENZIDINE-	UOP.
3,3'-DIMETHOXYBENZIDINE HYDROCHLORIDE-	CWN, X.
2,6-DIMETHOXYBENZYLCHLORIDE-	UPJ.
N,N'-*(3,3'-DIMETHOXY-4,4'-BIPHENYLYLENE)BIS(AZO)*BIS*N-METHYLTAURINE*-	GAF.
2,5-DIMETHOXY-ALPHA-METHYLPHENETHYLAMINE	X.
1,4-DIMETHOXY-2-NITROBENZENE	EKT.
2,5-DIMETHOXYTETRAHYDROFURAN	HEX.
PARA-(DIMETHYLAMINO)BENZALDEHYDE	DUP, TRC.
META-(DIMETHYLAMINO)BENZOIC ACID	MLS, SDH.
6-DIMETHYLAMINO-2-*2-(2,5-DIMETHYL-1-PHENYL-3-PYRRYL)-VINYL*-1-METHYL-1-QUINOLINIUM METHYL SULFATE-	X.
2-**2-(DIMETHYLAMINO)ETHYL*-2-THENYLAMINO*-PYRIDINE-	ABB.
2-DIMETHYLAMINOMETHYL-4-NITRO-6-ETHOXYPHENOL	ARA.
2-DIMETHYLAMINOMETHYL-4-NITRO-6-METHOXYPHENOL-	ARA.
6-DIMETHYLAMINO-1-METHYLQUINALDINIUM METHYLSULFATE	EK.
6-(DIMETHYLAMINO)QUINALDINE-	EK.
META-(DIMETHYLAMINO)PHENOL	ACY.
11-(3-DIMETHYLAMINO-1-PROPYL)-6H-DIBENZ(B,E)OXEPIN-11-OL	PFZ.
@N,N-DIMETHYLANILINE-	ACS, ACY, DUP.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
7,12-DIMETHYLBENZ*A*ANTHRACENE	EK.
3,3'-DIMETHYLBENZIDINE HYDROCHLORIDE	EK.
@N,N-DIMETHYLBENZYLAMINE-	ARS, MLS, RH, SW(E).
ALPHA,ALPHA-DIMETHYLBENZYL HYDROPEROXIDE	USS.
2,2'-DIMETHYL-1,1'-BIANTHRAQUINONE	ACY, TRC.
5,5-DIMETHYL-1,3-CYCLOHEXANEDIONE-	EKT.
@N,N-DIMETHYLCYCLOHEXYLAMINE-	ABB, DUP, JCC.
5,5-DIMETHYLHYDANTOIN-	GLY.
2,6-DIMETHYLHYDROQUINONE	ARA.
2,3-DIMETHYLINDOLE	DUP.
2,5-DIMETHYL-4(2)-MORPHOLINYLMETHYLPHENOL HYDROCHLORIDE	WAY.
N,N-DIMETHYL-1-NAPTHYLAMINE-	EK.
N,N-DIMETHYL-PARA-PHENYLENEDIAMINE, MONOHYDROCHLORIDE-	EK.
1,4-DIMETHYLPIPERAZINE	JCC.
DIMETHYL-5-SULFOISOPHTHALATE	X.
DIMETHYL-ORTHO-TOLUIDINE	RSA.
N,N-DIMETHYL-PARA-TOLUIDINE-	EK, RSA.
2,4-DINITROANILINE	HST, SDC.
PARA-(2,4-DINITROANILINO) PHENOL-	SDC.
1,5(AND 1,8)-DINITROANTHRAQUINONE-	SDC, TRC.
META-DINITROBENZENE-	DUP.
2,4-DINITROBENZENESULFONIC ACID-	EK, TRC.
3,5-DINITROBENZOIC ACID-	SAL.
3,5-DINITROBENZOYL CHLORIDE-	EK.
DINITROCAPRYLPHENOL-	RH.
2,4-DINITROCUMENE-	DUP.
1-(3,5-DINITRO-2-HYDROXYPHENYLAZO)-2-HYDROXYNAPHTHALENE	TRC.
2,4-DINITROPHENOL, TECH.	SDC, VPC.
3,5-DINITROSALICYLIC ACID-	SAL.
@4,4'-DINITROSTILBENE-2,2'-DISULFONIC ACID-	AC(E), ACY, CGY(E), DUP, GAF, SDH, TRC.
@2,4-DINITROTOLUENE	ACS, DUP, MOB(E), RUC.
@2,4(AND 2,6)-DINITROTOLUENE-	DUP, UCC, X.
DINONYLPHENOL-	GAF, JCC.
2,4-DI-TERT-PENTYLPHENOL	PAS.
DI-TERT-PENTYLPHENOXYACETYL CHLORIDE	EK.
1,5-DIPHENOXYANTHRAQUINONE	VPC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DIPHENYLACETONITRILE, TECH.	ASH.
DIPHENYLAMINE	ACY, DUP, ORO, RUC, USR.
2,5-DIPHENYL-PARA-BENZOQUINONE	EK.
N,N'-DIPHENYLETHYLENEDIAMINE	RPC.
DIPHENYLMETHANE	PD.
2,5-DIPHENYLOXAZOLE	EK.
4,4'-DITHIODIANILINE	ACY.
1,4-DI-PARA-TOLUIDINOANTHRAQUINONE	HSH.
DODECYLANILINE	ABB, X.
DIVINYLBENZENE	DOW, FG.
DODECYLBENZYL CHLORIDE	SFS.
DODECYLNITROBENZENE	RH.
PARA-DODECYLPHENOL	GAF, MCB(E), MON, X.
6-(2-ETHOXY-1-NAPHTHAMIDO) PENICILLANIC ACID	WYT.
2-ETHOXY-1-NAPHTHOIC ACID	WYT.
2-ETHOXY-1-NAPHTHOYL CHLORIDE	OPC, WYT.
4-ETHOXY-ORTHO-PHENYLENE DIAMINO	TRC.
N1/-(6-ETHOXY-3-PYRIDAZINYL)SULFANILAMIDE	ACY.
3'-(ETHYLAMINO)ACETANILIDE	EKT.
ETHYL-META-AMINOBENZOIC ACID	RSA.
3-(ETHYLAMINO)-PARA-CRESOL	DUP.
N-ETHYL-N-(BETA-AMINOETHYL)-META-TOLUIDINE	X.
3-(ETHYLAMINO)-PARA-TOLUENESULFONIC ACID *SO/3H=1*	DUP.
@N-ETHYLANILINE, REFINED	ACS, ACY, DUP.
@2-(N-ETHYLANILINO)ETHANOL	DUP, MIL, TCH.
1-*2-(ETHYLANILINO)ETHYLENE*PYRIDINIUM CHLORIDE	GAF.
*2-(N-ETHYLANILINO)ETHYL*TRIMETHYLAMMONIUM CHLORIDE	DUP.
3-(N-ETHYLANILINO)PROPIONITRILE	MIL, TCH.
ALPHA-(N-ETHYLANILINO)-META-TOLUENESULFONIC ACID	GAF, SDH.
ALPHA-(N-ETHYLANILINO)-PARA-TOLUENESULFONIC ACID	ACS, TRC.
N-ETHYL-PARA-ANISIDINE	EKT.
ETHYLBENZYL CHLORIDE	SFS.
2-(N-ETHYL-N,BETA-CYANOETHYL)-4-ACETAMINO ANISOLE	VPC.
3,3''-ETHYLENEDIOXYDIPHENOL	ABB, WAY.
N-ETHYLCYCLOHEXYLAMINE	ABB, VGC.
N-ETHYL-N-(2,3-DIHYDROXYPROPYL)-META-TOLUIDINE	EKT.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
3-ETHYL-2-*5-(3-ETHYL-2-BENZOTHIAZOLINYLIDENE)-1,3-PENTADIENYL*-BENZOTHIAZOLIUM IODIDE	EK.
ETHYLIODOPHENYLUNDECANOATE	X.
2-@N-ETHYL-PARA-*(6-METHOXY-2-BENZONTHIAZOYL)AZO*ANILINO@ETHANOL	TRC.
DL-13B-ETHYL-3-METHOXY-8,14-SECOGONA-1,3,5(10),9(11)-TETRAENE-14,17-DIONE	WYT.
N-ETHYL-N-(BETA-METHYLSULFONAMIDOETHYL)-META-TOLUIDINE	ABB, X.
N-ETHYL-1-NAPHTHYLAMINE	DUP.
ALPHA-ETHYL-3-NITROCINNAMIC ACID	SDW.
1-ETHYL-7-NITRO-1,2,3,4-TETRAHYDRO-2,2,4-TRIMETHYLGUINOLINE	EKT.
PARA-ETHYLPHENOL	ACY.
N-ETHYL-N-PHENYLBENZYLAMINE	DUP, SDH.
1-ETHYL-1,2,3,4-TETRAHYDRO-2,2,4-TRIMETHYLGUINOLINE	EKT.
6-ETHYL-1,2,3,4-TETRAHYDRO-1,1,4,4-TETRAMETHYL-NAPHTHALENE	GIV.
ETHYL TOLUENE	DOW.
N-ETHYL-PARA-TOLUENESULFONAMIDE	NES.
N-ETHYL-META-TOLUIDINE	DUP.
N-ETHYL-ORTHO-TOLUIDINE	DUP.
2-(N-ETHYL-META-TOLUIDINO)ETHANOL	EKT, TCH.
3-(N-ETHYL-META-TOLUIDINO)PROPIONITRILE	DUP, TCH.
ALPHA-(N-ETHYL-META-TOLUIDINO)-META-TOLUENESULFONIC ACID	GAF.
ORTHO-FORMYLBENZENESULFONIC ACID (ORTHO-SULFOBENZALDEHYDE)	SDH.
FURAN	PLC, QKO.
FURFURYL ALCOHOL	QKO.
2,2'-*(META-CHLOROPHENYL)IMINO*DIETHANOL	EKT, TCH.
HEXABROMOBENZENE	VEL.
HEXACHLOROBENZENE	DVC.
HEXACHLOROCYCLOPENTADIENE	VEL, X.
1,4,5,6,7,7-HEXACHLORO-5-NORBORNENE-2,3-DICARBOXYLIC ACID	X.
1,4,5,6,7,7-HEXACHLORO-5-NORBORNENE-2,3-DICARBOXYLIC ANHYDRIDE (CHLORENDIC ANHYDRIDE)	VEL.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
HEXAHYDRO-1-METHYL-4-PHENYL-1H-AZEPINE-4-CARBONITRILE	WYT.
HEXAMETHYLENIMINE	CEL, DUP.
HIPPURIC ACID	SFS.
PARA-HYDRAZINOBENZENESULFONIC ACID	GAF, STG.
HYDRAZOBENZENE	LAK.
@HYDROQUINONE, TECH.	CRS, EKT, GYR.
3'-HYDROXYACETOPHENONE	SDH.
6'-HYDROXY-META-ACETOTOLUIDIDE	TRC.
03 BETA-HYDROXYANDROST-5-EN-17-ONE-PARA-*BIS-(Z-CHLOROETHYL)-AMINOPHENYL*ACETATE	X.
PARA-HYDROXYBENZALDEHYDE	DOW.
PARA-HYDROXYBENZENESULFONIC ACID	PRD, UPF.
PARA-HYDROXYBENZOIC ACID	HN.
3'-HYDROXY-2-(N-BENZYL-N-METHYLAMINO)ACETOPHENONE HYDROCHLORIDE	SDW.
ALPHA-HYDROXY-ALPHA-ALPHA-BIS(PARA-HYDROXYPHENYL)-ORTHO-TOLUENESULFONIC ACID, GAMMA-SULTONE	EK.
N-HYDROXY-5-ENDO-CIS-NONBORNENE-2,3-DICARBOXIMIDE	X.
4'-(2-HYDROXYETHOXY)ACETANILIDE	GAF.
META-(BETA-HYDROXYETHOXY)PHENOL	BJL.
ORTHO-(BETA-HYDROXYETHOXY)PHENOL	BJL.
3-*N-(2-HYDROXYETHYL)ANILINO*PROPIONITRILE	MIL, TCH.
3-*N-(2-HYDROXYETHYL)ANILINO*PROPIONITRILE, ACETATE	MIL, TCH.
N-(BETA-HYDROXYETHYL)-3,5-DIHYDROXYBENZAMIDE	ABB, WAY.
3-N-2-HYDROXYETHYL-META-TOLUIDINE-PROPIONITRILE	DUP.
N-*7-HYDROXY-8-(2-HYDROXY-5-METHYLSULFAMAYL)PHENYLAZO*-1-NAPHTHYL ACETAMIDE	TRC.
6'-HYDROXY-5'-*(2-HYDROXY-5-NITROPHENYL)AZO*-META-ACETOTOLUIDIDE	TRC.
4-HYDROXYMETANILAMIDE	DUP, TRC.
4-HYDROXYMETANILANILIDE	TRC.
4-HYDBOXYMETANILIC ACID	TRC.
3-HYDROXY-2-METHYLCINCHONINIC ACID	GAF, TRC.
4-HYDROXY-N1/-METHYLMETANILAMIDE	TRC.
3-HYDROXY-N-(3-N-MORPHOLINOPROPYL)-2-NAPHTHAMIDE	FMT, WAY.
7-HYDROXY-1,3-NAPHTHALENEDISULFONIC ACID	DUP, TRC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
3-HYDROXY-2,7-NAPHTHALENEDISULFONIC ACID, DISODIUM SALT	ACY, TRC.
7-HYDROXY-1,3-NAPHTHALENEDISULFONIC ACID, DISODIUM SALT	ACY.
6-HYDROXY-2-NAPHTHALENESULFONIC ACID, SODIUM SALT	ACY, TRC.
8-HYDROXY-1-NAPHTHALENESULFONIC ACID, GAMMA-SULTONE	TRC.
3-HYDROXY-2-NAPHTHOIC ACID	ACY, PCW.
1-(2-HYDROXY-1-NAPHTHYAZO)-6-NITRO-2-NAPHTHOL-4-SULFONIC ACID	TRC.
N-(7-HYDROXY-1-NAPHTHYL)ACETAMIDE	TRC.
2-HYDROXY-5-NITROMETANILIC ACID	TRC.
1-(2-HYDROXY-4-NITROPHENYLAZO)-2-HYDROXYNAPHTHALENE	TRC.
1-HYDROXY-6-OCTADECYLOXY-2-NAPTHOIC ACID	ARA.
2-HYDROXY-4-NORMAL-OCTOXYBENZOPHENONE	ACY, CCW.
2-HYDROXY-4-SULFO-1-NAPHTHALENEDIAZONIUM HYDROXIDE, INNER SALT	ACY.
1-HYDROXY-4-PARA-TOLUIDINOANTHRAQUINONE	HSH.
2-IMIDAZOLIDINONE	VAL.
1,1'-IMINOBIS*4-AMINOANTHRAQUINONE*	ACY, TRC.
1,1'-IMINOBIS*4-BENZAMIDOANTHRAQUINONE*	ACY.
1,1'-IMINOBIS*4-NITROANTHRAQUINONE*	ACY, TRC.
1,1'-IMINODIANTHRAQUINONE	ACY.
2-INDOLECARBOXYLIC ACID	ARA.
INDOLE-2,4-DIONE	DUP, TRC.
2-IODACETAMIDO-5-CHLOROBENZOPHENONE	WYT.
2-IODOTHIOPHENE	EK.
ISOBUTYLBENZENE	PLC, TNA(E).
@ISOCYANIC ACID DERIVATIVES:	
BITOLYLENE DIISOCYANATE	CWN, UPJ.
DIPHENYLMETHANE 4,4'-DIISOCYANATE	MOB(E), UPJ.
TRIS(2-ISOCYANATE-PARA-TOLYL ISOCYANATE)	DUP.
PHENYLISOCYANATE	MOB(E), UPJ.
@POLYMETHYLENE POLYPHENYLISOCYANATE	JCC, MOB(E), RUC, UPJ.
TOLUENE 2,4-DIISOCYANATE	DUP, MOB(E).
TRIMERS OF TOLUENE 2,4 AND 2,6 DIISOCYANATE	DUP.
TOLUENE 2,4-AND 2,6-DIISOCYANATE (65/35 MIXTURE)	DUP, MOB(E).
@TOLUENE 2,4-AND 2,6-DIISOCYANATE (80/20 MIXTURE)	ACS, BAS, DOW, DUP, MOB(E), OMC, RUC, UCC.
@ISOCYANIC ACID DERIVATIVES, ALL OTHER	CWN, DOW, DUP, MOB(E).

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
2-ISONITROSOACETANILIDE	DUP.
ISOOCTYLPHENOL	PRD.
ISOPHTHALIC ACID	ACC, ATR.
ISOPHTHALIC ACID, DIALLYL ESTER	FMP(E).
ISOPHTHALIC ACID, DIPHENYL ESTER	BJL.
ISOPHTHALONITRILE	SW(E).
ISOPHTHALOYL CHLORIDE	DUP.
N-ISOPROPYLANILINE	USR.
4,4'-ISOPROPYLIDENEBIS*2,6-DIBROMOPHENOL* (TETRABROMOBIS PHENOL A)	DOW.
5,5'-ISOPROPYLIDENEBIS(2-HYDROXY-META-XYLENE-ALPHA,ALPHA '-DIOL)	ARK.
@4,4'-ISOPROPYLIDENEDIPHENOL (BISPHENOL A)	DOW, GE, SHC, UCC.
4,4'-ISOPROPYLIDENEDIPHENOL, ETHOXYLATED	ICI.
4,4'-ISOPROPYLIDENEDIPHENOL, PROPOXYLATED	ICI.
ORTHO-ISOPROPYLPHENOL	TNA(E).
ISOPROPYLPHENOL, MIXED	FMP(E).
4-ISOPROPYL-META-PHENYLENEDIAME	DUP.
LEUCO QUINIZARIN	TRC.
2,4-LUTIDINE	KPT.
3,4-LUTIDINE	KPT, UCC.
MANDELONITRILE	KF.
@MELAMINE	ACS, ACY, MLC.
PARA-MENTHA-1,4(8)-DIENE	GIV.
@DL-PARA-MENTHA-1,8-DIENE	ARZ, GIV, HPC, NCI.
PARA-MENTH-1-ENE (CARVOMENTHENE)	GIV.
ORTHO-MERCAPTOBENZOIC ACID	AMB.
@METANILIC ACID	ACY, DUP, MRA, TRC.
2-METHOXY-5-ACETAMINO-N,N-BIS(ACETOXYETHYL)ANILINE	HST.
4'-METHOXY-2-(PARA-METHOXYPHENYL)ACETOPHENONE	ARA.
METHOXYMETHYLDIPHENYL OXIDE	SFS.
N-(2-METHOXY-1-NAPHTHYL)ACETAMIDE	TRC.
(PARA-METHOXYPHENYL)ACETIC ACID	UOP.
6-METHOXYQUINOLINE	DUP.
METHYLACETOACETICESTER ENAMINE OF D-2-AMINO-2-(1,4-CYCLO HEXADIENYL)ACETIC ACID, SODIUM SALT	TRD.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
1-(METHYLAMINO)ANTHRAQUINONE	AC(E), ACY.
1-(METHYLAMINO)-4-PARA-TOLUIDINOANTHRAQUINONE	VPC.
2-(N-METHYLANILINO)ETHANOL	MIL, TCH.
3-(N-METHYLANILINO)PROPIONITRILE	DUP, MIL.
5-METHYL-ORTHO-ANISIDINE *NH/2=1*	SW(E).
5-METHYL-ORTHO-ANISIDINESULFONIC ACID	ACS.
META-METHYLANISOLE	GIV.
2-METHYLANTHRAQUINONE	ACY.
3-METHYLBENZO*F*QUINOLINE	ACY.
2-METHYLBENZOTHIAZOLE	FMT.
N-METHYLBENZYLAMINE	MLS, SDW.
META-METHYLBENZYLPIPERAZINE	PFZ.
METHYL BIPHENYL	DOW.
3-METHYLCHOLANTHRENE	EK.
1-METHYL-4-(3-CHLOROPROPYL)-PIPERAZINE HYDROCHLORIDE	SK.
METHYLCYCLOHEXANE	PLC.
METHYLCYCLOPENTADIENE	ENJ(E).
N-METHYLDICYCLOHEXYLAMINE	ABB.
4,4'-METHYLENEBIS*2-CHLOROANILINE*	APO, DUP.
4,4'-METHYLENEBIS*N,N-DIETHYLANILINE*	ACY, TRC.
4,4'-METHYLENEBIS*N,N-DIMETHYLANILINE* (METHANE BASE)	ACY, DUP, SDH.
@4,4'-METHYLENEDIANILINE	ACS, DOW, DUP, MOB(E), RUC.
5,5'-METHYLENEDISALICYLIC ACID	HN.
METHYLHYDROQUINONE	EKT.
2-METHYLINDOLE-3-CARBOXALDEHYDE	GAF.
6-METHYL-2-(2-METHYL-6-QUINOLYL)-7-BENZOTHIAZOLE SULFONIC ACID	DUP.
N-METHYL-PARA-NITROANILINE	ACY, EK.
5-METHYL-4-NITRO-ORTHO-ANISIDINE	PCW.
4-METHYL-2-NITROANISOLE	SW(E).
2-METHYL-5-NITROIMIDAZOLE	RDA.
2-METHYL-5-NORBORNENE-2,3-DICARBOXYLIC ANHYDRIDE	VEL.
5-METHYL-5-NORBORNENE-2,3-DICARBOXYLIC ANHYDRIDE	ACS.
META-(3-METHYL-5-OXO-2-PYRAZOLIN-1-YL)BENZENESULFONIC ACID	TRC, VPC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
PARA-(3-METHYL-5-OXO-2-PYRAZOLIN-1-YL)BENZENESULFONIC ACID	ACY, GAF, TRC.
3-(3-METHYL-5-OXO-2-PYRAZOLIN-1-YL)-1,5-NAPHTHALENEDISULFONIC ACID	TRC.
4-(3-METHYL-5-OXO-2-PYRAZOLIN-1-YL)-META-TOLUENESULFONIC ACID *SO/3H=1*	TRC.
1-METHYL-4-PHENYLISONIPECOTIC ACID	SDW, WYT.
1-METHYL-4-PHENYL-4-PIPERIDINE CARBONITRILE	WYT.
@3-METHYL-1-PHENYL-2-PYRAZOLIN-5-ONE	ACY, DUP, SDH.
4'-*(4-METHYL-2-PYRIMIDINYL)SULFAMOYL*ACETANILIDE	DUP.
1-METHYLPYRROLE	PCW.
@ALPHA-METHYLSTYRENE	ACS, CLK, DOW, GP, SKO, UCC, USS.
AR-METHYLSTYRENE	DOW.
2-(METHYLSULFONYL)-4-NITROANILINE	TRC.
1,5-NAPHTHALENEDISULFONIC ACID	DUP.
2,7-NAPHTHALENEDISULFONIC ACID	TRC.
1-NAPHTHALENESULFONIC ACID	TRC.
2-NAPHTHALENESULFONIC ACID	ACY.
1-NAPHTHALENESULFONIC ACID, SODIUM SALT	TRC.
2-NAPHTHALENESULFONIC ACID, SODIUM SALT	ACY.
1,4,5,8-NAPHTHALENETETRACARBOXYLIC ACID	TRC.
NAPHTHALIMIDE	ACS.
1-NAPHTHOL	UCC.
2-NAPHTHOL, TECH.	ACY.
NAPHTH*1,2-D**1,2,3*OXADIAZOLE-5-SULFONIC ACID	TRC.
1-NAPHTHYLAMINE	DUP.
PARA-(2-NAPHTHYLAMINO)PHENOL (N-(PARA-HYDROXYPHENYL)-2-NAPHTHYLAMINE)	SDC.
(2-NAPHTHYLTHIO)ACETIC ACID	ACY.
NICOTINONITRILE	NEP.
@3'-NITROACETANILIDE	DUP, EKT, TRC.
4'-NITROACETANILIDE	GAF, TRC.
3'-NITRO-PARA-ACETANISIDE	EKT.
4'-NITRO-ORTHO-ACETANISIDIDE	DUP.
3'-NITROACETOPHENONE	SDH.
META-NITROANILINE	X.
ORTHO-NITROANILINE	BUC, MON.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
PARA-NITROANILINE	MON, X(E).
2-NITRO-PARA-ANISIDINE *NH/2=1*	DUP.
4-NITRO-ORTHO-ANISIDINE *NH/2=1*	DUP.
ORTHO-NITROANISOLE	DUP.
PARA-NITROANISOLE	DUP.
5-NITROANTHRANILIC ACID	TRC.
1-NITROANTHRAQUINONE	ACY, TRC.
META-NITROBENZALDEHYDE	SDH.
@NITROBENZENE	ACY, DUP, FST, RUC.
META-NITROBENZENESULFONIC ACID	ACY, DUP.
META-NITROBENZENESULFONIC ACID, SODIUM SLAT	MRA.
PARA-NITROBENZYL BROMIDE	DUP.
4-(PARA-NITROBENZYL)PYRIDINE	EK.
META-NITROBENZOIC ACID	SAL.
PARA-NITROBENZOIC ACID	DUP.
META-NITROBENZOIC ACID, SODIUM SALT	SAL.
4'-NITRO-4-BIPHENYLCARBOXYLIC ACID	DUP.
2-NITRO-PARA-CRESOL	SW(E).
NITRODIPHENYLAMINE	ACY, MON.
5-NITROISOPHTHALIC ACID	SAL.
1-NITRONAPHTHALENE	DUP.
3-NITRO-1,5-NAPHTHALENEDISULFONIC ACID	TRC.
7(AND 8)-NITRONAPHTH*1,2-D**1,2,3*OXADIAZOLE-5-SULFONIC ACID	GAF, TRC.
ORTHO-NITROPHENOL	DUP, MON.
PARA-NITROPHENOL	DUP, MON.
4'-(PARA-NITROPHENYL)ACETOPHENONE	ASH, DUP.
2-(ORTHO-NITROPHENYLAZO)-4,6-DI-TERT-AMYLPHENOL (OH=1)	TRC.
4-NITRO-ORTHO-PHENYLENEDIAMINE	ASH, FMT.
(PARA-NITROPHENYL)HYDRAZINE	EK.
2-(PARA-NITROPHENYL)-2H-NAPHTHO*1,2-D*TRIAZOLE-6,8-DISULFONIC ACID	TRC.
4-NITROSO-N-ETHYL-N-(BETA-METHYLSULFONAMIDOETHYL)-META-TOLUIDINE	ABB, X.
PARA-NITROSOPHENOL	ACY, SDC.
BETA-NITROSTYRENE	CWN.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-NITRO-4'-(5-SULFO-2H-NAPHTHO*1,2-D*TRIAZOL-2-YL)-2,2'-STILBENEDISULFONIC ACID	TRC.
3-NITRO-PARA-TOLUAMIDE	SDH.
META-NITROTOLUENE	DUP, FST.
ORTHO-NITROTOLUENE	DUP, FST.
PARA-NITROTOLUENE	DUP, FST.
NITROTOLUENE MIXTURES	DUP, FST.
PARA-NITROTOLUENE-ORTHO-SULFONIC ACID	CGY(E).
@5-NITRO-ORTHO-TOLUENESULFONIC ACID *SO/3H=1*	ACY, DUP, GAF, SDH.
3-NITRO-PARA-TOLUENESULFONIC ACID *SO/3H=1*	TRC.
3-NITRO-PARA-TOLUIC ACID, METHYL ESTER	SDH.
5-NITRO-ORTHO-TOLUIDINE *NH/2=1*	PCW.
2-NITRO-PARA-TOLUIDINE *NH/2=1*	SW(E).
4-NITRO-META-XYLENE	DUP.
NONYL-DINONYLPHENOL, MIXTURE	USR.
@NONYLPHENOL	GAF, JCC, KLM, MCB(E), MON, PRD, RH, SCN, UCC.
OCTYLPHENOL	RH, SCN.
OXANILIDE	EK.
@1-*(7-OXO-7H-BENZ*DE*ANTHRACENE-3-YL)AMINO*-ANTHRAQUINONE	ACY, DUP, TRC.
1,1'-*(7-OXO-7H-BENZ*DE*ANTHRACEN-3,9-YLENE)-DIIMINO*DIANTHRAQUINONE	TRC.
5-OXO-1-PHENYL-2-PYRAZOLINE-3-CARBOXYLIC ACID, ETHYL ESTER	STG.
5-OXO-1-(PARA-SULFOPHENYL)-2-PYRAZOLINE-3-CARBOXYLIC ACID	ACY, HST, STG, VPC.
4,4'-OXYDIANILINE	DUP.
PENTABROMOCHLOROCYCLOHEXANE	DOW.
PENTACHLOROPYRIDINE	DOW.
1,1,3,3,5-PENTAMETHYLINDAN	GIV.
ORTHO-PENTYLPHENOL	PAS.
PARA-TERT-PENTYLPHENOL	EK, PAS.
3,4,9,10-PERYLENETETRACARBOXYLIC-3,4:9,10-DIIMIDE	ACS.
2-PHENETHYLAMINE	MLS.
ALPHA-PHENETHYLAMINE	MLS.
PARA-PHENETIDINE	MON.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@PHENOL:	
NATURAL:	
FROM COAL TAR:	
NATURAL PHENOL FROM COAL TAR, 39 DEGREES C., M.P.	PRD.
NATURAL PHENOL FROM COAL TAR, ALL OTHER	KPT, SW(E).
FROM PETROLEUM:	
NATURAL PHENOL FROM PETROLEUM, ALL OTHER	MER, PRD.
SYNTHETIC:	
SYNTHETIC PHENOL BY CAUSTIC FUSION, U.S.P.	RCI, TOC.
@SYNTHETIC PHENOL FROM CUMENE BY OXIDATION, U.S.P.	ACS, CLK, DOW, GP, MON, SHC, SOC, UCC, USS.
PHENOL FROM TOLUENE BY OXIDATION U.S.P.	KLM.
PHENOLSULFONAPHTHALEIN, SODIUM SALT	EK.
PHENOLSULFONIC ACID, LITHIUM SALT	SAL.
PHENOXYACETIC ACID, SODIUM SALT	SAL, SFS.
ORTHO-PHENOXYMETHYLBENZOIC ACID	PFZ.
PHENYLACETIC ACID	SFS.
PHENYLACETIC ACID, ETHYL ESTER, TECH.	OPC, SFS.
PHENYLACETIC ACID, POTASSIUM SALT	OPC, SFS.
PHENYLACETIC ACID, SODIUM SALT	OPC, SFS.
PHENYLACETONITRILE	OPC, SFS, UOP.
4'-PHENYLACETOPHENONE	DUP.
PARA-PHENYLAZOANILINE (C.I. SOLVENT YELLOW 1) AND HYDROCHLORIDE	ACY, DUP.
4-(PHENYLAZO)DIPHENYLAMINE	EK.
ALPHA-PHENYL-ORTHO-CRESOL	RBC.
META-PHENYLENEDIAMINE	DUP.
ORTHO-PHENYLENEDIAMINE	DUP, SW(E), TRC.
PARA-PHENYLENEDIAMINE	DUP, SDC.
D-PHENYLEPHRINE	SDW.
DL-PHENYLEPHRINE BASE	SDW.
PHENYL ETHER	DOW.
D(-)-PHENYLGLYCINE	OTC(E).
D(-)-2-PHENYLGLYCINE	DUP, KF, UPJ.
D(-)-2-PHENYLGLYCINE POTASSIUM ETHYL DANE SALT	UPJ.
DL-2-PHENYLGLYCINE	KF, OTC(E).
D(-)-2-PHENYLGLYCINE CHLORIDE HYDROCHLORIDE	KF, OTC(E), UPJ.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
PHENYLGLYCINE, SODIUM SALT	LIL.
N-PHENYLGLYCINE, SODIUM AND POTASSIUM SALTS	ACS.
5-PHENYLHYDANTOIN	ABB.
@2,2'-*(PHENYL)IMINO*DIETHANOL	EKT, MIL, TCH.
PHENYLMALONIC ACID, DIETHYL ESTER	SFS.
PHENYLMALONIC ACID	X.
3-PHENYL-5-METHYLISOXAZOLE-4-CARBONYL CHLORIDE	ARS.
N-PHENYL-2-NAPHTHYLAMINE	DUP.
ORTHO-PHENYLPHENOL	DOW, RCI.
PARA-PHENYLPHENOL	DOW.
ORTHO-PHENYLPHENOL, CHLORINATED	DOW.
ORTHO-PHENYLPHENOL, SODIUM SALT	DOW.
N-PHENYL-PARA-PHENYLENEDIAMINE	USR.
PHENYLPHOSPHINIC ACID	SFS.
PHENYLPHOSPHONOTHIOIC DICHLORIDE	SFA.
PHENYLPHOSPHOROUS DICHLORIDE	SFA.
1-PHENYL-1,2-PROPANEDIONE, 2-OXIME	ORT.
PHENYL-2-PROPANONE	ORT, SK.
1-PHENYL-3-PYRAZOLIDINONE	EK.
PHENYL SALICYLATE	DOW.
4-PHENYLSULFINYL-1,2-PHENYLENEDIAMINE	ARA.
PHENYLUNDECANOIC ACID	EK.
1(2H)-PHTHALAZINONE	SDH.
PHTHALIC ACID	EK.
PHTHALIC ACID, DIALLYL ESTER	FMP(E).
@PHTHALIC ANHYDRIDE	ACS, BAS, ENJ(E), HK, KPT, MON, PTO, SOC, STP, USS.
PHTHALIMIDE	SW(E).
*PHTHALOCYANINATO(2-)*COPPER	DUP.
PHTHALOYL CHLORIDE	DUP, MON.
PICOLINES:	
@2-PICOLINE (ALPHA PICOLINE)	KPT, RIL(E), UCC.
3-PICOLINE	NEP, RIL(E).
4-PICOLINE	NEP, RIL(E), UCC.
PICOLINE	KPT.
3-PICOLYLAMINE	RIL(E).
PICRIC ACID	SDC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@PIPERIDINE	ABB, DUP, RIL(E).
3-PIPERIDINOPROPIOPHENONE HYDROCHLORIDE	ACY.
POLYCHLOROBENZENE	DOW.
POLYCHLOROBIPHENYL	MON.
PCLYETHYLBENZENE	ELP, UCC.
PROPIOPHENONE	ORT, UOP.
8,16-PYRANTHRENEDIONE	TRC.
PYRIDINE, REFINED:	
PYRIDINE, REFINED ALL OTHER GRADES	KPT.
2 DEGREE PYRIDINE, REFINED	KPT, NEP.
PYRIDINE HYDROCHLORIDE	EK.
3-PYRIDINEMETHANOL	RIL(E).
2-PYRIMIDINOL	CGY(E).
2-PYRROLIDINONE	GAF.
QUINALDINE	ACS, ACY.
QUINOLINE:	
QUINOLINE, 1 DEGREE AND 2 DEGREE	KPT.
QUINOLINE, OTHER GRADES (SPECIFY)	KPT.
QUINOPHTHALONE	ACS.
RESORCINOL, TECH.	KPT.
BETA-RESORCYLIC ACID	HST, KPT.
@SALICYLALDEHYDE	DOW, RDA, SHC.
SALICYLALDEHYDE OXIME	EK.
SALICYLIC ACID, AMMONIUM CHROMIUM COMPLEX	TRC.
@SALICYLIC ACID, TECH.	DOW, HN, MON, SDH.
SALICYLIDENEAMINOGUANIDINE OLEATE	DUP.
SULFANILIC ACID (PARA-AMINOBENZENESULFONIC ACID) AND SALT	ACY.
4-SULFOANTHRANILIC ACID	TRC.
4,4'-SULFONYLDIPHENOL	UPF.
4-SULFOPHTHALIC ACID	CWN, HSC.
TEREPHTHALIC ACID	ACC, DUP, SDH.
@TEREPHTHALIC ACID, DIMETHYL ESTER	ACC, DUP, EKT, HPC, HST.
TEREPHTHALOYL CHLORIDE	DUP.
TEREPHTHALOYLDIACETIC ACID, DIETHYL ESTER	PCW.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TERPHENYL (PHENYLBIPHENYL) (META-,ORTHO-,AND PARA-ISOMERS)	MON.
TETRABROMOPHTHALIC ANHYDRIDE	VEL.
1,4,5,8-TETRACHLOROANTHRAQUINONE	DUP.
1,2,4,5-TETRACHLOROBENZENE	DOW.
1,2,4,5-TETRACHLORO-3-NITROBENZENE	SDH.
TETRACHLOROPYRIDINE	ABB, DOW.
TETRACHLOROPHTHALICANHYDRIDE	ABB, X.
TETRAHYDROFURAN	GAF, QKO.
TETRAHYDROFURFURYL DIMETHACRYLATE	SAR.
1,4,5,8-TETRAHYDROXYANTHRAQUINONE, LEUCO DERIVATIVE	TRC.
1,2,4,5-TETRAMETHYLBENZENE	SNT(E).
PARA-(1,1,3,3-TETRAMETHYLBUTYL)PHENOL	GAF.
N,N,N',N'-TETRAMETHYL-PARA-PHENYLENEDIAMINE, DIHYDROCHLORIDE	EK.
2-(2-THENYLAMINO)PYRIDINE	ABB.
THIANTHRENE	X.
2-THIOPHENECARBOXALDEHYDE	ABB.
THIOPHENOL	SFA.
SYM-THYMOL	GIV, KPT.
@TOLUENE-2,4-DIAMINE	ACS, ACY, DUP, OMC, RUC, UCC.
PARA-TOLUENESULFINIC ACID, SODIUM SALT	NES.
PARA-TOLUENESULFONAMIDE	MON.
CRTHO(AND PARA)-TOLUENESULFONIC ACID	MON, UPF.
PARA-TOLUENESULFONIC ACID	NES, TEN.
PARA-TOLUENESULFONIC ACID MONOHYDRATE	UPF.
PARA-TOLUENESULFONYL CHLORIDE	MON.
TOLUENESULFONYL FLUORIDE	EK.
PARA-TOLUIC ACID	SFS.
PARA-TOLUIC ACID, METHYL ESTER	DUP.
META-TOLUIDINE	DUP.
CRTHO-TOLUIDINE	DUP, FST.
PARA-TOLUIDINE	DUP.
TOLUIDINES, MIXED	DUP.
2-ORTHO-TOLUIDINOETHANOL	TCH.
ORTHO-TOLUIDINOMETHANESULFONIC ACID	TRC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-(ORTHO-TOLYLAZO)-ORTHO-TOLUIDINE (C.I. SOLVENT YELLOW 3)	ACY, ALL, DUP.
1-PARA-TOLYLDODECANE	X.
PARA-TOLYLHYDROQUINONE	X.
2,2'-(META-TOLYLIMINO)DIETHANOL	EKT, MIL, TCH.
TOLYLTRIAZOLE	SW(E).
2,3,6-TRIAMINO-5-NITROSO PYRIMIDINE	SK.
N,N,N-TRIBENZYLAMINE	MLS.
3,4',5-TRIBROMOSALICYLANILIDE	PCW.
2,4,6-TRICHLOROANALINE	UPJ.
2,4,6-TRICHLOROANILINE	CWN.
1,2,3(AND 1,2,4)-TRICHLOROBENZENE	PPG.
1,2,4-TRICHLOROBENZENE	DOW, X.
2,4,5-TRICHLOROBENZENESULFONIC ACID, SODIUM SALT	X.
1,1,1-TRICHLORO-2,2-DIPHENYLETHANE	CWN.
1,2,4-TRICHLORO-5-NITROBENZENE	ALL, PCW.
TRICHLOROPHENYLSILANE	DCC.
ALPHA,ALPHA,ALPHA-TRICHLOROTOLUENE	HK, VEL.
ALPHA,2,4-TRICHLOROTOLUENE	HN.
2,4,6-TRICHLORO-S-TRIAZINE	CGY(E), NIL.
ALPHA,ALPHA',ALPHA''-TRIS(DIMETHYLAMINO)MESITOL	RH.
4-4-TRIFLUORO-1-TRIFLUOROMETHYL-ETHYLIDENE-DIPHENOL	DUP.
TRIMESIC ACID	AMB.
1,2,4-TRIMETHYLBENZENE	SNT(E).
1,3,5-TRIMETHYLBENZENE	SNT(E).
3,3,5-TRIMETHYLCYCLOHEXANOL (META-HOMOMENTHOL)	ARS.
2,3,3-TRIMETHYL-3H-INDOLE	GAF, VPC.
1,3,3-TRIMETHYL-2-METHYLENEINDOLINE	DUP, GAF, VPC.
TRIMETHYLPHENYLAMMONIUM CHLORIDE	X.
TRIMETHYLPHENYLAMMONIUM IODIDE	EK, TRC.
2,4,6-TRIMETHYLPYRIDINE	KPT.
2,4,7-TRINITROFLUOREN-9-ONE	WAY.
1,3,3-TRIMETHYL-DELTA2/, ALPHA-INDOLINEACETALDEHYDE	DUP, GAF, TRC, VPC.
TRIPHENYLMETHANE	EK.
2,4,6-TRIPROPOXYBENZALDEHYDE	X.
TRIS(2-METHYL-1-AZIRIDINYL)PHOSPHINE OXIDE	ARS.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
2,4,6-TRI-NORMAL-PROPOXYBENZALDEHYDE	CWN.
TRI-NORMAL-PROPOXYBENZALDEHYDE	CWN.
@7,7'-UREYLENEBIS*4-HYDROXY-2-NAPHTHALENESULFONIC ACID*	DUP, GAF, TRC.
PARA-VINYLBENZENESULFONIC ACID, SODIUM SALT	DUP.
5-VINYl-2-PICOLINE	PLC.
2-VINYLPYRIDINE	RIL(E).
4-VINYLPYRIDINE	RIL(E).
VINYLTOLUENE (FOSTASOL)	FG.
VIOLANTHRONE	ACS, DUP, TRC.
XANTHENE-9-CARBOXYLIC ACID	MAL.
XYLENESULFONIC ACID, MIXED ISOMERS	NES.
2,6-XYLENOL	GE, KPT.
XYLIDINES:	
2,6-XYLIDINE	DUP.
2,4-XYLIDINE	DUP.
XYLIDINE, ORIGINAL MIXTURE	DUP.
4-(2,5-XYLYLAZO)-ORTHO-TOLUIDINE	ACY.
@CYCLIC INTERMEDIATES, ALL OTHER	ABB, ACS, ACY, ALD, ALL, ARS, CWN, DOW, DUP, EK, EKT, HST, ICI, KF, LEM, LIL, MLS, OPC, PCW, PD, PFZ, PIT, PRD, PTT, RH, SDC, SDH, SDW, STC, SW(E), TCC, TCH, UCC, UCC, UPJ, UPJ, USR, VAL, VEL, VPC, VTC, WAY, X X, X, X, X, X, X.

TABLE 3.--Cyclic intermediates: Directory of manufacturers, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of cyclic intermediates to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
ABB	Abbott Laboratories
AC	American Color & Chemical Corp.
ACC	Amoco Chemical Corp.
ACS	Allied Chemical Corp., Specialty Chemicals Div.
ACY	American Cyanamid Co.
ADC	Anderson Development Co.
AIP	Air Products & Chemicals, Inc.
ALD	Aldrich Chemical Co., Inc.
ALF	Allied Chemical Corp., Fibers Div.
ALL	Alliance Chemicals, Inc.
AMB	American Bio-Synthetics Corp.
ARA	Araphahoe Chemical, Inc. Sub/Syntex Corp. (U.S.A.)
ARK	Armstrong Cork Co.
ARS	Arsynco, Inc.
ARZ	Arizona Chemical Co.
ASH	Ashland Oil, Inc., Ashland Chemical Co.
ASL	Ansul Chemical Co.
ATR	Atlantic Richfield Co.
BAS	BASF Wyandotte Corp.
BJL	Burdick & Jackson Laboratories, Inc.
BUC	Synalloy Corp., Blackman-Uhler Chemical Div.
CCW	Cincinnati Milacron Chemicals, Inc.
CEL	Celanese Corp., Celanese Chemical Co.
CGY	Ciba-Geigy Corp.
CHL	Chemol, Inc.
CLK	Clark Chemical Corp.
CMG	Nyanza, Inc.
CNP	Nipro, Inc.
CO	Continental Oil Co.
CRS	Carus Chemical Co.
CSD	Cosden Oil & Chemical Co.
CWN	Upjohn Co., Fine Chemicals Div.
DBC	Dow Badische Co.
DCC	Dow Corning Corp.
DOW	Dow Chemical Co.
DUP	E.I. duPont de Nemours & Co., Inc.
DVC	Dover Chemical Corp. Sub of ICC Industries, Inc.
EGR	Eagle River Chemical Corp.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
ELP	El Paso Products Co.
ENJ	Exxon Chemical Co. U.S.A.
FER	Ferro Corp., Ottawa Chemical Div.
FG	Foster Grant Co., Inc.
FIN	Hexcel Corp., Fine Organics Div.
FMP	FMC Corp., Industrial Chemical Div.
FMT	Fairmount Chemical Co., Inc.
FST	First Chemical Corp.
GAF	GAF Corp., Chemical Div.
GE	General Electric Co.
GIV	Givaudan Corp.
GLY	Glyco Chemicals, Inc.
GNT	General Tire & Rubber Co., Chemical/Plastics Div.
GOC	Gulf Oil Corp., Gulf Oil Co., Chemical Co.-U.S.
GP	Georgia-Pacific Corp., Rebecca Chemical Div.
GYR	Goodyear Tire & Rubber Co.
HEX	Hexagon Laboratories, Inc.
HK	Hooker Chemicals & Plastics Corp.
HN	Tenneco Chemicals, Inc.
HPC	Hercules, Inc.
HSC	Chemetron Corp., Pigments Div.
HSH	Harshaw Chemical Co. Div. of Kewanee Oil Co.
HST	American Hoechst Corp.: Hoechst Fibers Industries Rhode Island Works
ICC	Inmont Corp.
ICI	ICI United States, Inc., Specialty Chemicals Group
IMC	IMC Chemical Group, Inc.
JCC	Jefferson Chemical Co., Inc.
KF	Kay-Fries Chemicals, Inc.
KLM	Kalama Chemical, Inc.
KPT	Koppers Co., Inc., Organic Materials Div.
LAK	Lakeway Chemicals, Inc.
LEM	Napp Chemicals, Inc.
LIL	Eli Lilly & Co. and Puerto Rico
MAL	Mallinckrodt Chemical Works
MAY	Otto B. May, Inc.
MCB	Borg-Warner Corp.: Marbon Chemical Div. Weston Chemical Co.
MER	Merichem Co.
MIL	Milliken Co., Milliken Chemical Div.
MLC	Melamine Chemicals, Inc.
MNR	Monroe Chemical Co.
MOB	Mobay Chemical Co.
MON	Monsanto Co.
MRA	Bostik South, Inc.
MRK	Merck & Co., Inc.
MRT	Morton Chemical Co. Div. of Morton Norwich Products, Inc.
MTO	Montrose Chemical Corp. of California
NCI	Union Camp Corp.
NEP	Nepera Chemical Co., Inc.
NES	Nease Chemical Co., Inc.
NIL	Nilok Chemicals, Inc.
NOR	Norwich Parmacal Co.
NPC	Northwest Petrochemical Corp.

TABLE 3.--CYCLIC INTERMEDIATES: DIRECTORY OF MANUFACTURERS, 1976--CONTINUED

Code	Name of company
OMC	Olin Corp.
OPC	Orbis Products Corp.
ORO	Chevron Chemical Co.
ORT	Roehr Chemicals, Inc.
OTC	Story Chemical Corp., Ott Div.
PAS	Pennwalt Corp.
PCW	Pfister Chemical, Inc.
PD	Parke, Davis & Co. Sub. of Warner-Lambert Co.
PFZ	Pfizer, Inc. & Pfizer Pharmaceutical, Inc.
PIT	Pitt-Consol Chemical Co.
PLC	Phillips Petroleum Co.
PPG	PPG Industries, Inc.
PRD	Ferro Corp., Productol Chemical Div.
PTO	Puerto Rico Chemical Co., Inc.
PTT	Petro-Tex Chemical Corp.
QKO	Quaker Oats Co.
RBC	Fike Chemicals, Inc.
RCI	Reichhold Chemicals, Inc.
RDA	Rhodia, Inc.
RH	Rohm & Haas Co.
RIL	Reilly Tar & Chemical Corp.
RPC	Millmaster Onyx Corp., Refined-Onyx Div.
RSA	R.S.A. Corp.
RUC	Rubicon Chemicals, Inc.
SAL	Salsbury Laboratories
SAR	Sartomer Industries, Inc.
SCC	Standard Chlorine of Delaware, Inc.
SCN	Schenectady Chemicals, Inc.
SDC	Martin-Marietta Corp., Sodyeco Div.
	Sterling Drug, Inc.:
SDH	Hilton-Davis Chemical Co. Div.
SDW	Winthrop Laboratories Div.
	Stauffer Chemical Co.:
SFA	Agricultural Div.
SFC	Calhio Chemicals, Inc.
SFS	Specialty Chemical Div.
SHC	Shell Oil Co., Shell Chemical Co. Div.
SK	Smith, Klein & French Laboratories
SKO	Getty Refining & Marketing Co.
SNT	Suntide Refining Co.
SOC	Standard Oil Co. of California, Chevron Chemical Co.
STC	American Hoechst Corp., Sou-Tex Works
STG	Stange Co.
STP	Stepan Chemical Co.
STY	Styrochem Corp.
SW	Sherwin-Williams Co.
TCC	Tanatex Chemical Corp.
TCH	Emery Industries, Inc., Trylon Chemical Div.
TEN	Cities Service Co., Copperhill Operations
TKL	Thiokol Corp.
TNA	Ethyl Corp.
TOC	Tenneco Oil Co.
TRC	Toms River Chemical Corp.
TRD	Manufacturing Enterprises, Inc., Squibb Manufacturing, Inc., Trade Enterprise, Inc., Ersana, Inc.
TX	Texaco, Inc.
UCC	Union Carbide Corp.
UOP	UOP, Inc., UOP Chemical Div.
UPF	Jim Walter Resources, Inc.
UPJ	Upjohn Co.
USR	Uniroyal, Inc., Chemical Div.
USS	USS Chemicals Div. of U.S. Steel Corp.
VAL	Valchem Corp.
VGC	Virginia Chemicals, Inc.
VPC	Mobay Chemical Corp., Verona Div.
VTC	Vicksburg Chemical Co. Div. of Vertac Consolidated
WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.
WIL	Inolex Corp., Inolex Pharmaceutical Div.
WTC	Witco Chemical Co., Inc.
WTH	Union Camp Corp., Chemical Div., Dover Plant
WTL	Pennwalt Corp., Lucidol Div.
WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

DYES

Edmund Cappuccilli

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 the dyeing of leather and plastics. Of the several thousand different synthetic dyes that are known, more than one thousand are manufactured by one or more domestic producers. 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 costs that a particular use can bear. Dyes are sold as pastes, powders, lumps, and solutions; concentrations vary from 6 percent to 100 percent. The concentration, form, and purity of a dye are determined largely by the use for which it is intended.

Total domestic production of dyes in 1976 amounted to 256 million pounds, or 24.4 percent greater than the 206 million pounds produced in 1975 (table 1). Sales of dyes in 1976 amounted to 250 million pounds, valued at $620 million, compared with 209 million pounds, valued at $476 million, in 1975. In terms of quantity, sales of dyes in 1976 were 19.7 percent greater than in 1975 and in terms of value, 30.4 percent greater. The average unit value of sales of all dyes in 1976 was $2.48 per pound compared with $2.28 per pound in 1975.

In general, the production of the six classes of dyes increased substantially in 1976. Acid dyes increased by 50.5 percent from 18.7 million pounds in 1975 to 28.2 million in 1976. The other five classes of dyes increased by the following percentages: basic dyes (24.5), direct dyes (32.3), disperse dyes (13.7), fluorescent brightening agents (13.0), and vat dyes (25.4).

TABLE 1.--Dyes: U.S. production and sales, 1976

[Listed below are all dyes for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists all dyes for which data on production and/or sales were reported and identifies the manufacturers of each]

DYE	PRODUCTION	SALES QUANTITY	SALES VALUE	SALES UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	256,250	249,887	620,294	$2.48
Total	28,248	27,006	87,108	3.23
Acid yellow dyes, total	9,432	9,056	25,345	2.80
Acid Yellow 17	177	150	460	3.06
Acid Yellow 23	243	181	685	3.78
Acid Yellow 34	13	29	99	3.36
Acid Yellow 36	132	131	410	3.13
Acid Yellow 40	...	95	409	4.29
Acid Yellow 151	2,120	2,245	4,117	1.83
Acid Yellow 159	...	394	1,142	2.90
Acid Yellow 174	113	...	...	...
All other	6,634	5,831	18,023	3.09
Acid orange dyes, total	4,113	3,935	11,634	2.96
Acid Orange 7	326	370	801	2.16
Acid Orange 8	257	228	497	2.19
Acid Orange 10	232	235	556	2.37
Acid Orange 24	709	749	1,708	2.28
Acid Orange 60	404	388	1,214	3.13
Acid Orange 116	551	455	1,489	3.28
All other	1,634	1,510	5,369	3.56
Acid red dyes, total	4,932	4,853	16,117	3.32
Acid Red 1	377	405	908	2.24
Acid Red 4	69	60	215	3.59
Acid Red 37	22	14	60	4.36
Acid Red 73	105	139	584	4.22
Acid Red 85	72	75	229	3.07
Acid Red 114	314	275	1,014	3.68
Acid Red 137	129	108	594	5.48
Acid Red 151	821	704	1,809	2.57
Acid Red 182	83	84	286	3.41
Acid Red 186	...	26	152	5.90
Acid Red 266	188	194	767	3.95
Acid Red 337	864	798	347	4.34
All other	1,888	1,971	9,152	4.64
Acid violet dyes, total	132	160	659	4.11
Acid violet 7	...	10	29	2.87
All other	132	150	630	4.20
Acid blue dyes, total	4,575	4,401	18,038	4.10
Acid Blue 9	...	1,420	2,461	1.73
Acid Blue 25	643	630	3,725	5.91
Acid Blue 27	52	42	226	5.43
Acid Blue 40	688	676	3,207	4.74
Acid Blue 113	468	419	1,443	3.44
All other	2,724	1,214	6,976	5.75
Acid green dyes	485	442	1,907	4.31
Acid brown dyes, total	1,385	1,275	4,647	3.65
Acid Brown 14	407	490	1,627	3.32
All other	978	785	3,020	3.85
Acid black dyes, total	3,194	2,884	8,761	3.04
Acid Black 1	556	450	1,191	2.65
Acid Black 52	756	620	1,844	2.98

See footnotes at end of table.

TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1976--CONTINUED

DYE	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
ACID DYES--CONTINUED	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Acid black dyes--Continued				
Acid Black 107	267	280	1,175	$4.20
All other	1,615	1,534	4,551	2.97
AZOIC DYES AND COMPONENTS				
Azoic Diazo Components, Bases (Fast Color Bases)				
Azoic Diazo Components, Bases (Fast Color Bases), total	532	467	989	2.12
Azoic Diazo Components, Salts (Fast Color Salts)				
Total	1,370	1,350	1,572	1.16
Azoic Diazo Component 5, salt	...	65	96	1.47
Azoic Diazo Component 6, salt	75	...	...	...
Azoic Diazo Component 9, salt	211	223	201	.90
Azoic Diazo Component 13, salt	263	238	275	1.16
All other azoic diazo components, salts	821	824	1,000	1.21
BASIC DYES				
Total	14,595	14,889	49,770	3.34
Basic yellow dyes, total	4,804	4,540	13,294	3.30
Basic Yellow 11	885	737	1,810	2.45
Basic Yellow 13	236	212	500	2.36
All other	3,683	3,591	10,984	3.06
Basic orange dyes, total	1,446	1,472	4,024	2.73
Basic Orange 2	488	497	1,177	2.37
Basic Orange 21	578	527	1,414	2.68
All other	380	448	1,433	3.20
Basic red dyes, total	2,059	2,387	8,555	4.73
Basic Red 14	497	571	1,156	2.03
Basic Red 18	253	517	1,229	2.83
Basic Red 49	...	82	309	3.75
All other	1,309	1,217	5,861	4.82
Basic violet dyes, total	3,357	3,232	10,696	3.35
Basic Violet 1	1,256	1,072	3,194	2.98
Basic Violet 16	316	370	1,129	3.05
All other	1,785	1,790	6,373	3.56
Basic blue dyes, total	2,187	2,328	10,360	4.81
Basic Blue 7	64	101	710	7.01
All other	2,123	2,227	9,650	4.33
Basic green dyes	275	428	1,545	3.61
All other basic dyes	467	502	1,296	2.58
DIRECT DYES				
Total	33,527	31,606	78,772	2.49
Direct yellow dyes, total	12,004	11,393	28,258	2.48
Direct Yellow 4	585	561	1,086	2.14
Direct Yellow 6	255	245	647	2.64
Direct Yellow 11	2,655	2,593	3,015	1.16
Direct Yellow 12	39	52	320	6.20

See footnotes at end of table.

TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1976--CONTINUED

DYES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
DIRECT DYES	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Direct yellow dyes--continued				
Direct Yellow 28	82	79	394	$4.99
Direct Yellow 44	620	585	1,710	2.92
Direct Yellow 50	536	546	1,850	3.39
Direct Yellow 84	236	255	629	2.47
Direct Yellow 105	164	...	...	...
Direct Yellow 106	803	714	1,852	2.60
All other	6,029	5,763	16,755	2.91
Direct orange dyes, total	1,620	1,580	4,358	2.76
Direct Orange 8	...	83	155	1.86
Direct Orange 15	...	467	694	1.49
Direct Orange 34	...	61	195	3.20
Direct Orange 39	111	124	367	2.96
Direct Orange 72	289	250	681	2.73
Direct Orange 73	...	91	343	3.75
Direct Orange 102	290	223	802	3.60
All other	930	281	1,121	3.99
Direct red dyes, total	4,489	3,962	12,514	3.16
Direct Red 1	62	82	251	3.07
Direct Red 2	75	57	219	3.85
Direct Red 23	185	163	641	3.93
Direct Red 24	240	24	773	3.62
Direct Red 26	...	37	115	3.13
Direct Red 39	...	50	215	4.34
Direct Red 72	303	281	972	3.46
Direct Red 80	512	404	1,323	3.27
Direct Red 81	637	644	2,094	3.25
Direct Red 83	151	135	367	2.71
All other	2,324	2,085	5,544	2.66
Direct violet dyes	152	172	601	3.52
Direct blue dyes, total	7,266	6,711	19,069	2.84
Direct Blue 1	236	230	915	3.89
Direct Blue 2	771	771	1,476	1.92
Direct Blue 76	58	41	120	2.91
Direct Blue 80	491	471	1,423	3.02
Direct Blue 86	1,039	862	2,550	2.96
Direct Blue 98	139	164	489	2.98
Direct Blue 218	1,359	1,253	3,973	3.17
All other	3,173	2,919	8,123	2.78
Direct green dyes, total	371	455	1,511	3.32
Direct Green 1	169	216	457	2.12
All other	202	239	1,054	4.41
Direct brown dyes, total	1,548	1,491	3,068	2.06
Direct Brown 2	188	198	471	2.38
Direct Brown 31[2]	47	42	183	4.39
Direct Brown 95[2]	595	532	1,102	2.07
All other	718	719	1,312	1.82
Direct black dyes, total	6,077	5,842	9,393	1.61
Direct Black 22	1,499	1,186	1,351	1.14
Direct Black 38	3,759	3,923	6,249	1.59
All other	819	733	1,793	2.45
DISPERSE DYES				
Total	39,100	36,289	138,018	3.80
Disperse yellow dyes, total	7,112	7,066	19,916	2.82
Disperse Yellow 3	1,161	1,095	2,467	2.25

See footnotes at end of table.

TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1976--CONTINUED

DYES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
DISPERSE DYES--CONTINUED	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Disperse yellow dyes--Continued				
Disperse Yellow 23	753	782	1,499	1.92
Disperse Yellow 33	194	163	353	2.17
Disperse Yellow 34	126	166	365	2.19
Disperse Yellow 42	605	666	1,487	2.23
Disperse Yellow 54	893	1,059	3,422	3.23
All other	3,380	3,135	10,323	3.29
Disperse orange dyes, total	4,993	4,526	11,854	2.62
Disperse Orange 3	106	81	217	2.67
Disperse Orange 17	78	62	106	1.72
Disperse Orange 25	821	607	1,555	2.56
All other	3,988	3,776	9,976	2.64
Disperse red dyes, total	9,271	8,280	36,501	4.41
Disperse Red 1	399	294	735	2.50
Disperse Red 5	106	83	180	2.17
Disperse Red 15	...	42	199	4.74
Disperse Red 17	358	294	741	2.52
Disperse Red 60	2,263	2,047	7,651	3.74
Disperse Red 65	121	155	495	3.20
Disperse Red 86	48	27	189	6.93
Disperse Red 177	218	183	652	3.57
All other	5,758	5,155	25,659	4.98
Disperse violet dyes, total	433	505	2,270	4.49
Disperse Violet 1	...	35	179	5.06
Disperse Violet 27	57	97	247	2.56
All other	376	373	1,844	4.94
Disperse blue dyes, total	14,081	13,069	59,895	4.58
Disperse Blue 3	1,155	877	2,556	2.91
Disperse Blue 64	516	468	1,230	2.63
Disperse Blue 79	2,622	2,082	5,883	2.83
All other	9,788	9,642	50,226	5.21
Disperse black dyes	1,612	1,422	2,969	2.09
Disperse brown and green dyes	1,598	1,421	4,613	3.47
FIBER-REACTIVE DYES				
Fiber-reactive dyes, total	3,506	3,982	21,876	5.49
Reactive yellow dyes	844	804	4,647	5.78
All other reactive dyes	2,662	3,178	17,229	5.42
FLUORESCENT BRIGHTENING AGENTS				
Fluorescent brightening Agent, total	43,429	37,948	55,464	1.46
Fluorescent Brightening Agent 28	2,371	2,220	4,391	1.98
Fluorescent Brightening Agent 61	85	607	616	10.16
All other fluorescent brightening agents	40,973	35,121	50,457	1.44
FOOD, DRUG, AND COSMETIC COLORS				
Total	5,757	5,110	31,754	6.21
Food, Drug, and Cosmetic Dyes				
Total	5,456	4,815	28,457	5.91
FD&C Blue No. 1	177	171	1,448	8.48
FD&C Blue No. 2	64	76	912	11.93
FD&C Red No. 2	54	91	458	5.02
FD&C Red No. 3	506	447	4,410	9.87
FD&C Yellow No. 5	1,673	1,403	6,573	4.68
FD&C Yellow No. 6	1,188	991	4,226	4.26
All other food, drug, and cosmetic dyes	1,794	1,636	10,430	6.38

See footnotes at end of table.

TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1976--CONTINUED

DYES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
Drug and Cosmetic and External Drug and Cosmetic Dyes	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Total	301	295	3,297	$10.74
D&C green dyes	18	23	549	21.22
D&C red dyes, total	162	171	1,451	13.57
D&C Red No. 6	...	27	217	8.12
D&C Red No. 7	...	28	180	6.37
D&C Red No. 19	8	10	116	11.43
All other	154	106	938	8.85
All other drug & cosmetic and external drug & cosmetic dyes	121	101	1,297	12.84
MORDANT DYES				
Total	660	656	2,149	3.28
Mordant orange dyes, total	137	129	360	2.78
Mordant orange 1	57	43	118	2.72
All other	80	86	242	2.81
Mordant brown dyes	172	164	628	3.83
Mordant black dyes, total	256	309	910	2.95
Mordant Black 11	...	231	705	3.05
All other	256	78	205	2.63
All other mordant dyes	95	54	251	4.65
SOLVENT DYES				
Total	11,940	11,509	35,341	3.07
Solvent yellow dyes	1,417	1,396	4,880	3.50
Solvent orange dyes	888	931	2,852	3.06
Solvent red dyes, total	2,730	2,993	8,466	2.83
Solvent Red 49	58	87	747	8.63
All other	2,672	2,906	7,719	2.66
Solvent blue dyes	2,413	1,628	11,132	6.84
All other solvent dyes	4,492	4,561	8,011	1.76
VAT DYES				
Total	53,231	59,077	86,876	1.47
Vat yellow dyes, total	1,254	969	3,657	3.77
Vat Yellow 2, 8-1/2%	656	394	686	1.74
All other	598	575	2,971	5.17
Vat orange dyes, total	2,761	2,593	12,090	4.66
Vat Orange 2, 12%	787	741	3,237	4.37
Vat Orange 15, 10%	...	220	947	4.31
All other	1,974	1,632	7,906	4.84
Vat red dyes	393	378	1,886	5.00
Vat violet dyes	307	328	1,312	4.00
Vat green dyes, total	5,399	5,464	10,275	1.88
Vat Green 1, 6%	...	1,073	2,034	1.90
Vat Green 3, 10%	1,748	1,843	3,477	1.89
All other	3,651	2,548	4,764	1.87
Vat brown dyes	4,202	4,041	12,996	3.22

See footnotes on following page.

TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1976--CONTINUED

DYES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
VAT DYES--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Vat black dyes, total	3,519	3,534	6,200	$1.75
Vat Black 25, 12-1/2%	1,840	1,996	3,329	1.67
Vat Black 27, 12-1/2%	360	239	731	3.05
All other	1,319	1,299	2,140	1.65
All other vat dyes	35,396	41,770	38,460	.92
All other dyes[3]	20,355	19,998	30,605	1.53

[1] Calculated from rounded figures.
[2] The data include dyes which are similar to, but not chemically identical with, the indicated Colour Index name.
[3] The data include azoic compositions, azoic coupling components, oxidation bases, ingrain dyes, sulfur dyes, and miscellaneous dyes. Statistics for those groups of dyes may not be published separately because publication would disclose information received in confidence.

TABLE 1A.--DYES: U.S. PRODUCTION AND SALES, BY CLASS OF APPLICATION, 1976

CLASS OF APPLICATION	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Total	256,250	249,887	620,294	$2.48
Acid	28,248	27,006	87,108	3.23
Azoic dyes and components:				
Azoic diazo components, bases (Fast color bases)	532	467	989	2.12
Azoic diazo components, salts (Fast color salts)	1,370	1,350	1,572	1.16
Basic	14,595	14,889	49,770	3.34
Direct	33,527	31,606	78,772	2.49
Disperse	39,100	36,289	138,019	3.80
Fiber-reactive	3,506	3,982	21,876	5.49
Fluorescent brightening agents	43,429	37,948	55,464	1.46
Food, drug, and cosmetic colors	5,757	5,110	31,754	6.21
Mordant	660	656	2,149	3.28
Solvent	11,940	11,509	35,341	3.07
Vat	53,231	59,077	86,876	1.47
All Other[2]	20,355	19,998	30,604	1.53

[1] Calculated from rounded figures.
[2] The data include azoic composition, azoic coupling components, oxidation base, ingrain dyes, sulfur dyes, and miscellaneous dyes. Statistics for these groups of dyes may not be published separately because publication would disclose information received in confidence.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS' IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AN "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C I D D Y E S	
@ACID YELLOW DYES:	
ACID YELLOW 1	ACY.
ACID YELLOW 3	ACS, ACY.
ACID YELLOW 11	ATL(E).
ACID YELLOW 14	TRC.
@ACID YELLOW 17	AC, ATL(E), BDO, SDH, TRC, VPC.
ACID YELLOW 19	AC, ALT, BAS, ICI.
@ACID YELLOW 23	AC, ACY, ALT, GAF, MRX, PDC, TRC, VPC, WJ.
ACID YELLOW 25	GAF.
ACID YELLOW 29	TRC.
@ACID YELLOW 34	AC, ACS, ATL(E), PDC.
@ACID YELLOW 36	DUP, GAF, TRC.
ACID YELLOW 38	ATL(E), GAF.
@ACID YELLOW 40	ACY, ALT, ATL(E), TRC.
ACID YELLOW 42	ACY, GAF.
ACID YELLOW 44	GAF.
ACID YELLOW 49	DUP, VPC.
ACID YELLOW 54	AC, TRC.
ACID YELLOW 59	VPC.
ACID YELLOW 63	AC.
ACID YELLOW 65	ATL(E), TRC.
ACID YELLOW 73	ACS, SDH.
ACID YELLOW 76	TRC.
ACID YELLOW 79	VPC.
ACID YELLOW 99	GAF, TRC.
ACID YELLOW 114	TRC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C I D D Y E S--CONTINUED	
@ACID YELLOW DYES--CONTINUED	
ACID YELLOW 121	GAF.
ACID YELLOW 127	TRC.
ACID YELLOW 128	TRC.
ACID YELLOW 129	TRC.
ACID YELLOW 135	GAF.
@ACID YELLOW 151	AC, ALT, DUP, GAF, TRC, VPC.
@ACID YELLOW 159	ALT, GAF, TRC, VPC.
@ACID YELLOW 174	AC, DUP, TRC, VPC.
ACID YELLOW 198	DUP.
ACID YELLOW 200	DUP.
ACID YELLOW DYES, ALL OTHER	ATL(E), BAS, GAF, ICI, TRC, VPC.
@ACID ORANGE DYES:	
ACID ORANGE 1	AC.
ACID ORANGE 5	ACY.
@ACID ORANGE 7	AC, ACS, ACY, BDO, GAF, PDC, TRC, VPC.
@ACID ORANGE 8	AC, ACY, ATL(E), DUP, GAF, PDC, TRC, VPC.
@ACID ORANGE 10	AC, ACY, GAF, PDC, TRC.
ACID ORANGE 12	ATL(E), PSC.
@ACID ORANGE 24	ACS, ACY, GAF, TRC.
ACID ORANGE 45	ACS.
ACID ORANGE 51	TRC.
@ACID ORANGE 60	AC, ALT, ATL(E), DUP, GAF, TRC, VPC.
ACID ORANGE 62	TRC.
ACID ORANGE 63	ATL(E), TRC, VPC.
ACID ORANGE 64	ACY, DUP.
ACID ORANGE 72	ACY.
ACID ORANGE 74	GAF, TRC.
ACID ORANGE 76	TRC.
ACID ORANGE 86	TRC.
ACID ORANGE 87	ALT.
@ACID ORANGE 116	AC, ALT, GAF, TRC.
ACID ORANGE 128	DUP.
ACID ORANGE 132	DUP.
ACID ORANGE 152	DUP.
ACID ORANGE DYES, ALL OTHER	ALT, ATL(E), GAF, PDC, TRC, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C I D D Y E S--CONTINUED	
@ACID RED DYES:	
@ACID RED 1	ACS, ACY, ATL(E), BDO, DUP, GAF, HSH, TRC, VPC.
@ACID RED 4	AC, ATL(E), BDO, CMG, GAF, TRC.
ACID RED 14	GAF, PDC.
ACID RED 17	ATL(E).
ACID RED 18	GAF, TRC.
ACID RED 26	ACY, VPC.
ACID RED 35	GAF.
@ACID RED 37	AC, ATL(E), TRC.
ACID RED 51	BDO.
ACID RED 57	ATL(E), ICI, TRC.
ACID RED 66	AC, ATL(E).
@ACID RED 73	ACY, ATL(E), GAF, HSH, PSC, TRC, VPC.
ACID RED 80	AC, BDO.
@ACID RED 85	ACS, FAB, GAF.
ACID RED 87	SDH.
ACID RED 88	ACY, ATL(E), GAF, TRC.
ACID RED 89	BDO, GAF.
ACID RED 97	ATL(E), GAF.
ACID RED 99	AC, ATL(E), FAB.
ACID RED 111	VPC.
@ACID RED 114	ALT, ATL(E), DUP, GAF, TRC, VPC.
ACID RED 115	ATL(E).
ACID RED 119	ALT, ATL(E).
@ACID RED 137	ATL(E), DUP, GAF, TRC.
ACID RED 138	ALT.
@ACID RED 151	AC, ACY, ATL(E), DUP, HSH, ICI, TRC, VPC.
ACID RED 167	ATL(E), TRC.
@ACID RED 182	AC, ALT, ATL(E), DUP, VPC.
ACID RED 183	CMG.
@ACID RED 186	AC, ACY, CMG.
ACID RED 194	CMG, TRC.
ACID RED 213	TRC.
@ACID RED 266	ALT, DUP, ICI, TRC, VPC.
ACID RED 299	AC, ALT.
ACID RED 309	TRC.
@ACID RED 337	ALT, DUP, TRC, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C I D D Y E S--CONTINUED	
@ ACID RED DYES--CONTINUED	
ACID RED 350	GAF.
ACID RED 364	DUP.
ACID RED 384	DUP.
ACID RED 388	DUP.
ACID RED DYES, ALL OTHER	ALT, ATL(E), DUP, GAF, TRC, VPC.
@ACID VIOLET DYES:	
ACID VIOLET 1	BDO.
ACID VIOLET 3	ACY, TRC.
@ACID VIOLET 7	ATL(E), BDO, GAF.
ACID VIOLET 12	BDO, CMG.
ACID VIOLET 17	GAF, SDH.
ACID VIOLET 34	ATL(E).
ACID VIOLET 41	ATL(E).
ACID VIOLET 43	HSH.
ACID VIOLET 49	ACS, ACY, SDH, TRC.
ACID VIOLET DYES, ALL OTHER	SDH.
@ACID BLUE DYES:	
ACID BLUE 7	SDH.
@ACID BLUE 9	ACS, GAF, SDH.
ACID BLUE 15	GAF.
ACID BLUE 23	TRC.
@ACID BLUE 25	ATL(E), DUP, GAF, HSH, ICI, TRC, VPC.
@ACID BLUE 27	ATL(E), BDO, GAF, VPC.
ACID BLUE 29	PDC.
@ACID BLUE 40	ALT, ATL(E), CMG, DUP, GAF, ICI, TRC, VPC.
ACID BLUE 41	ATL(E), BDO, GAF.
ACID BLUE 43	TRC.
ACID BLUE 45	ATL(E), CMG, TRC.
ACID BLUE 62	ALT, BDO.
ACID BLUE 74	DUP.
ACID BLUE 78	ATL(E), TRC.
ACID BLUE 80	TRC.
ACID BLUE 92	ATL(E), FAB.
ACID BLUE 93	HSC.
ACID BLUE 104	GAF.
@ACID BLUE 113	AC, ALT, ATL(E), GAF, TRC, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C I D D Y E S--CONTINUED	
@ACID BLUE DYES--CONTINUED	
ACID BLUE 118	AC, ATL(E).
ACID BLUE 120	ATL(E).
ACID BLUE 122	DUP.
ACID BLUE 145	ACS.
ACID BLUE 158, 158:1, AND 158:2	AC, BDO, TRC, VPC.
ACID BLUE 203	VPC.
ACID BLUE 230	DUP.
ACID BLUE 231	ACY, TRC.
ACID BLUE 298	DUP.
ACID BLUE DYES, ALL OTHER	AC, ALT, ATL(E), CMG, GAF, HST, TRC, VPC.
@ACID GREEN DYES:	
ACID GREEN 1	ACY.
ACID GREEN 3	ACS, GAF, TRC.
ACID GREEN 5	WJ.
ACID GREEN 16	TRC.
ACID GREEN 20	BDO, GAF, TRC.
ACID GREEN 25	ACS, ATL(E), HSH.
ACID GREEN 35	TRC.
ACID GREEN 70	TRC.
ACID GREEN 84	VPC.
ACID GREEN DYES, ALL OTHER	ALT.
@ACID BROWN DYES:	
@ACID BROWN 14	AC, ACY, FAB, GAF, TRC.
ACID BROWN 19	TRC.
ACID BROWN 28	TRC.
ACID BROWN 31	GAF.
ACID BROWN 45	TRC.
ACID BROWN 96	ACY.
ACID BROWN 97	ACY.
ACID BROWN 98	ACY, TRC.
ACID BROWN 152	GAF.
ACID BROWN 158	GAF.
ACID BROWN 223	VPC.
ACID BROWN 354	ACY.
ACID BROWN DYES, ALL OTHER	ALT, BAS, GAF.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C I D D Y E S--CONTINUED	
@ACID BLACK DYES:	
@ACID BLACK 1	AC, ACS, ACY, ATL(E), FAB, GAF, PDC, TRC.
ACID BLACK 2	ACY.
ACID BLACK 24	AC.
ACID BLACK 26, 26:1, 26:2, 26:3, AND 26:4	ATL(E).
ACID BLACK 29	GAF.
@ACID BLACK 52	AC, ALT, ATL(E), FAB, GAF, TRC.
ACID BLACK 58	TRC.
ACID BLACK 60	BDO, TRC.
ACID BLACK 92	ACY.
@ACID BLACK 107	ALT, GAF, TRC, VPC.
ACID BLACK 108	GAF.
ACID BLACK 140	CMG.
ACID BLACK DYES, ALL OTHER	AC, ALT, ATL(E), HSH, VPC.
A Z O I C D Y E S A N D C O M P O N E N T S	
AZOIC COMPOSITIONS:	
AZOIC YELLOW COMPOSITIONS:	
AZOIC YELLOW 2	ALL, BUC.
AZOIC YELLOW 3	ATL(E).
AZOIC ORANGE COMPOSITIONS:	
AZOIC ORANGE 3	ALL, BUC.
AZOIC ORANGE 10	BUC.
AZOIC RED COMPOSITIONS:	
AZOIC RED 1	ALL, BUC, ROC.
AZOIC RED 2	BUC.
AZOIC RED 6	ALL, BUC, ROC, SDH.
AZOIC RED COMPOSITIONS, ALL OTHER	ALL.
AZOIC VIOLET COMPOSITIONS:	
AZOIC VIOLET 1	BDO, BUC.
AZOIC VIOLET COMPOSITIONS, ALL OTHER	ALL.
AZOIC BLUE COMPOSITIONS:	
AZOIC BLUE 3	ALL, BUC, GAF, HST, ROC, SDH.
AZOIC BLUE COMPOSITIONS, ALL OTHER	ALL, BUC, GAF.
AZOIC GREEN COMPOSITIONS:	
AZOIC GREEN COMPOSITIONS, ALL OTHER	ALL, BUC.
AZOIC BROWN COMPOSITIONS:	
AZOIC BROWN 9	ALL, BUC, GAF, ROC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A Z O I C D Y E S A N D C O M P O N E N T S--CONTINUED	
AZOIC COMPOSITIONS:	
AZOIC BROWN COMPOSITIONS--CONTINUED	
AZOIC BROWN 10	BUC.
AZOIC BLACK COMPOSITIONS:	
AZOIC BLACK 4	BUC.
AZOIC BLACK 15	GAF.
AZOIC BLACK COMPOSITIONS, ALL OTHER	ALL.
@AZOIC DIAZO COMPONENTS, BASES:	
AZOIC DIAZO COMPONENT 5, BASE	GAF.
AZOIC DIAZO COMPONENT 12, BASE	BUC, PFZ, SDH.
AZOIC DIAZO COMPONENT 13, BASE	BUC.
AZOIC DIAZO COMPONENT 32, BASE	ALL.
AZOIC DIAZO COMPONENTS, BASE, ALL OTHER	ALL.
@AZOIC DIAZO COMPONENTS, SALTS;	
AZOIC DIAZO COMPONENT 1, SALT	ALL, BUC.
AZOIC DIAZO COMPONENT 2, SALT	BUC.
AZOIC DIAZO COMPONENT 3, SALT	AC, ALL, BUC.
@AZOIC DIAZO COMPONENT 5, SALT	AC, ALL, BUC, SDH.
@AZOIC DIAZO COMPONENT 6, SALT	ALL, BUC, GAF.
AZOIC DIAZO COMPONENT 8, SALT	ALL, BUC.
@AZOIC DIAZO COMPONENT 9, SALT	AC, ALL, BUC, SDH.
AZOIC DIAZO COMPONENT 10, SALT	ALL, BUC.
AZOIC DIAZO COMPONENT 11, SALT	ALL.
AZOIC DIAZO COMPONENT 12, SALT	ALL, BUC.
@AZOIC DIAZO COMPONENT 13, SALT	AC, ALL, BUC, GAF.
AZOIC DIAZO COMPONENT 14, SALT	AC, ALL, BUC.
AZOIC DIAZO COMPONENT 32, SALT	ALL.
AZOIC DIAZO COMPONENT 34, SALT	ALL.
AZOIC DIAZO COMPONENT 41, SALT	ALL.
AZOIC DIAZO COMPONENT 44, SALT	ALL, BUC.
AZOIC DIAZO COMPONENT 49, SALT	ALL, BUC.
AZOIC DIAZO COMPONENT 121, SALT	GAF.
AZOIC COUPLING COMPONENTS:	
AZOIC COUPLING COMPONENT 2	ATL(E), BUC, PFZ.
AZOIC COUPLING COMPONENT 3	BUC, PFZ.
AZOIC COUPLING COMPONENT 7	BUC, PFZ, SDH.
AZOIC COUPLING COMPONENT 8	BUC, PFZ.
AZOIC COUPLING COMPONENT 11	BUC, PFZ.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A Z O I C D Y E S A N D C O M P O N E N T S--Continued	
AZOIC COUPLING COMPONENTS--CONTINUED	
AZOIC COUPLING COMPONENT 12	PFZ.
AZOIC COUPLING COMPONENT 14	BUC, PFZ.
AZOIC COUPLING COMPONENT 15	BUC, GAF.
AZOIC COUPLING COMPONENT 17	BUC, PFZ.
AZOIC COUPLING COMPONENT 18	BUC, GAF, PFZ.
AZOIC COUPLING COMPONENT 19	PFZ.
AZOIC COUPLING COMPONENT 20	BUC, PFZ.
AZOIC COUPLING COMPONENT 21	BUC, PFZ.
AZOIC COUPLING COMPONENT 29	BUC, PFZ.
AZOIC COUPLING COMPONENT 34	BUC, PFZ.
AZOIC COUPLING COMPONENT 35	PFZ.
AZOIC COUPLING COMPONENT 43	ALL, ATL(E), BUC, GAF.
AZOIC COUPLING COMPONENTS, ALL OTHER	ATL(E).
B A S I C D Y E S	
@BASIC YELLOW DYES:	
BASIC YELLOW 1	DUP.
BASIC YELLOW 2	ACY.
@BASIC YELLOW 11	ARL(E), DUP, GAF, TRC, VPC.
@BASIC YELLOW 13	ATL(E), DUP, GAF, VPC.
BASIC YELLOW 15	DUP.
BASIC YELLOW 21	ALT, VPC.
BASIS YELLOW 24	BAS.
BASIC YELLOW 25	BAS.
BASIC YELLOW 28	GAF, VPC.
BASIC YELLOW 29	DUP, GAF, VPC.
BASIC YELLOW 31	DUP.
BASIC YELLOW 41	ACY.
BASIC YELLOW 52	DUP.
BASIC YELLOW 53	DUP.
BASIC YELLOW 58	DUP.
BASIC YELLOW 79	DUP.
BASIC YELLOW 83	DUP.
BASIC YELLOW DYES, ALL OTHER	ACY, ATL(E), BAS, DUP, EKT, GAF, SDH, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
B A S I C D Y E S--Continued	
@BASIC ORANGE DYES:	
BASIC ORANGE 1	ACS, ACY, GAF, PSC, TRC.
@BASIC ORANGE 2	ACS, DUP, GAF, PSC, TRC.
@BASIC ORANGE 21	ALT, ATL(E), DUP, GAF, TRC, VPC.
BASIC ORANGE 24	DUP.
BASIC ORANGE 25	DUP.
BASIC ORANGE 26	DUP.
BASIC ORANGE 28	VPC.
BASIC ORANGE 31	ACY.
BASIC ORANGE 39	DUP.
BASIC ORANGE DYES, ALL OTHER	ALT, BAS, DUP.
@BASIC RED DYES:	
BASIC RED 1	BAS, DUP.
BASIC RED 2	DUP.
BASIC RED 12	ACY, DUP, VPC.
BASIC RED 13	GAF.
@BASIC RED 14	ACY, ATL(E), DUP, GAF, VPC.
BASIC RED 15	ATL(E), DUP, GAF.
BASIC RED 17	DUP.
@BASIC RED 18	ATL(E), DUP, GAF, VPC.
BASIC RED 19	DUP.
BASIC RED 22	ALT, TRC.
BASIC RED 29	BAS.
BASIC RED 30	ACY.
@BASIC RED 49	DUP, GAF, TRC, VPC.
BASIC RED 73	DUP.
BASIC RED DYES, ALL OTHER	ATL(E), BAS, EKT, SDH, VPC.
@BASIC VIOLET DYES:	
@BASIC VIOLET 1	ACS, ACY, DSC.
BASIC VIOLET 2	DSC.
BASIC VIOLET 3	DSC, DUP.
BASIC VIOLET 4	DUP.
BASIC VIOLET 7	ATL(E), GAF.
BASIC VIOLET 10	ACY, ASC, DUP, GAF.
BASIC VIOLET 15	DUP.
@BASIC VIOLET 16	ATL(E), DUP, GAF, TRC, VPC.
BASIC VIOLET 18	ACY.
BASIC VIOLET 24	DUP.
BASIC VIOLET DYES, ALL OTHER	DUP, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
B A S I C D Y E S--CONTINUED	
@BASIC BLUE DYES:	
BASIC BLUE 1	DSC, GAF, SDH, UPC.
BASIC BLUE 2	DSC.
BASIC BLUE 3	DUP, GAF, HST.
BASIC BLUE 5	DSC, SDH.
BASIC BLUE 6	ACY.
@BASIC BLUE 7	DSC, DUP, SDH.
BASIC BLUE 9	ACY, SDH.
BASIC BLUE 11	DSC, SDH.
BASIC BLUE 21	DUP.
BASIC BLUE 22	DUP.
BASIC BLUE 26	DSC, DUP, SDH.
BASIC BLUE 35	DUP.
BASIC BLUE 41	BAS, TRC.
BASIC BLUE 45	VPC.
BASIC BLUE 54	BAS.
BASIC BLUE 60	ACY, GAF.
BASIC BLUE 69	VPC.
BASIC BLUE 75	EKT.
BASIC BLUE 77	ACY, DUP.
BASIC BLUE 87	DUP.
BASIC BLUE 94	DUP.
BASIC BLUE DYES ALL OTHER	ACS, ATL(E), BAS, DUP, EKT, SDH, VPC.
@BASIC GREEN DYES:	
BASIC GREEN 1	DSC.
BASIC GREEN 4	ACS, ACY, DSC.
BASIC BROWN DYES:	
BASIC BROWN 1	ACY, DUP, GAF, PSC, TRC.
BASIC BROWN 2	GAF.
BASIC BROWN 4	ACS, ACY, GAF, PSC, TRC.
BASIC BLACK DYES:	
BASIC BLACK 9	VPC.
BASIC BLACK DYES, ALL OTHER	ALT, BAS, DSC, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DIRECT DYES	
@DIRECT YELLOW DYES:	
@DIRECT YELLOW 4	ACY, ATL(E), DUP, GAF, TRC, VPC.
DIRECT YELLOW 5	ACY, GAF.
@DIRECT YELLOW 6	ACS, ACY, DUP, GAF, TRC.
DIRECT YELLOW 7	ATL(E).
DIRECT YELLOW 8	ATL(E).
@DIRECT YELLOW 11	AC, ACS, ACY, DUP, GAF, SDH, TRC.
@DIRECT YELLOW 12	ACY, ATL(E), DUP, GAF, TRC.
DIRECT YELLOW 26	ATL(E).
@DIRECT YELLOW 28	ATL(E), DUP, GAF, TRC.
DIRECT YELLOW 29	ATL(E), GAF.
DIRECT YELLOW 34	ALT, TRC.
DIRECT YELLOW 39	TRC.
DIRECT YELLOW 41	ATL(E).
@DIRECT YELLOW 44	AC, ATL(E), DUP, GAF, HSH, TRC.
@DIRECT YELLOW 50	AC, ATL(E), DUP, FAB, GAF, HSH, TRC, VPC.
DIRECT YELLOW 59	ATL(E).
DIRECT YELLOW 81	ATL(E).
@DIRECT YELLOW 84	ATL(E), GAF, TRC, VPC.
@DIRECT YELLOW 105	AC, ALT, GAF, TRC.
@DIRECT YELLOW 106	AC, ALT, GAF, HSH, TRC.
DIRECT YELLOW 107	ATL(E), GAF, TRC.
DIRECT YELLOW 114	ACY.
DIRECT YELLOW 117	TRC.
DIRECT YELLOW 118	TRC.
DIRECT YELLOW 119	DUP.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I R E C T D Y E S--CONTINUED	
@DIRECT YELLOW DYES--CONTINUED	
DIRECT YELLOW 120	AC.
DIRECT YELLOW 127	DUP, TRC.
DIRECT YELLOW 131	DUP.
DIRECT YELLOW 137	DUP.
DIRECT YELLOW 139	DUP.
DIRECT YELLOW 147	DUP.
DIRECT YELLOW DYES, ALL OTHER	AC, ACY, ALT, ATL(E), FAB, GAF, TRC, VPC.
@DIRECT ORANGE DYES:	
DIRECT ORANGE 6	AC.
@DIRECT ORANGE 8	ACS, FAB, GAF.
@DIRECT ORANGE 15	AC, ACY, DUP, GAF, TRC.
DIRECT ORANGE 26	ATL(E), GAF, TRC.
DIRECT ORANGE 29	AC, ATL(E), TRC.
@DIRECT ORANGE 34	ATL(E), DUP, GAF, HSH.
DIRECT ORANGE 37	ATL(E), GAF.
@DIRECT ORANGE 39	AC, ACY, ALT, GAF.
DIRECT ORANGE 59	DUP.
DIRECT ORANGE 61	TRC.
DIRECT ORANGE 67	VPC.
@DIRECT ORANGE 72	AC, ATL(E), FAB, HSH, TRC, VPC.
@DIRECT ORANGE 73	DUP, TRC, VPC.
DIRECT ORANGE 74	DUP.
DIRECT ORANGE 78	VPC.
DIRECT ORANGE 81	DUP, GAF, VPC.
DIRECT ORANGE 88	DUP.
@DIRECT ORANGE 102	ACY, ATL(E), DUP, GAF.
DIRECT ORANGE DYES, ALL OTHER	ALT, ATL(E), TRC.
@DIRECT RED DYES:	
@DIRECT RED 1	ACS, FAB, GAF.
@DIRECT RED 2	AC, ATL(E), FAB, TRC.
DIRECT RED 4	ATL(E), TRC.
DIRECT RED 7	ATL(E).
DIRECT RED 13	ACS.
DIRECT RED 16	ATL(E), TRC.
@DIRECT RED 23	AC, ACY, ATL(E), DUP, GAF, HSH, TRC, VPC.
@DIRECT RED 24	AC, ATL(E), HSH, TRC, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I R E C T D Y E S--CONTINUED	
@DIRECT RED DYES--CONTINUED	
@DIRECT RED 26	AC, ATL(E), GAF, TRC, VPC.
DIRECT RED 28	ACS, FAB.
DIRECT RED 31	ATL(E), GAF.
DIRECT RED 37	ACS, GAF.
@DIRECT RED 39	ATL(E), GAF, TRC.
DIRECT RED 62	TRC.
@DIRECT RED 72	ATL(E), DUP, GAF, TRC.
DIRECT RED 73	ATL(E).
DIRECT RED 75	ATL(E).
DIRECT RED 76	GAF.
DIRECT RED 79	ATL(E), TRC.
@DIRECT RED 80	AC, ALT, ATL(E), HSH, SDH, TRC, VPC.
@DIRECT RED 81	AC, ACY, CMG, DUP, GAF, HSH, SDH, TRC, VPC.
@DIRECT RED 83	AC, ALT, ATL(E), FAB, TRC.
DIRECT RED 111	CMG.
DIRECT RED 117	DUP.
DIRECT RED 122	TRC.
DIRECT RED 123	GAF.
DIRECT RED 127, 127:1, AND 127:2	ATL(E).
DIRECT RED 139	ATL(E).
DIRECT RED 149	ATL(E), CMG.
DIRECT RED 152	CMG.
DIRECT RED 153	ATL(E).
DIRECT RED 209	TRC, VPC.
DIRECT RED 212	VPC.
DIRECT RED 236	DUP.
DIRECT RED 238	DUP.
DIRECT RED DYES, ALL OTHER	AC, ALT, ATL(E), GAF, HSH, SDH, TRC.
@DIRECT VIOLET DYES:	
DIRECT VIOLET 9	DUP, GAF, TRC.
DIRECT VIOLET 51	ATL(E).
DIRECT VIOLET 66	DUP, TRC.
DIRECT VIOLET 67	DUP.
DIRECT VIOLET DYES, ALL OTHER	ATL(E).
@DIRECT BLUE DYES:	
@DIRECT BLUE 1	AC, ACS, ACY, ATL(E), CMG, DUP, GAF, HSH, SDH, TRC,

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DIRECT DYES--CONTINUED	
@DIRECT BLUE DYES--CONTINUED	VPC.
@DIRECT BLUE 2	ACS, FAB, GAF.
DIRECT BLUE 6	ACS, FAB, GAF.
DIRECT BLUE 8	ATL(E), GAF.
DIRECT BLUE 14	TRC.
DIRECT BLUE 15	AC, ATL(E), DUP, GAF, VPC.
DIRECT BLUE 22	ATL(E).
DIRECT BLUE 25	ATL(E), TRC.
DIRECT BLUE 71	ATL(E).
DIRECT BLUE 75	ATL(E), TRC.
@DIRECT BLUE 76	AC, ALT, ATL(E), GAF.
DIRECT BLUE 78	CMG.
@DIRECT BLUE 80	AC, ALT, ATL(E), DUP, FAB, GAF, HSH, TRC.
DIRECT BLUE 81	ATL(E).
@DIRECT BLUE 86	AC, ALT, ATL(E), DUP, FAB, TRC, VPC.
DIRECT BLUE 87	ATL(E).
DIRECT BLUE 91	TRC.
@DIRECT BLUE 98	ALT, GAF, TRC.
DIRECT BLUE 100	ALT, FAB.
DIRECT BLUE 104	DUP.
DIRECT BLUE 120, 120:1, 120:2, AND 120:3	AC, ATL(E), TRC.
DIRECT BLUE 126	ATL(E), HSH.
DIRECT BLUE 143	DUP.
DIRECT BLUE 151	ATL(E).
DIRECT BLUE 160	TRC, VPC.
DIRECT BLUE 189	TRC.
DIRECT BLUE 191	ALT, GAF.
DIRECT BLUE 199	DUP.
@DIRECT BLUE 218	AC, ATL(E), DUP, FAB, GAF, TRC, VPC.
DIRECT BLUE 260	DUP.
DIRECT BLUE 263	DUP.
DIRECT BLUE 279	DUP.
DIRECT BLUE DYES, ALL OTHER	AC, ALT, ATL(E), HSH.
@DIRECT GREEN DYES:	
@DIRECT GREEN 1	ACS, FAB, GAF, TRC.
DIRECT GREEN 6	ACS, FAB, GAF.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I R E C T D Y E S--CONTINUED	
@DIRECT GREEN DYES--CONTINUED	
DIRECT GREEN 26	TRC.
DIRECT GREEN 27	TRC.
DIRECT GREEN 28	TRC.
DIRECT GREEN 45	VPC.
DIRECT GREEN 47	DUP, GAF.
DIRECT GREEN 51	TRC.
DIRECT GREEN 69	TRC.
DIRECT GREEN DYES, ALL OTHER	DUP.
@DIRECT BROWN DYES:	
DIRECT BROWN 1, 1:1, AND 1:2	GAF.
@DIRECT BROWN 2	ACS, FAB, GAF.
DIRECT BROWN 6	FAB.
@DIRECT BROWN 31	ACS, ATL(E), FAB, GAF.
DIRECT BROWN 44	FAB, GAF.
DIRECT BROWN 74	ACS, FAB.
@DIRECT BROWN 95	ACS, ATL(E), FAB, GAF.
DIRECT BROWN 111	DUP, GAF.
DIRECT BROWN 112	ATL(E).
DIRECT BROWN 154	ACS, FAB.
DIRECT BROWN DYES, ALL OTHER	AC, ALT, ATL(E), DUP, VPC.
@DIRECT BLACK DYES:	
DIRECT BLACK 4	FAB, GAF.
DIRECT BLACK 19	ATL(E), TRC.
@DIRECT BLACK 22	AC, ALT, ATL(E), TRC, VPC.
@DIRECT BLACK 38	ACS, ACY, FAB, GAF, TRC.
DIRECT BLACK 78	AC.
DIRECT BLACK 80	AC, ATL(E), PAB.
DIRECT BLACK DYES, ALL OTHER	AC, ACS, FAB.
D I S P E R S E D Y E S	
@DISPERSE YELLOW DYES:	
DISPERSE YELLOW 1	AC, GAF.
@DISPERSE YELLOW 3	ATL(E), DUP, GAF, HSH, TRC, VPC.
DISPERSE YELLOW 5	GAF, ICC.
DISPERSE YELLOW 8	ATL(E).
@DISPERSE YELLOW 23	AC, DUP, EKT, GAF, HSH, TRC.
@DISPERSE YELLOW 33	AC, EKT, GAF, TRC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I S P E R S E D Y E S--CONTINUED	
@DISPERSE YELLOW DYES--CONTINUED	
@DISPERSE YELLOW 34	AC, EKT, ICC.
@DISPERSE YELLOW 42	AC, BUC, DUP, EKT, GAF, ICC, SDC, TRC.
DISPERSE YELLOW 50	TRC.
@DISPERSE YELLOW 54	BAS, DUP, GAF, ICC, SDC, TRC, VPC.
DISPERSE YELLOW 64	BAS, DUP, GAF.
DISPERSE YELLOW 67	DUP, VPC.
DISPERSE YELLOW 68	HST.
DISPERSE YELLOW 77	VPC.
DISPERSE YELLOW 85	EKT, VPC.
DISPERSE YELLOW 86	AC, EKT.
DISPERSE YELLOW 87	EKT.
DISPERSE YELLOW 88	ALT, EKT.
DISPERSE YELLOW 89	EKT.
DISPERSE YELLOW 93	VPC.
DISPERSE YELLOW 95	VPC.
DISPERSE YELLOW 96	VPC.
DISPERSE YELLOW 125	SDC.
DISPERSE YELLOW 131	DUP.
DISPERSE YELLOW 136	DUP.
DISPERSE YELLOW 137	DUP.
DISPERSE YELLOW 138	DUP.
DISPERSE YELLOW DYES, ALL OTHER	AC, ATL(E), BAS, EKT, HST, ICI, MAY, SDC, VPC.
@DISPERSE ORANGE DYES:	
@DISPERSE ORANGE 3	ATL(E), GAF, HSH, TRC.
DISPERSE ORANGE 5	AC, BUC, EKT.
@DISPERSE ORANGE 17	AC, EKT, GAF, HSH, ICC.
DISPERSE ORANGE 21	TRC.
@DISPERSE ORANGE 25	ATL(E), DUP, EKT, TRC, VPC.
DISPERSE ORANGE 29	GAF, HSH, VPC.
DISPERSE ORANGE 30	ICC, TRC.
DISPERSE ORANGE 37	EKT, GAF, TRC.
DISPERSE ORANGE 41	AC, DUP.
DISPERSE ORANGE 44	DUP, TRC.
DISPERSE ORANGE 57	BUC, EKT.
DISPERSE ORANGE 58	EKT.
DISPERSE ORANGE 62	DUP.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I S P E R S E D Y E S--CONTINUED	
@DISPERSE ORANGE DYES--CONTINUED	
DISPERSE ORANGE 65	VPC.
DISPERSE ORANGE 75	DUP, HSH.
DISPERSE ORANGE 95	DUP, GAF.
DISPERSE ORANGE 98	DUP.
DISPERSE ORANGE 125	DUP.
DISPERSE ORANGE DYES, ALL OTHER	AC, ALT, ATL(E), BAS, BUC, DUP, EKT, GAF, HSH, HST, MAY, SDC, TRC, VPC.
@DISPERSE RED DYES:	
@DISPERSE RED 1	AC, ATL(E), DUP, EKT, GAF, HSH, ICC, TRC.
DISPERSE RED 4	GAF, TRC.
@DISPERSE RED 5	AC, EKT, HSH, ICC.
DISPERSE RED 7	AC.
DISPERSE RED 9	ATL(E).
DISPERSE RED 11	AC, DUP, GAF.
DISPERSE RED 13	GAF, VPC.
@DISPERSE RED 15	GAF, HSH, ICC, TRC.
@DISPERSE RED 17	AC, EKT, GAF, HSH, TRC.
DISPERSE RED 21	EKT.
DISPERSE RED 30	EKT, TRC.
DISPERSE RED 35	EKT.
DISPERSE RED 50	ALT, ICC, TRC.
DISPERSE RED 55	DUP, GAF, TRC, VPC.
DISPERSE RED 59	DUP, GAF.
@DISPERSE RED 60	AC, ALT, DUP, EKT, GAF, TRC, VPC.
@DISPERSE RED 65	AC, ALT, DUP, EKT, ICC, TRC.
DISPERSE RED 73	BAS, TRC.
DISPERSE RED 82	VPC.
@DISPERSE RED 86	EKT, HSH, TRC.
DISPERSE RED 88	EKT.
DISPERSE RED 90	VPC.
DISPERSE RED 96	ACY.
DISPERSE RED 117	EKT.
DISPERSE RED 128	DUP.
DISPERSE RED 133	VPC.
DISPERSE RED 135	DUP.
DISPERSE RED 136	AC, EKT.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I S P E R S E D Y E S--CONTINUED	
@DISPERSE RED DYES--CONTINUED	
DISPERSE RED 137	EKT.
DISPERSE RED 138	EKT.
DISPERSE RED 140	AC, DUP.
DISPERSE RED 159	VPC.
DISPERSE RED 161	DUP.
DISPERSE RED 162	DUP.
@DISPERSE RED 177	ALT, ICC, SDC, VPC.
DISPERSE RED 179	GAF, ICC.
DISPERSE RED 180	ICC.
DISPERSE RED 217	DUP.
DISPERSE RED 219	DUP.
DISPERSE RED 220	DUP.
DISPERSE RED 271	DUP.
DISPERSE RED 276	DUP.
DISPERSE RED DYES, ALL OTHER	ALT, BAS, BUC, DUP, EKT, GAF, HSH, HST, ICC, MAY, SDC, TRC, VPC.
@DISPERSE VIOLET DYES:	
@DISPERSE VIOLET 1	AC, GAF, HSH, ICC, TRC.
DISPERSE VIOLET 8	GAF.
DISPERSE VIOLET 17	DUP.
DISPERSE VIOLET 28	DUP, TRC.
DISPERSE VIOLET 26	DUP.
@DISPERSE VIOLET 27	AC, ACY, DUP, EKT, ICC.
DISPERSE VIOLET 41	EKT.
DISPERSE VIOLET 42	EKT.
DISPERSE VIOLET 44	EKT.
DISPERSE VIOLET 64	DUP.
DISPERSE VIOLET DYES, ALL OTHER	EKT, ICI, MAY, SDC, VPC.
@DISPERSE BLUE DYES:	
DISPERSE BLUE 1	GAF, ICC.
@DISPERSE BLUE 3	AC, EKT, GAF, HSH, ICC, TRC.
DISPERSE BLUE 7	AC, ICC, TRC.
DISPERSE BLUE 27	EKT.
DISPERSE BLUE 55	TRC.
DISPERSE BLUE 56	ICC, VPC.
DISPERSE BLUE 60	DUP.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I S P E R S E D Y E S--CONTINUED	
@DISPERSE BLUE DYES--CONTINUED	
DISPERSE BLUE 62	DUP, EKT.
@DISPERSE BLUE 64	AC, DUP, EKT, TRC.
DISPERSE BLUE 73	ACY, TRC.
DISPERSE BLUE 77	EKT.
@DISPERSE BLUE 79	EKT, GAF, HSH, HST, ICC, MAY, TRC.
DISPERSE BLUE 81	VPC.
DISPERSE BLUE 94	BAS.
DISPERSE BLUE 95	HST.
DISPERSE BLUE 102	EKT.
DISPERSE BLUE 109	DUP.
DISPERSE BLUE 112	EKT.
DISPERSE BLUE 118	EKT.
DISPERSE BLUE 125	ALT, TRC.
DISPERSE BLUE 132	DUP, HST.
DISPERSE BLUE 139	VPC.
DISPERSE BLUE 150	DUP.
DISPERSE BLUE 165	DUP.
DISPERSE BLUE 191	DUP.
DISPERSE BLUE 192	DUP.
DISPERSE BLUE 194	DUP.
DISPERSE BLUE 283	DUP.
DISPERSE BLUE DYES, ALL OTHER	AC, ALT, ATL(E), BAS, BUC, DUP, EKT, GAF, HSH, HST, ICC, MAY, SDC, TRC, VPC.
DISPERSE GREEN DYES:	
DISPERSE GREEN 7	DUP.
DISPERSE GREEN DYES, ALL OTHER	HSH, VPC.
DISPERSE BROWN DYES:	
DISPERSE BROWN 1	AC, ALT, ICI, SDC, TRC.
DISPERSE BROWN 2	DUP, EKT, GAF.
DISPERSE BROWN 14	DUP.
DISPERSE BROWN 15	DUP.
DISPERSE BROWN DYES, ALL OTHER	ATL(E), BAS, HSH, HST, ICC, SDC, TRC, VPC.
@DISPERSE BLACK DYES:	
DISPERSE BLACK 1	ATL(E), GAF.
DISPERSE BLACK 2	ATL(E).
DISPERSE BLACK 9	AC, EKT.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
D I S P E R S E D Y E S--CONTINUED	
@DISPERSE BLACK DYES--CONTINUED	
DISPERSE BLACK 33	AC, EKT, ICC.
DISPERSE BLACK DYES, ALL OTHER	ALT, ATL(E), BAS, HSH, ICC, SDC, VPC.
R E A C T I V E D Y E S	
@REACTIVE YELLOW DYES:	
REACTIVE YELLOW 1	ICI.
REACTIVE YELLOW 2	TRC.
REACTIVE YELLOW 3	TRC.
REACTIVE YELLOW 4	ICI.
REACTIVE YELLOW 6	TRC.
REACTIVE YELLOW 7	ICI.
REACTIVE YELLOW 15	HST.
REACTIVE YELLOW 17	HST.
REACTIVE YELLOW 18	ICI.
REACTIVE YELLOW 24	HST.
REACTIVE YELLOW 25	VPC.
REACTIVE YELLOW 37	HST.
REACTIVE YELLOW DYES, ALL OTHER	HST, ICI, VPC.
REACTIVE ORANGE DYES:	
REACTIVE ORANGE 1	FAB, ICI.
REACTIVE ORANGE 4	ICI.
REACTIVE ORANGE 12	ICI.
REACTIVE ORANGE 13	ICI.
REACTIVE ORANGE 14	ICI.
REACTIVE ORANGE 16	HST.
REACTIVE ORANGE DYES, ALL OTHER	HST, ICI, TRC.
REACTIVE RED DYES:	
REACTIVE RED 1	ICI.
REACTIVE RED 2	FAB, ICI.
REACTIVE RED 5	ICI.
REACTIVE RED 8	ICI.
REACTIVE RED 11	FAB, ICI.
REACTIVE RED 29	ICI.
REACTIVE RED 31	ICI.
REACTIVE RED 33	ICI.
REACTIVE RED 40	VPC.
REACTIVE RED 41	VPC.
REACTIVE RED 58	ICI.
REACTIVE RED DYES, ALL OTHER	HST, ICI, TRC, VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
REACTIVE DYES--CONTINUED	
REACTIVE VIOLET DYES:	
REACTIVE VIOLET 1	ICI.
REACTIVE VIOLET 4	HST.
REACTIVE VIOLET 5	HST.
REACTIVE VIOLET DYES, ALL OTHER	HST.
REACTIVE BLUE DYES:	
REACTIVE BLUE 3	ICI.
REACTIVE BLUE 4	ICI.
REACTIVE BLUE 5	ICI, TRC.
REACTIVE BLUE 7	TRC.
REACTIVE BLUE 19	HST.
REACTIVE BLUE 21	HST.
REACTIVE BLUE 29	VPC.
REACTIVE BLUE 38	HST.
REACTIVE BLUE DYES, ALL OTHER	HST, ICI.
REACTIVE GREEN DYES:	
REACTIVE GREEN DYES, ALL OTHER	HST.
REACTIVE BROWN DYES:	
REACTIVE BROWN 10	ICI.
REACTIVE BROWN DYES, ALL OTHER	HST, ICI.
REACTIVE BLACK DYES:	
REACTIVE BLACK 5	HST.
REACTIVE BLACK 9	ICI.
REACTIVE BLACK DYES, ALL OTHER	HST.
DISPERSE BLACK 33	AC, EKT, ICC.
DISPERSE BLACK DYES, ALL OTHER	ALT, ATL(E), BAS, HSH, ICC, SDC, VPC.
FLUORESCENT BRIGHTENERS	
FLUORESCENT BRIGHTENER 9	SDH.
FLUORESCENT BRIGHTENER 22	CGY.
FLUORESCENT BRIGHTENER 24	CGY, VPC.
FLUORESCENT BRIGHTENER 25	GAF.
@FLUORESCENT BRIGHTENER 28	ACY, CCW, SDH, VPC.
FLUORESCENT BRIGHTENER 46	CGY.
FLUORESCENT BRIGHTENER 49	S.
FLUORESCENT BRIGHTENER 52	S.
FLUORESCENT BRIGHTENER 54	CGY.
FLUORESCENT BRIGHTENER 59	CGY.
@FLUORESCENT BRIGHTENER 61	ACY, CCW, GAF.
FLUORESCENT BRIGHTENER 71	ACY, CGY.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
FLUORESCENT BRIGHTENERS--CONTINUED	
FLUORESCENT BRIGHTENER 102	DUP.
FLUORESCENT BRIGHTENER 109	GAF.
FLUORESCENT BRIGHTENER 125	ACY, VPC.
FLUORESCENT BRIGHTENER 126	SDH.
FLUORESCENT BRIGHTENER 128	SDH.
FLUORESCENT BRIGHTENER 130	ACY.
FLUORESCENT BRIGHTENER 134	CGY.
FLUORESCENT BRIGHTNER 159	ACY.
FLUORESCENT BRIGHTENERS, ALL OTHER	ACY, CCW, DGO, S, VPC.
FOOD, DRUG, AND COSMETIC COLORS	
@FOOD, DRUG, AND COSMETIC DYES:	
@FOOD, DRUG, AND COSMETIC BLUE 1	ACS, ALT, KON, SDH, WJ.
@FOOD, DRUG, AND COSMETIC BLUE 2	ACS, ALT, KON, SDH, WJ.
FOOD, DRUG, AND COSMETIC GREEN 3	WJ.
@FOOD, DRUG, AND COSMETIC RED 2	ALT, KON, SDH, WJ.
@FOOD, DRUG, AND COSMETIC RED 3	ALT, KON, SDH, STG, WJ.
FOOD, DRUG, AND COSMETIC RED 4	ALT, KON.
FOOD, DRUG, AND COSMETIC RED 40	ACS, ALT, KON, WJ.
@FOOD, DRUG, AND COSMETIC YELLOW 5	ACS, ALT, KON, SDH, STG, WJ.
@FOOD, DRUG, AND COSMETIC YELLOW 6	ACS, ALT, KON, SDH, STG, WJ.
FOOD, DRUG, AND COSMETIC DYES, ALL OTHER	SDH, STG.
@DRUG AND COSMETIC DYES,	
DRUG AND COSMETIC BLUE 6	KON.
DRUG AND COSMETIC GREEN 5	ACS, KON.
DRUG AND COSMETIC GREEN 6	KON.
DRUG AND COSMETIC GREEN 8	KON, SDH.
DRUG AND COSMETIC ORANGE 4	ACS, KON.
DRUG AND COSMETIC ORANGE 5	SDH, SNA, TMS.
DRUG AND COSMETIC ORANGE 17	SNA.
@DRUG AND COSMETIC RED 6	KON, SDH, SNA.
@DRUG AND COSMETIC RED 7	KON, SDH, SNA, TMS.
DRUG AND COSMETIC RED 9	KON, SDH, SNA.
DRUG AND COSMETIC RED 10	KON, SNA.
DRUG AND COSMETIC RED 11	KON, SNA.
DRUG AND COSMETIC RED 12	SDH, SNA.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
FOOD, DRUG AND COSMETIC COLORS--CONTINUED	
@DRUG AND COSMETIC DYES--CONTINUED	
DRUG AND COSMETIC RED 13	SDH, SNA.
DRUG AND COSMETIC RED 17	KON.
@DRUG AND COSMETIC RED 19	ACS, KON, MRX, SNA.
DRUG AND COSMETIC RED 21	SDH, SNA.
DRUG AND COSMETIC RED 22	SDH.
DRUG AND COSMETIC RED 27	MRX, SDH.
DRUG AND COSMETIC RED 28	SDH.
DRUG AND COSMETIC RED 30	KON, SNA.
DRUG AND COSMETIC RED 33	ACS, KON.
DRUG AND COSMETIC RED 34	KON, SNA.
DRUG AND COSMETIC RED 36	ALT, KON.
DRUG AND COSMETIC RED 37	ACS.
DRUG AND COSMETIC VIOLET 2	ACS.
DRUG AND COSMETIC YELLOW 5	CMG, KON.
DRUG AND COSMETIC YELLOW 6	CMG, KON.
DRUG AND COSMETIC YELLOW 10	KON.
DRUG AND COSMETIC YELLOW 11	ACS, KON.
DRUG AND COSMETIC DYES, ALL OTHER	SDH, SNA.
DRUG AND COSMETIC DYES, EXTERNAL:	
EXTERNAL DRUG AND COSMETIC GREEN 1	ACS.
EXTERNAL DRUG AND COSMETIC YELLOW 1	ACS, KON.
EXTERNAL DRUG AND COSMETIC YELLOW 7	KON, SDH.
EXTERNAL DRUG AND COSMETIC DYES, ALL OTHER	KON.
MORDANT DYES	
MORDANT YELLOW DYES:	
MORDANT YELLOW 1	PDC.
MORDANT YELLOW 8	PDC.
MORDANT YELLOW 16	ACY.
MORDANT YELLOW 29	GAF.
@MORDANT ORANGE DYES:	
@MORDANT ORANGE 1	ACY, PDC, TRC.
@MORDANT ORANGE 6	ATL(E), GAF, PDC, TRC.
MORDANT ORANGE 8	TRC.
MORDANT RED DYES:	
MORDANT RED 7	ACY, BDO, PDC.
MORDANT RED 9	MRX.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
M O R D A N T D Y E S--CONTINUED	
MORDANT RED DYES--CONTINUED	
MORDANT RED 11	ACY.
MORDANT RED DYES, ALL OTHER	SDH.
MORDANT BLUE DYES:	
MORDANT BLUE 1	GAF.
MORDANT BLUE 13	HSH.
@MORDANT BROWN DYES:	
MORDANT BROWN 1	PDC, TRC.
MORDANT BROWN 15	GAF.
MORDANT BROWN 18	PDC.
MORDANT BROWN 33	GAF, PDC, TRC.
MORDANT BROWN 63	TRC.
MORDANT BROWN 70	PDC.
@MORDANT BLACK:	
MORDANT BLACK 9	VPC.
@MORDANT BLACK 11	GAF, TRC, VPC.
MORDANT BLACK 13	HSH.
MORDANT BLACK 17	GAF, TRC.
MORDANT BLACK 19	PDC.
S O L V E N T D Y E S	
@SOLVENT YELLOW DYES:	
SOLVENT YELLOW 3	PSC.
SOLVENT YELLOW 13	ACY, GAF.
SOLVENT YELLOW 14	ACY, DUP, GAF, PSC, VPC.
SOLVENT YELLOW 19	GAF.
SOLVENT YELLOW 29	GAF.
SOLVENT YELLOW 30	PSC.
SOLVENT YELLOW 33	AC, ACS, ACY.
SOLVENT YELLOW 40	ACS.
SOLVENT YELLOW 42	ACS.
SOLVENT YELLOW 43	DGO.
SOLVENT YELLOW 44	DGO.
SOLVENT YELLOW 47	ACY, DUP.
SOLVENT YELLOW 56	ACY, PSC.
SOLVENT YELLOW 71	ACY.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
S O L V E N T D Y E S--CONTINUED	
@SOLVENT YELLOW--CONTINUED	
SOLVENT YELLOW 72	AC, ACY.
SOLVENT YELLOW 87	ACY.
SOLVENT YELLOW 107	MRT.
SOLVENT YELLOW DYES, ALL OTHER	AC, ATL(E), DGO, MRT.
@SOLVENT ORANGE DYES:	
SOLVENT ORANGE 3	ACY, GAF, PSC.
SOLVENT ORANGE 7	ACY, GAF, PSC.
SOLVENT ORANGE 20	ACY, GAF.
SOLVENT ORANGE 23	ACS.
SOLVENT ORANGE 24	DUP.
SOLVENT ORANGE 25	ACY, DUP.
SOLVENT ORANGE 51	ACY.
SOLVENT ORANGE DYES, ALL OTHER	AC, ACY, DUP, PSC.
@SOLVENT RED DYES:	
SOLVENT RED 1	PSC.
SOLVENT RED 8	GAF.
SOLVENT RED 22	GAF.
SOLVENT RED 23	PSC.
SOLVENT RED 24	ACY, DUP, GAF, PSC.
SOLVENT RED 26	ACY, PSC.
SOLVENT RED 27	PSC.
SOLVENT RED 33	DUP, GAF.
@SOLVENT RED 49	ACY, DSC, DUP, GAF.
SOLVENT RED 68	ACS.
SOLVENT RED 69	DUP.
SOLVENT RED 74	ACS.
SOLVENT RED 105	ACY.
SOLVENT RED 108	ACY.
SOLVENT RED 111	AC, ACY.
SOLVENT RED 115	ACY.
SOLVENT RED 126	ACY.
SOLVENT RED 164	MRT.
SOLVENT RED 166	MRT.
SOLVENT RED DYES, ALL OTHER	AC, ACY, ATL(E), MRT.
SOLVENT VIOLET DYES:	
SOLVENT VIOLET 8	ACY, DSC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
S O L V E N T D Y E S--CONTINUED	
SOLVENT VIOLET DYES--CONTINUED	
SOLVENT VIOLET 9	DSC.
SOLVENT VIOLET 13	AC, ATL(E), HSH.
SOLVENT VIOLET 14	AC.
SOLVENT VIOLET DYES, ALL OTHER	AC.
@SOLVENT BLUE DYES	
SOLVENT BLUE 3	ACY, SW(E).
SOLVENT BLUE 4	DSC, DUP, SDH.
SOLVENT BLUE 5	DSC.
SOLVENT BLUE 6	DSC.
SOLVENT BLUE 7	ACY.
SOLVENT BLUE 12	DUP.
SOLVENT BLUE 14	ACY.
SOLVENT BLUE 36	AC, DUP.
SOLVENT BLUE 37	DUP.
SOLVENT BLUE 38	ACY, ATL(E), DUP.
SOLVENT BLUE 58	ACY.
SOLVENT BLUE 59	AC, ACY.
SOLVENT BLUE 74	ACS.
SOLVENT BLUE 98	MRT.
SOLVENT BLUE 100	MRT.
SOLVENT BLUE DYES, ALL OTHER	ACY, DSC, DUP, GAF, HSC, MBT, X.
SOLVENT GREEN DYES:	
SOLVENT GREEN 1	ACY, DSC.
SOLVENT GREEN 2	GAF.
SOLVENT GREEN 3	AC, ACS, ATL(E), HSH.
SOLVENT GREEN DYES, ALL OTHER	DSC.
SOLVENT BROWN DYES:	
SOLVENT BROWN 11	GAF.
SOLVENT BROWN 12	ACY, GAF, PSC.
SOLVENT BROWN 19	DUP.
SOLVENT BROWN 20	ACY, DUP.
SOLVENT BROWN 22	PSC.
SOLVENT BROWN 38	ACY.
SOLVENT BROWN DYES, ALL OTHER	ATL(E), DSC.
SOLVENT BLACK DYES:	
SOLVENT BLACK 5	ACY, DSC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
S O L V E N T D Y E S--CONTINUED	
SOLVENT BLACK--CONTINUED	
SOLVENT BLACK 7	ACY, DSC, PSC.
SOLVENT BLACK 13	ACS.
SOLVENT BLACK 26	ACY.
SOLVENT BLACK DYES, ALL OTHER	DSC, PSC.
S U L F U R D Y E S	
SULFUR YELLOW DYES:	
LEUCO SULFUR YELLOW 1	SDC.
LEUCO SULFUR YELLOW 2	SDC.
LEUCO SULFUR YELLOW 4	SDC.
SULFUR YELLOW DYES, ALL OTHER	SDC.
SULFUR ORANGE DYES:	
SULFUR ORANGE DYES, ALL OTHER	SDC.
SULFUR RED DYES:	
SULFUR RED DYES, ALL OTHER	SDC.
SULFUR BLUE DYES:	
LEUCO SULFUR BLUE 7	ACY, SDC.
LEUCO SULFUR BLUE 8	SDC.
LEUCO SULFUR BLUE 13	ACY.
SULFUR BLUE 7	SDC.
SULFUR BLUE 8	SDC.
SULFUR GREEN DYES:	
LEUCO SULFUR GREEN 2	SDC.
LEUCO SULFUR GREEN 3	SDC.
LEUCO SULFUR GREEN 16	SDC.
SULFUR GREEN 14	SDC.
SULFUR GREEN DYES, ALL OTHER	SDC.
SULFUR BROWN DYES:	
LEUCO SULFUR BROWN 3	SDC.
LEUCO SULFUR BROWN 10	SDC.
LEUCO SULFUR BROWN 14	SDC.
LEUCO SULFUR BROWN 82	ACY.
SULFUR BROWN DYES, ALL OTHER	SDC.
SULFUR BLACK DYES:	
LEUCO SULFUR BLACK 1	ACY, SDC.
LEUCO SULFUR BLACK 2	ACY, SDC.
LEUCO SULFUR BLACK 10	ACY.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
S U L F U R D Y E S--CONTINUED	
SULFUR BLACK DYES--CONTINUED	
LEUCO SULFUR BLACK 11	SDC.
SOLUBILIZED SULFUR BLACK 2	SDC.
SULFUR BLACK 1	ACY, SDC.
SULFUR BLACK 2	SDC.
SULFUR BLACK 11	SDC.
SULFUR BLACK DYES, ALL OTHER	SDC.
V A T D Y E S	
@VAT YELLOW DYES:	
VAT YELLOW 1, 12-1/2%	ATL(E).
@VAT YELLOW 2, 8-1/2%	AC, TRC, VPC.
VAT YELLOW 4, 12-1/2%	HST, VPC.
VAT YELLOW 14 12-1/2%	TRC.
VAT YELLOW 15, 11-1/2%	ACY.
VAT YELLOW 22, 10%	DUP.
VAT YELLOW 33, 15%	TRC, VPC.
VAT YELLOW DYES, ALL OTHER	VPC.
@VAT ORANGE DYES:	
VAT ORANGE 1, 20%	ATL(E), HST, TRC, VPC.
@VAT ORANGE 2, 12%	ACY, BAS, DUP, TRC.
VAT ORANGE 3, 13-1/2%	HST.
VAT ORANGE 4, 6%	DUP.
VAT ORANGE 5, 10%	HST.
VAT ORANGE 7, 11%	HST, TRC.
VAT ORANGE 9, 12%	ACY, ATL(E), TRC.
VAT ORANGE 11, 6%	DUP.
@VAT ORANGE 15, 10%	ACY, TRC, VPC.
VAT ORANGE DYES, ALL OTHER	SDC, VPC.
@VAT RED DYES:	
VAT RED 1, 13%	ACY, ATL(E), HST.
VAT RED 12, 8-1/2%	DUP.
VAT RED 13, 11%	DUP, TRC.
VAT RED 14, 10%	HST.
VAT RED 15, 10%	HST, TRC.
VAT RED 16, 11%	DUP.
VAT RED 32, 20%	DUP.
VAT RED 41, 20%	HST.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
V A T D Y E S--CONTINUED	
@VAT VIOLET DYES:	
VAT VIOLET 1, 11%	ATL(E), DUP, TRC.
VAT VIOLET 2, 20%	ACY, HST.
VAT VIOLET 3, 15%	HST.
VAT VIOLET 9, 12%	ACY, TRC.
VAT VIOLET 13, 6-1/4%	BAS, TRC.
VAT VIOLET 21	VPC.
VAT BLUE DYES:	
VAT BLUE 1, 20%	ACS.
VAT BLUE 4, 10%	ACY.
VAT BLUE 5, 16%	ATL(E), HST.
VAT BLUE 6, 8-1/3%	ACY, BAS, TRC.
VAT BLUE 12, 6-1/2%	DUP.
VAT BLUE 16, 16%	BAS.
VAT BLUE 18, 13%	ACY, ATL(E), DUP, TRC.
VAT BLUE 20, 14%	ACY, ATL(E), TRC.
VAT BLUE 43	SDC.
VAT BLUE DYES, ALL OTHER	HST, VPC.
@VAT GREEN DYES:	
@VAT GREEN 1, 6%	ACY, ATL(E), BAS, DUP, MAY, TRC.
@VAT GREEN 3, 10%	AC, ACY, ATL(E), BAS, DUP, TRC.
VAT GREEN 8, 8-1/2%	ATL(E), DUP.
VAT GREEN 9, 12-1/2%	TRC.
VAT GREEN 32	VPC.
VAT GREEN DYES, ALL OTHER	ACY, BAS, SDC, VPC.
@VAT BROWN DYES:	
VAT BROWN 1, 11%	ACY, DUP, TRC.
VAT BROWN 3, 11%	AC, ACY, TRC.
VAT BROWN 5, 13%	ACY, HST.
VAT BROWN 11, 12%	TRC.
VAT BROWN 13, 17%	MAY, TRC.
VAT BROWN 57, 12.8%	HST, TRC.
VAT BROWN DYES, ALL OTHER	AC, SDC.
@VAT BLACK DYES:	
VAT BLACK 13, 14%	DUP.
VAT BLACK 22, 19%	ACY, TRC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

DYES	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
VAT DYES--CONTINUED	
@VAT BLACK DYES--CONTINUED	
@VAT BLACK 25, 12-1/2%	AC, ACY, DUP, TRC.
@VAT BLACK 27, 12-1/2%	ACY, BDO, DUP, TRC.
VAT BLACK DYES, ALL OTHER	ACS, ATL(E), SDC.
MISCELLANEOUS DYES, ALL OTHER	ACY, DUP, MRT, SDC, WAY.

TABLE 3.--DYES: DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of dye manufacturers that reported production or sales to the U.S. International Trade Commission for 1976 are listed below in order of their identification codes as used in table 2]

Code	Name of company	Code	Name of company
AC	American Color & Chemical Corp.	ICC	Inmont Corp.
ACS	Allied Chemical Corp., Specialty Chemicals Div.	ICI	ICI United States, Inc., Specialty Chemicals Group
ACY	American Cyanamid Co.		
ALL	Alliance Chemical, Inc.		
ALT	Crompton & Knowles Corp.	KON	H. Kohnstamm & Co., Inc.
ATL	Atlantic Chemical Corp.		
		MAY	Otto B. May, Inc.
BAS	BASF Wyandotte Corp.	MRT	Morton Norwich Products, Morton Chemical Co. Div.
BDO	Benzenoid Organics, Inc.		
BUC	Synalloy Corp., Blackman-Uhler Chemical Div.	MRX	Max Marx Color & Chemical Co.
		PCW	Pfister Chemical Works
CCW	Cincinnati Milacron Chemicals, Inc.	PDC	Berncolors-Poughkeepsie, Inc.
CGY	Ciba-Geigy Corp.	PSC	Passaic Color & Chemical Co.
CMG	Nyanza, Inc.		
		S	Sandoz, Inc.
DGO	Day-Glo Color Corp.	SDC	Martin-Marietta Corp., Sodyeco Div.
DSC	Dye Specialties, Inc.	SDH	Sterling Drug, Inc., Hilton-Davis Chemical Co. Div.
DUP	E. I. duPont de Nemours & Co., Inc.		
		SNA	Sun Chemical Corp.
		STC	American Hoechst Corp., Sou-Tex Works
EKT	Eastman Kodak Co., Tennessee Eastman Co. Div.	STG	Stange Co.
		SW	Sherwin-Williams Co.
FAB	Fabricolor Manufacturing Corp.	TMS	Sterling Drug, Inc., Thomasset Colors Div.
		TRC	Toms River Chemical Corp.
GAF	GAF Corp., Chemical Div.		
		VPC	Mobay Chemical Corp, Verona Div.
HSC	Chemetron Corp., Pigments Div.		
HSH	Harshaw Chemical Co. Div. of Kewanee Oil Co.	WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.
HST	American Hoechst Corp., Rhode Island Works	WJ	Warner-Jenkinson Manufacturing Co.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

ORGANIC PIGMENTS

David B. Beck and Edmund Cappuccilli

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

Statistics on production and sales of all organic pigments in 1976 are given in table 1.[1] For a few important pigments already reported in table 1, supplemental data on sales by commercial forms are reported in table 1A. 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 1976 was 67.7 million pounds--36.4 percent more than the 49.9 million pounds produced in 1975 and 3.0 percent less than the 69.8 million pounds produced in 1974. Total sales of organic pigments in 1976 amounted to 54.2 million pounds, valued at $261.1 million, compared with 42.4 million pounds, valued at $186.0 million, in 1975 and 58.5 million pounds, valued at $227.8 million, in 1974. In terms of quantity, sales of organic pigments in 1976 were 27.9 percent greater than in 1975 and 7.3 percent smaller than in 1974; in terms of value, sales in 1976 were 40.3 percent greater than in 1975 and 14.6 percent greater than in 1974.

Production of toners in 1976 amounted to 66.0 million pounds--38.3 percent more than the 47.7 million pounds reported in 1975. Sales in 1976 were 52.8 million pounds, valued at $256.7 million, compared with 40.8 million pounds, valued at $182.1 million, in 1975. Sales in 1976 were 29.5 percent greater than those in 1975 in terms of quantity, and 40.9 percent greater in terms of value. The individual toners listed in the report which were produced in the largest quantities in 1976 were Pigment Yellow 12, 7.8 million pounds; Pigment Blue 15, beta form, 6.5 million pounds; Pigment Red 49, barium toner, 4.6 million pounds, and Pigment Red 53, barium toner, 3.3 million pounds.

Production of lakes totaled 1.7 million pounds in 1976-11.6 percent less than the 1.9 million pounds reported for 1975. Sales of lakes in 1976 amounted to 1.4 million pounds, valued at $4.4 million, compared with sales in 1975 of 1.6 million pounds, valued at $3.9 million. Sales in 1976 were 12.6 percent less than those in 1975 in terms of quantity, and 11.7 percent greater in terms of value.

For each of 8 selected pigments, or groups of pigments, table 1A gives data on sales by commercial forms. Pigment Yellow 12, Pigment Red 53, barium toner, and Pigment Blue 15, beta form, where sold principally in the flushed form. The remaining 5 pigments, or groups of pigments, for which statistics are published were sold principally in the dry full-strength form. Statistics on sales by commercial forms could not be published for Pigment Blue 15, beta form, Pigment 49, barium toner, Pigment Red 49, calcium toner and Pigment Red 52, without revealing the operations of individual companies.

---

[1] See also table 2 which lists these products and identifies the manufacturers by codes. These codes are listed in table 3.

TABLE 1.--ORGANIC PIGMENTS: U.S. PRODUCTION AND SALES, 1976

[Listed below are all organic pigments for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published.) Table 2 lists separately all organic pigments for which data on production or sales were reported and identifies the manufacturers of each]

ORGANIC PIGMENTS	PRODUCTION	SALES		
		QUANTITY	VALUE[1]	UNIT VALUE[2]
	1,000 pounds dry basis[3]	*1,000 pounds dry basis*[3]	*1,000 dollars*	*per pound*
Grand total	67,727	54,211	261,089	$ 4.81
TONERS				
Total	66,020	52,818	256,707	4.86
Yellow toners, total	17,025	11,792	50,072	4.25
Acetoacetarylide yellows:				
Pigment Yellow 1, C.I. 11 680	506	349	1,338	3.83
Pigment Yellow 3, C.I. 11 710	239	...	...	...
Pigment Yellow 73, C.I. 11 738	701	450	1,796	3.99
Pigment Yellow 74, C.I. 11 741	1,735	1,405	6,882	4.90
Benzidine yellow:				
Pigment Yellow 12, C.I. 21 090	7,830	5,223	17,917	3.43
Pigment Yellow 13, C.I. 21 100	380	203	828	4.08
Pigment Yellow 14, C.I. 21 095	3,000	1,992	7,216	3.62
Pigment Yellow 17, C.I. 21 105	767	416	1,723	4.15
All other	1,867	1,754	12,372	7.05
Orange toners, total	1,887	1,340	8,477	6.33
Pigment Orange 5, C.I. 12 075	799	516	1,836	3.56
Pigment Orange 13, C.I. 21 110	267	171	872	5.11
Pigment Orange 16, C.I. 21 160	475	367	1,768	4.82
Pigment Orange 34, C.I. 21 115	89	...	...	...
All other	257	286	4,001	13.99
Red toners, total	25,578	21,598	90,272	4.18
Naphthol reds, total	1,318	910	6,431	7.07
Pigment Red 2, C.I. 12 310	108	52	310	5.90
Pigment Red 5, C.I. 12 490	63	34	280	8.21
Pigment Red 9, C.I. 12 460	41	...	...	...
Pigment Red 17, C.I. 12 390	95	34	232	6.82
Pigment Red 22, C.I. 12 315	89	79	530	6.68
Pigment Red 23, C.I. 12 355	268	240	1,769	7.36
All other naphthol reds	654	471	3,310	7.03
Pigment Red 3 C.I. 12 120	2,168	1,635	5,672	3.47
Pigment Red 4, C.I. 12 085	188	195	610	3.12
Pigment Red 38, C.I. 21 120	141	...	...	...
Pigment Red 48, C.I. 15 865	91	...	...	...
Pigment Red 48, C.I. 15 865, barium toner	539	474	1,966	4.15
Pigment Red 48, C.I. 15 865, calcium toner	1,928	1,647	7,062	4.29
Pigment Red 48, C.I. 15 865, strontium toner	...	8	24	2.92
Pigment Red 48, C.I. 15 865, manganese toner	315	181	792	4.37
Pigment Red 49, C.I. 15 630, barium toner	4,648	4,406	10,230	2.32
Pigment Red 49, C.I. 15 630, calcium toner	1,460	...	...	...
Pigment Red 52, C.I. 15 860, calcium toner	1,514	...	...	...
Pigment Red 52, C.I. 15 860, manganese toner	699	554	1,709	3.08
Pigment Red 53, C.I. 15 585, barium toner	3,319	2,633	7,228	2.75
Pigment Red 57, C.I. 15 850, calcium toner	2,513	1,938	8,230	4.25
Pigment Red 63, C.I. 15 880	37	37	149	4.04
Pigment Red 81, C.I. 45 160, PMA	521	502	4,347	8.66
Pigment Red 81, C.I. 45 160, PTA	59	58	663	11.34
All other	4,120	6,420	35,159	5.48
Violet toners, total	3,050	2,416	28,642	11.86
Pigment Violet 1, C.I. 45 170, PMA	62	70	638	9.08
Pigment Violet 1, C.I. 45 170, PTA	242	74	783	10.58
Pigment Violet 3, C.I. 42 535, fugituve	352	299	1,043	3.49
Pigment Violet 3, C.I. 42 535, PMA	514	396	2,023	5.11

See footnotes at end of table.

TABLE 1.--ORGANIC PIGMENTS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

ORGANIC PIGMENTS	PRODUCTION	SALES QUANTITY	SALES VALUE[1]	UNIT VALUE[2]
TONERS--Continued	*1,000 pounds dry basis*[3]	*1,000 pounds dry basis*[3]	*1,000 dollars*	*per pound*
Violet toners, total--continued				
Pigment Violet 3, C.I. 42 535, PTA	43	34	312	$ 9.25
Pigment Violet 23, C.I. 51 319	292	232	4,504	19.45
All other	1,545	1,311	19,339	14.75
Blue toners, total	14,219	12,074	56,678	4.69
Pigment Blue 1, C.I. 42 595, PMA	84	97	810	8.33
Pigment Blue 15, C.I. 74 160 alpha form	3,967	3,323	18,159	5.46
Pigment Blue 15:3, C.I. 74 160, beta form	6,479	5,191	24,984	4.81
Pigment Blue 15:4, C.I. 74 160, beta form	163	...	...	...
All other	3,526	3,463	12,725	3.67
Green toners, total	3,801	3,303	21,732	6.58
Pigment Green 2, C.I. 42 040 and 49 005, PMA	17	23	208	9.12
Pigment Green 2, C.I. 42 040 and 49 005, PTA	12	9	117	12.52
Pigment Green 7, C.I. 74 260	3,260	2,783	17,712	6.36
Pigment Green 36, C.I. 74 265	226	250	1,788	7.14
All other	286	238	1,907	8.01
Brown and black toners, total	460	295	834	2.83
Pigment Brown 5, C.I. 15 800	...	29	127	4.38
All other	460	266	707	2.66
LAKES				
Total	1,707	1,393	4,382	3.15
Red lakes:				
Pigment Red 60, C.I. 16 105	321	312	1,188	3.81
Pigment Red 83, C.I. 58 000	59	49	298	6.05
Violet lake: Pigment Violet 5, C.I. 58 055	104	91	437	4.82
Blue lakes	678	750	2,058	2.75
All other lakes	545	191	401	2.10

[1] The value of sales from toners are reported on a dry full-strength basis and the value of sales for lakes are reported on a dry form basis. All sales value data exclude the additional costs of processing or packaging in commercial forms other than the dry full-strength or dry form.
[2] Totals and "all other" unit values calculated from rounded figures.
[3] Quantities for toners are reported as dry full-strength toner content, excluding the weigth 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)* numbers shown in this report are the identifying numbers given in the third edition of the *Colour Index*.
The abbreviations PMA and PTA stand for phosphomolybdic and phosphotungstic (including phosphotungstomolybdic) acids, respectively.

ORGANIC PIGMENTS

TABLE 1A.--U.S. SALES OF SELECTED DRY FULL-STRENGTH COLORS, DRY EXTENDED COLORS, DRY DISPERSIONS, AQUEOUS DISPERSIONS, AND FLUSHED COLORS, 1976

[Listed below are supplemental sales data, by commercial forms, of selected pigments that have been reported in table 1]

SELECTED PIGMENTS BY COMMERCIAL FORMS	SALES[1] QUANTITY	VALUE	UNIT VALUE[2]
	1,000 pounds dry basis[3]	*1,000 dollars*	*per pound*
Pigment Yellow 12, C.I. 21 090, total	5,223	17,917	$3.43
Dry full-strength toner	1,632	5,398	3.31
Flushed color	3,529	12,311	3.49
Aqueous dispersion[4] and dry dispersions[5]	62	207	4.32
Pigment Yellow 13, C.I. 21 100; Pigment Yellow 14, C.I. 21 095; Pigment Yellow 17, C.I. 21 105; and other benzidine yellows, total	2,597	9,748	3.75
Dry full-strength toner	1,521	5,657	3.72
Aqueous dispersions[4]	726	2,698	3.72
Flushed color	337	1,336	3.97
Dry extended toner and dry dispersions[5]	13	56	4.18
Pigment Red 3, C.I. 12 120, total	1,635	5,672	3.47
Dry full-strength toner	1,015	3,497	3.44
Dry extended toner, aqueous dispersions[4], and flused color[5]	620	2,175	3.51
Pigment Red 48:2 calcium toner, C.I. 15 865, total	1,647	7,062	4.29
Dry full-strength toner	1,436	6,077	4.23
Dry extended toner, dry dispersion aqueous dispersions[4] and and flused color[5]	211	985	4.67
Pigment Red 53:1, C.I. 15 585, barium toner, total	2,633	7,228	2.75
Aqueous dispersions[4]	18	50	2.80
Flushed color	1,784	4,911	2.75
Dry dispersion and dry full-strength toner	831	2,267	2.73
Pigment Red 57;1, calcium toner, C.I. 15 850, total	1,938	8,230	4.25
Flushed color	1,507	6,423	4.26
Dry full-strength toner, dry extended toner, and aqueous dispersions [4,5]	431	1,807	4.19
Pigment Blue 15, C.I. 74 160, alpha form, total	3,323	18,159	5.46
Dry full-strength toner	1,385	8,032	5.85
Aqueous dispersions[4]	842	4,121	4.89
Dry dispersions, dry extended toner, and flushed color[5]	1,096	6,006	5.48
Pigment Green 7, C.I. 74 260, total	2,783	17,712	6.36
Dry full-strength toner	1,458	9,052	6.21
Flushed color	445	3,157	7.09
Aqueous dispersions[4]	683	4,079	5.97
Dry extended toner and dry dispersions[5]	197	1,424	7.23

[1] Sales quantities are identical in tables 1 and 1A; the sales value data in 1A generally exceed the value in table 1 because table 1A includes the additional processing and packaging costs of the various commercial forms.
[2] Calculated from whole figures.
[3] Quantity of the various commercial forms is given in terms of dry full-strength toner content.
[4] Includes presscake.
[5] Separate data on these commercial forms may not be published without revealing the operation of individual companies.

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

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AND "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

ORGANIC PIGMENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TONERS	
@YELLOW TONERS:	
@ACETOACETARYLIDE YELLOWS:	
@PIGMENT YELLOW 1	ACS, ACY, AMS, DUP, HPC, HSC, HSH, HST, KCW, KON, S, SDH, SNA.
PIGMENT YELLOW 2	KCW.
@PIGMENT YELLOW 3	ACS, BNS, HPC, HSC, HSH, HST, KCW, KON, ROM.
PIGMENT YELLOW 5	HPC.
PIGMENT YELLOW 6	HPC.
PIGMENT YELLOW 49	S.
@PIGMENT YELLOW 73	ACS, HPC, HSC, HSH, HST, KCW, SNA.
@PIGMENT YELLOW 74	ACS, DUP, HPC, HSC, HSH, HST, ICF, SDH, SNA.
PIGMENT YELLOW 75	HPC.
ACETOACETARYLIDE YELLOWS, ALL OTHERS	ACS, DUP, HPC, HSH, HST, KCW, KON.
DIARYLIDE YELLOWS:	
@PIGMENT YELLOW 12	ACS, AMS, APO, BOR, HPC, HSC, HSH, HST, ICF, ROM, SDH, SNA.
@PIGMENT YELLOW 13	AMS, BUC, HPC, HSC, HST, ICF, MRA, ROM, SDH, SNA.
@PIGMENT YELLOW 14	ACS, AMS, BNS, BOR, BUC, GAF, HPC, HSC, HSH, HST, ICF, MRA, ROM, S, SDH, SNA, X.
@PIGMENT YELLOW 17	ACS, BOR, BUC, HPC, HSC, HSH, HST, ICF, ROM, SDH, SNA.
PIGMENT YELLOW 55	HPC, ICF.
PIGMENT YELLOW 83	HSC, HST, ICF, SNA.
DIARYLIDE YELLOWS, OTHER	ICF, ROM.
YELLOW PIGMENTS, OTHER:	
(BASIC YELLOW 2), FUGITIVE	LVR, MRX.
(DIRECT YELLOW 6)	LVR.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
T O N E R S--CONTINUED	
@YELLOW TONERS--CONTINUED	
YELLOW PIGMENTS, OTHER--CONTINUED	
PIGMENT YELLOW 16	HST.
PIGMENT YELLOW 24	ACS.
PIGMENT YELLOW 97	HST.
PIGMENT YELLOW TONERS, ALL OTHER	ACS, ICF, S.
@ORANGE TONERS:	
PIGMENT ORANGE 1	ACS, KCW.
PIGMENT ORANGE 2	HPC, UHL.
@PIGMENT ORANGE 5	ACY, HPC, HSC, HSH, HST, SDH, SNA.
@PIGMENT ORANGE 13	ACS, AMS, HPC, HSC, HSH, ICF, KON, MRA, S.
PIGMENT ORANGE 15	ACS.
@PIGMENT ORANGE 16	ACS, BNS, HPC, HSH, HST, ICF, MRA, MRX, ROM, SDH, SNA.
@PIGMENT ORANGE 34	BUC, ICF, ROM, SDH.
PIGMENT ORANGE 43	ACS, HST.
PIGMENT ORANGE 48	DUP.
PIGMENT ORANGE 49	DUP.
PIGMENT ORANGE TONERS, ALL OTHER	ACS, KON, ROM.
@RED TONERS:	
@NAPHTHOL REDS:	
@PIGMENT RED 2	ACS, HPC, HSH, KCW, S.
@PIGMENT RED 5	GAF, HPC, HSH, ICF, ROM, S, SDH.
PIGMENT RED 7	HST, S.
@PIGMENT RED 9	HPC, HST, MRX.
PIGMENT RED 13	HPC, KCW.
PIGMENT RED 15	DUP, HST.
@PIGMENT RED 17	ACY, BNS, HPC, ICF, SNA, UHL.
PIGMENT RED 21	BNS.
@PIGMENT RED 22	ACY, DUP, HPC, MRX, ROM, SNA.
@PIGMENT RED 23	ACY, BUC, DUP, HPC, HSH, ROM, SDH, UHL.
PIGMENT RED 31	MRA.
PIGMENT RED 112	HPC, HST.
NAPHTHOL REDS, ALL OTHER	ICF, KCW, MRA, ROM, SDH, SNA, VPC.
RED PIGMENTS, OTHER:	
PIGMENT RED 1, DARK	HPC, HSH, KON.
PIGMENT RED 1, LIGHT	HPC, HSH, SDH.
@PIGMENT RED 3	ACY, CIK, DUP, HPC, HSC, HSH, KCW, KON, SDH, SNA, UHL.
@PIGMENT RED 4	ACY, AMS, HPC, HSC, KON, MRX, SDH, UHL.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
T O N E R S--CONTINUED	
@RED TONERS--CONTINUED	
RED PIGMENTS, OTHER--CONTINUED	
PIGMENT RED 6	DUP, HSH, KCW.
@PIGMENT RED 38	ACS, HSH, SNA.
PIGMENT RED 41	ACS.
@PIGMENT RED 48	AMS, GAF, HPC, ICP.
@PIGMENT RED 48:1, BARIUM	BOR, DUP, HPC, HSC, HSH, S, SNA.
@PIGMENT RED 48:2, CALCIUM	ACY, BOR, DUP, HPC(E), HSC, HSH, MGR, MRX, SNA.
@PIGMENT RED 48:3, STRONTIUM	HPC, HSH, S.
@PIGMENT RED 48:4, MANGANESE	ACS, DUP, HPC, HSH.
@PIGMENT RED 49:1, BARIUM	ACY, AMS, BNS, BOR, CIK, HSC, KON, MRX, SDH, SNA, UHL.
@PIGMENT RED 49:2, CALCIUM	ACY, AMS, BNS, BOR, CIK, HSC, SDH.
PIGMENT RED 49, SODIUM	BNS, SDH.
@PIGMENT RED 52:1, CALCIUM	AMS, HPC, HSC, MGR, SNA.
@PIGMENT RED 52:2, MANGANESE	HPC, HSC, HSH.
@PIGMENT RED 53:1, BARIUM	ACY, AMS, BOR, CIK, HSC, HSH, ICP, KON, MGR, MRX, SDH, SNA.
PIGMENT RED 53:2, CALCIUM	HSC.
PIGMENT RED 53, SODIUM	KON.
PIGMENT RED 54, CALCIUM	HSH, SDH.
@PIGMENT RED 57:1, CALCIUM	AMS, APO, BNS, BOR, CIK, DUP, HPC, HSC, HSH, ICP, KON, MGR, SDH, SNA, UHL.
PIGMENT RED 58	DUP, HPC.
@PIGMENT RED 63	HSC, HSH, KON, SNA.
@PIGMENT RED 81, PMA	AMS, DUP, HPC, KON, LVR, MGR, MRX, SNA, UHL.
@PIGMENT RED 81, PTA	DUP, HPC, HSC, KON, MGR, MRX, UHL.
PIGMENT RED 88	ACS, HST.
PIGMENT RED 90	AMS, BOR, ICP, SDH.
PIGMENT RED 122	ACS, HST, SNA.
PIGMENT RED 123	ACS, HSC.
PIGMENT RED 168	ACS, HST.
PIGMENT RED 179	ACS.
PIGMENT RED 181	HST.
PIGMENT RED 190	ACS, HSC.
PIGMENT RED 202	DUP.
PIGMENT RED 206	DUP.
PIGMENT RED 207	DUP.
PIGMENT RED TONERS, ALL OTHER	ACS, DUP, HSC, HST, ICP, X.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TONERS--CONTINUED	
@VIOLET TONERS:	
PIGMENT VIOLET 1, FUGITIVE	KCW, MRX, UHL.
@PIGMENT VIOLET 1, PMA	HPC, MGR, MRX, SNA, UHL.
@PIGMENT VIOLET 1, PTA	AMS, DUP, GAF, HPC, HSC, MGR, SNA, UHL.
@PIGMENT VIOLET 3, FUGITIVE	ACY, AMS, HSC, KON, MGR, UHL.
@PIGMENT VIOLET 3, PMA	DUP, HPC, HSC, KON, MGR, MRX, SDH, UHL.
@PIGMENT VIOLET 3, PTA	ACY, AMS, HPC, HSC, KON, MRX.
PIGMENT VIOLET 4, FUGITIVE	KCW.
PIGMENT VIOLET 19	ACS, DUP, SNA.
@PIGMENT VIOLET 23	ACS, HSC, HST, SDC, SNA.
PIGMENT VIOLET 31	DUP.
PIGMENT VIOLET 36	HST.
PIGMENT VIOLET 38	BUC.
PIGMENT VIOLET 42	DUP.
PIGMENT VIOLET TONERS, ALL OTHER	ACY, BUC, HPC, ICF, ROM.
BLUE TONERS:	
@PIGMENT BLUE 1, PMA	BNS, DUP, HPC, MGR, MRX, UHL.
PIGMENT BLUE 1, PTA	KON, MRX.
PIGMENT BLUE 2, PMA	KON.
PIGMENT BLUE 2, PTA	KON.
PIGMENT BLUE 9, PMA	UHL.
PIGMENT BLUE 10, PMA	SDH.
PIGMENT BLUE 14, PMA	DUP, GAF, LVR.
@PIGMENT BLUE 15, ALPHA FORM	ACS, ACY, DUP, GAF, HPC, HSC, HSH, HST, MRA, SDH, TMS.
PIGMENT BLUE 15:1, ALPHA FORM	HSC, HST, SNA.
PIGMENT BLUE 15:2, ALPHA FORM	HSC, SNA.
@PIGMENT BLUE 15:3, BETA FORM	ACY, AMS, APO, BAS, BOR, CIK. DUP, GAF, HPC, HSC, ICF, MGR, POP, ROM, SNA.
@PIGMENT BLUE 15:4, BETA FORM	HSC, ICF, SNA.
PIGMENT BLUE 19	HSC, SW(E).
PIGMENT BLUE 22	ACS, DUP.
PIGMENT BLUE 25	ICF.
PIGMENT BLUE TONERS, ALL OTHER	LVR, SDH, TNI, UHL.
GREEN TONERS:	
PIGMENT GREEN 1, PMA	DUP, MRX, UHL.
PIGMENT GREEN 1, PTA	MGR.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
T O N E R S--CONTINUED	
GREEN TONERS--CONTINUED	
@PIGMENT GREEN 2, PMA	GAF, KON, MGR, MRX, S.
@PIGMENT GREEN 2, PTA	ACY, HPC, KON, MRX, S.
PIGMENT GREEN 4, PMA	KON.
PIGMENT GREEN 4, PTA	ACY.
@PIGMENT GREEN 7	ACS, ACY, AMS, BAS, CIK, DUP, HPC, HSC, HST, POP, SDH, SNA, TMS.
PIGMENT GREEN 8	HPC, KCW.
PIGMENT GREEN 10	DUP, HPC.
@PIGMENT GREEN 36	ACS, ACY, DUP, HSC, HST, SNA.
PIGMENT GREEN TONERS, ALL OTHER	UHL.
BROWN TONERS:	
(ACID BROWN 1)	LVR.
PIGMENT BROWN 1	S.
PIGMENT BROWN 3, PMA	KCW, KON.
@PIGMENT BROWN 5	ACS, ICP, ROM.
PIGMENT BROWN TONERS, ALL OTHER	SDH.
BLACK TONERS:	
PIGMENT BLACK TONERS	DUP, GAF, HST, UHL.
L A K E S	
YELLOW LAKES:	
(ACID YELLOW 23)	KON, LVR, MRX.
(BASIC YELLOW 37)	BNS.
ORANGE LAKES:	
(ACID ORANGE 17)	KCW.
PIGMENT ORANGE 17	KCW, KON.
RED LAKES:	
(ACID RED 17)	HPC.
(ACID RED 26)	HPC, KCW.
(BASIC RED 1)	BNS.
(BASIC RED 2)	BNS.
@PIGMENT RED 60:1	HSH, KON, MRX, SDH, SNA.
@PIGMENT RED 83	HPC, HSH, KON, MRX, UHL.
VIOLET LAKES:	
(BASIC VIOLET 1)	BNS.
(BASIC VIOLET 4)	BNS.
(BASIC VIOLET 10)	BNS.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
L A K E S--CONTINUED	
VIOLET LAKES--CONTINUED	
@PIGMENT VIOLET 5:1	ACS, DUP, HPC, HSH, KON, MRX, S, UHL.
@BLUE LAKES:	
(BASIC BLUE 7)	BNS.
PIGMENT BLUE 17:1	GAF, SDH.
PIGMENT BLUE 24	BOB, KON.
BROWN LAKES:	
PIGMENT BROWN LAKES	KON.
BLACK LAKES:	
PIGMENT BLACK LAKES	KON.

TABLE 3.--Organic pigments: Directory of manufacturers, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of organic pigment manufacturers that reported production or sales to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
ACS	Allied Chemical Corp., Specialty Chemicals Div.
ACY	American Cyanamid Co.
AMS	Ridgway Color & Chemical
APO	Apollo Colors, Inc.
BAS	BASF Wyandotte Corp.
BNS	Binney and Smith, Inc.
BOR	Borden, Inc., Printing Ink Div.
BUC	Synalloy Corp., Blackman-Uhler Chemical Div.
CIK	Flint Ink Corp., Cal/Ink Div.
DUP	E. I. duPont de Nemours & Co., Inc.
GAF	GAF Corp., Chemical Div.
HPC	Hercules, Inc.
HSC	Chemetron Corp., Pigments Div.
HSH	Harshaw Chemical Co. Div. of Kewanee Oil Co.
HST	American Hoechst Corp., Rhode Island Works
ICC	Inmont Corp.
KCW	Keystone Color Works, Inc.
KON	H. Kohnstamm & Co., Inc.
LVR	C. Lever Co., Inc.
MGR	Magruder Color Co., Inc.
MRA	Bostik South, Inc.
MRX	Max Marx Color & Chemical Co.
POP	Pope Chemical Corp.
ROM	United Merchants & Manufacturers, Inc., Roma Chemical Div.
S	Sandoz, Inc., Colors & Chemicals Div.
SDC	Martin-Marietta Corp., Sodyeco Div.
SDH	Sterling Drug, Inc., Hilton-Davis Chemical Co. Div.
SNA	Sun Chemical Corp.
SW	Sherwin-Williams Co.
TMS	Sterling Drug, Inc., Thomasset Colors Div.
TNI	Gillette Co., Chemical Div.
UHL	Paul Uhlich & Co., Inc.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

MEDICINAL CHEMICALS

Tedford C. Briggs

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.

The table shows statistics for production and sales of medicinal chemicals grouped by pharmacological class. The statistics shown are for bulk chemicals only; finished pharmaceutical preparations and products put up in pills, capsules, tablets, or other measured doses are excluded.[1] The difference between production and sales reflects inventory changes, processing losses, and captive consumption of medicinal chemicals processed into ethical and proprietary pharmaceutical products by the primary manufacturer. In some instances, the difference may also include quantities of medicinal grade products used as intermediates, e.g., penicillin G salts used as intermediates in the manufacture of semi-synthetic penicillins. All quantities are given in terms of 100-percent content of the pure bulk drug.

Total U.S. production of bulk medicinal chemicals in 1976 amounted to 235.8 million pounds, or 13.2 percent more than the 208.4 million pounds produced in 1975 and 4.0 percent less than the 246.5 million pounds produced in 1974. Total sales of bulk medicinal chemicals in 1976 amounted to 160.8 million pounds, valued at $741.5 million, compared with sales in 1975 of 148.8 million pounds, valued at $772.1 million, and sales in 1974 of 177.5 million pounds, valued at $814.8 million.[2] In terms of quantity, sales in 1976 were thus 8.1 percent more than in 1975 and 9.0 percent less than in 1974. In terms of value, sales in 1976 were 4.0 percent less than in 1975 and 9.0 percent less than in 1974.[2]

Production of the more important groups of medicinal chemicals in 1976

---

[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 who 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.

[2] Sales value and, to a lesser extent, sales quantity were overstated in 1974 and 1975 because a company erroneously reported sales of an antiobiotic in dosage form.

was as follows: Antibiotics, 20.5 million pounds (12.0 percent more than in 1975), of which 10.4 million pounds was for medicinal use and 10.0 million pounds was for other uses; anti-infective agents other than antibiotics, 27.6 million pounds (3.0 percent less than in 1975); central nervous system depressants and stimulants, 52.7 million pounds (10.5 percent more); and vitamins, 33.3 million pounds (11.2 percent more).

Production of some of the more important individual products listed in the table was as follows: Choline chloride, 47.0 million pounds (21.5 percent larger than in 1975); aspirin, 28.3 million pounds (11.2 percent more); penicillins (except semi-synthetic), 7.1 million pounds (21.0 percent more); tetracyclines, 5.7 million pounds (22.0 percent more); and vitamin E, 4.6 million pounds (111.5 percent more).

Medicinal Chemicals

According to a recent report the drug industry suffered continued declines in profit margins in 1976. 1/ The study surveyed the performance of 10 major drug firms which account for more than 50 percent of the industry's profits and sales. In 1976, before-tax profits for the 10 companies were 15.2 percent of sales, down from 18.1 percent in 1975, 19.6 percent in 1974, and 21.0 percent in 1973. After-tax profits of the 10 firms climbed 9.1 percent in 1976 from 1975, whereas sales went up 10.8 percent. After-tax profits as a percentage of sales sank, therefore, even lower than 1975, which had the lowest value in more than a decade.

One factor in the profit decline is that patents have been running out on whole families of drugs developed during the 1950's, resulting in increased competition, especially foreign, and lower prices and profits for those products. Another factor lowering profits is pressure by the Department of Health, Education, and Welfare, for the prescribing of drugs by generic name rather than by the usually more costly brand-name products.

The drug industry benefits from heavy investment in offshore tax havens, chiefly Puerto Rico and Ireland. The tax rate for the 10 companies was 36.4 percent in 1976, up slightly from the 36.0-percent rate in 1975. Until 1976 the tax rate for drug companies had been dropping steadily since 1969, when it was 49 percent--the high point for the past decade.

One factor which would affect future growth in drug sales volume would be the passage of some form of national health insurance. With passage of such a program, the prescribing of drugs would be expected to increase.

The best hope for growth in drug profitability may be in the new generations of drugs. Here, the chief complaint from industry is Government regulations. Reportedly, before 1962, about 2 years usually elapsed between the discovery of a new drug and final approval by the Food and Drug Administation (FDA) for marketing. Now 7 to 10 years may be required because of increased time for tests to meet newer FDA regulations.

Future trends in the drug industry

Whole new generations of drugs, products of major breakthroughs in molecular biology and biochemistry, are building up in drug-company laboratories. Some have already been introduced abroad while others are awaiting FDA approval. Many of the newer drugs are hoped to be more specific in their actions so that they will attack only disease-causing agents or infected cells while having little or no toxic effect on the patient.

1/ "Drug Industry Performance Continues to Slip," Chemical and Engineering News, May 2, 1977, pp. 11-12.

245-856 O - 77 - 9

The empirical approach to drug development, in which thousands of organic chemicals are tested for therapeutic effects, is now giving way to specific drug design in which medicinal chemicals are modified in ways that are likely to produce desired results. Computer programs are sometimes used in the complex strategy involved in deciding which changes to make in a drug molecule so that it will precisely fit its intended target in the human body.

Among the new drug developments is a custom-designed drug with highly promising results in the treatment of peptic ulcers; another development is an antiviral drug believed to be present in the human body in minute amounts. This drug may have broad-spectrum antiviral activity and may eventually be used to destroy cold and flu virus. Another discovery is a possibly nonaddictive analgesic more effective than morphine. Drug companies have developed new antihypertensive agents and at least one drug that may be useful in the treatment of chronic heart failure. Some scientists feel that drugs that control the levels of cyclic nucleotides in the body will be useful in treating asthma and other diseases.

Another new approach in medicinal chemistry is the development of new drugs resembling hormones that either produce a metabolic response or block or reduce such a response. Antihistamines are an example of older drugs of this type in that these antagonists prevent the hormone histamine from binding to cell receptor sites. Not since the days of the discovery and development of cortisone has a natural hormone attracted so much attention in endocrinology, chemistry, and pharmacology as have the prostaglandins. Most major drug companies have active drug development programs focused around the chemistry of these potent and multiaction natural hormones. In addition, receptor research recently led to the discovery of a new class of brain hormones which appear to mediate a large number of brain functions.

So, while the introduction of new drugs has slowed in the last 10 years, most drug companies remain optimistic about the future of the industry. In view of Government and industry spending, medicinal chemistry is one of the more active areas in the chemistry of the organic compounds. 1/

Production of drugs in Puerto Rico and in Ireland

Puerto Rico will strengthen its position as one of the principal producing areas for medicinal chemicals when a new $70 million plant built by Hoffman-LaRoche reaches full production in 1978. 2/ Hoffman-LaRoche joins a host of other pharmaceutical companies with plants in Puerto Rico, including Eli Lilly, Upjohn, Squibb, Bristol Myers, Merck, Sharp and Dohme, Searle, Smith Kline & French, Warner-Lambert, Abbott, Johnson & Johnson, Parke Davis, Richardson Merrell, Baxter Travenol, Lenderele, Seifel, Pfizer, Schering Plough, Sterling Drug, and Endo Labs.

1/ Donald A. Buyske, "Drugs from Nature," Chemtech, June 1975, pp.361-369. "Future Drugs That Will Be Lifesavers," Fortune, December 1976, pp. 152-162.

2/ "Roche Opening of Pharmaceutical Unit Seen as Spur to Puerto Rico Drug Trade," Chemical Marketing Reporter, Dec. 12, 1976.

In 10 years the value of exports of drugs from Puerto Rico has increased from $31.4 million in 1966 to $352.6 million in 1976. Employment in the industry was up to 6,300 in 1976. The principal incentive for locating plants in Puerto Rico is the 10 to 30 years of tax exemption. Other factors are, reportedly, good worker productivity and a favorable climate.

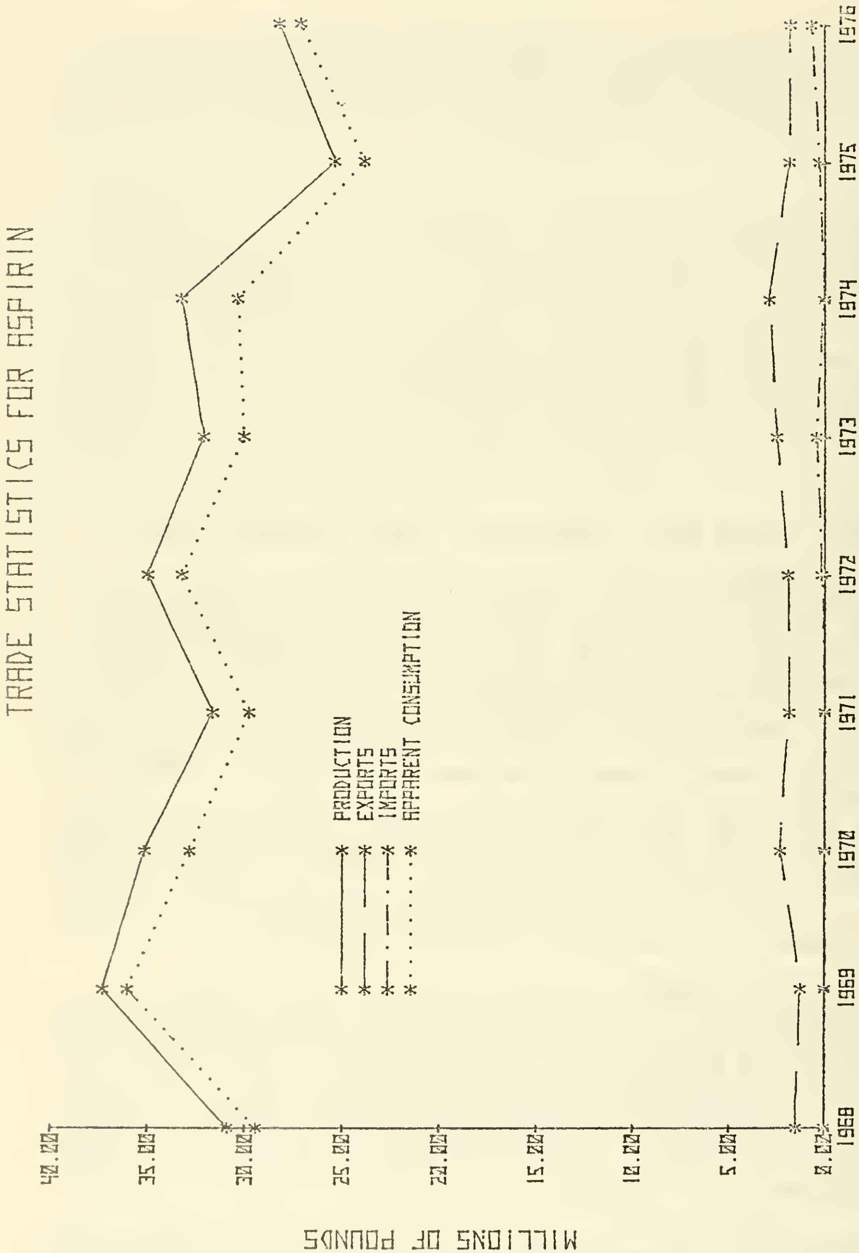
Another area noted for its concentration of pharmaceutical plants is the Republic of Ireland. Production plants owned by 11 of the world's top 16 drug companies are located in Ireland. Ireland's attraction to drug producers, like that of Puerto Rico, is the tax exemption given for plants located in Ireland. Ireland gives complete tax exemption on export-derived profits until 1990, and Ireland reportedly exports over 95 percent of its drug production. There have been reports that changes will be imposed by the European Economic Community Commission in Brussels to reduce Ireland's tax holiday, presumably as part of its long-promised harmonization of European Community investment incentives. The Industrial Development Authority of Ireland declares, however, that there will be no changes in any existing agreements. Another incentive offered to industry by Ireland are grants ranging from $6,000 to $10,000 for each job created. 1/

Production, foreign trade, consumption, and market trends of aspirin

Aspirin (acetylsalicylic acid) has been used to relieve pain, inflammation, and fever since 1899. Consumption of aspirin is probably more than that of any other drug with about 27 million pounds consumed during 1976 in the United States alone. The following figure shows a general declining trend in domestic aspirin production and consumption during 1968-76. The principal factor believed to be responsible for the decline in aspirin consumption is the substitution of acetaminophen by many individuals who formerly used aspirin. Imports are not yet a major factor in the aspirin market, accounting for less than 3 percent of domestic consumption in 1976. This does not mean, however, that imports of aspirin will not become important. And, in fact, there are reasons to expect that imports will capture an increasing share of the domestic market. Imports jumped from none in 1971 to 164,000 pounds in 1972 and 702,000 pounds in 1976. In 1975 almost all of the imports came from Poland, while in 1976 most of the imports of aspirin came from Poland and Romania. Exports of aspirin peaked in 1974 and declined in the 2 subsequent years.

The decline in aspirin consumption will probably not continue as aspirin remains one of the most effective drugs for the treatment of connective-tissue diseases such as arthritis. These diseases affect, to a varying degree, a large segment of the population with the incidence generally increasing with age. Demographers predict a steady increase in median age of the domestic population, and it is reasonable to predict increased use of the drugs effective in geriatrics. Domestic production may continue to decline as aspirin is a low-cost drug widely made throughout the world.

1/ "Another U.S. Pharmaceutical Project for Ireland," European Chemical News, Sept. 10, 1976.


TRADE STATISTICS FOR ASPIRIN
PRODUCTION
EXPORTS
IMPORTS
APPARENT CONSUMPTION
MILLIONS OF POUNDS
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1968
1969
1970
1971
1972
1973
1974
1975
1976

Production may shift to those countries that have the lowest production cost.

Studies are now underway to determine if aspirin is useful in preventing heart attacks. Aspirin is known to block prostaglandin synthesis and is being tested in a clinical study sponsored by the National Heart, Lung and Blood Institute to see whether aspirin can protect against heart attacks. It is known that some of the prostaglandins promote blood clotting and some scientists feel prostaglandins may be important in the processes causing heart attacks or stroke. However, the discovery in late 1976 that some of the prostaglandins inhibit blood clotting and arterial contraction has led some investigators to question whether taking aspirin would, in fact, prevent heart attacks. Perhaps the trial called the aspirin myocardial infarction study (AMIS) will answer these questions. The test group includes over 4,000 patients who have suffered at least one heart attack. The experimental phase of AMIS will be completed by August 1979, and the results will be closely watched by the medical profession.

In late 1976 a review panel studying nonprescription drugs for the FDA recommended that labeling of over-the-counter pain relievers, such as aspirin and acetaminophen, be restricted to indicate use for headaches, minor aches and pain, and fever. The panel also recommended warnings on the labels about the dangers of overdosage. Drug industry reaction to the recommendations was fear that the $715 million market for the mild pain relievers would be severely hurt if patients are forced to rely on more expensive and powerful, and possibly more toxic, prescription drug products for relief of specific pain symptoms. The panel's recommendations were based upon its desire to curb what it feels is an overuse of nonprescription pain relievers. The FDA is studying the panel's proposals before taking action.

MEDICINAL CHEMICALS

TABLE 1.--MEDICINAL CHEMICALS: U.S. PRODUCTION AND SALES, 1976

[Listed below are all synthetic organic medicinal chemicals for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists all medicinal chemicals for which data on production and/or sales were reported and identifies the manufacturers of each]

MEDICINAL CHEMICALS	PRODUCTION[1]	SALES[1] QUANTITY	SALES[1] VALUE	SALES[1] UNIT VALUE[2]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	235,805	160,834	741,521	$ 4.61
Acyclic	99,431	81,253	98,692	1.21
Benzenoid[3]	114,905	63,140	402,117	6.37
Cyclic nonbenzenoid[4]	21,469	16,441	240,712	14.64
Antibiotics, total[5]	20,472	6,520	211,529	32.44
Penicillins (except semisynthetic), total	7,132	2,888	34,365	11.90
Penicillin G, potassium for medicinal use	2,182	...	...	...
All other, for all uses	4,950	2,888	34,365	11.90
Semisynthetic penicillins, for medicinal use, total	1,433	485	43,121	88.91
Ampicillin	900	...	...	...
All other	533	485	43,121	88.91
Tetracyclines, for all uses	5,695	378	16,763	44.35
Other antibiotics, total	6,212	2,769	117,280	42.35
For medicinal use[6]	2,680	848	92,166	108.69
For nonmedicinal uses[7]	3,532	1,921	25,114	13.07
Antihistamines, total	489	231	6,459	27.96
Chlorpheniramine maleate	30	...	...	...
All other	459	231	6,459	27.96
Anti-infective agents (except antibiotics), total	27,640	15,693	72,412	4.61
Anthelmintics, total	11,133	6,116	36,363	5.95
Piperazine dihydrochloride	1,649	1,517	2,021	1.33
All other	9,484	4,599	34,342	7.47
Antifungal agents	820	870	1,310	1.51
Antiprotozoan agents	7,079	4,760	17,871	3.75
Sulfonamides	4,015	1,361	7,708	5.66
Urinary antiseptics	399	...	...	...
Other anti-infective agents[8]	4,194	2,586	9,160	3.54
Autonomic drugs, total	987	695	12,325	17.73
Parasympatholytic (anticholinergic) tertiary amines (except tropane derivatives)	58	...	...	...
Sympathomimetic (adrenergic) agents, total	877	649	9,795	15.09
Phenylpropanolamine hydrochloride	426	...	...	...
All other	451	649	9,795	15.09
Other autonomic drugs	52	46	2,530	55.00
Cardiovascular and hematological agents, total	2,334	150	12,026	80.17
Sodium heparin	...	4	9,635	2,408.75
All other	2,334	146	2,391	16.38
Central depressants and stimulants, total	52,676	38,723	132,782	3.43
Analgesics and antipyretics, total	46,185	33,514	70,137	2.09
Aspirin	28,282	...	...	...
Meperidine hydrochloride	29	...	...	...
Methadone hydrochloride	2	...	...	...
All other	17,872	33,514	70,137	2.09
Antidepressants	147	...	...	...
Antitussives	176	134	34,576	258.03
Hypnotics and sedatives (including barbiturates)	1,231	566	4,308	7.61
Skeletal muscle relaxants	493	500	4,518	9.04
Tranquilizers	609	...	...	...
Other central depressants and stimulants[9]	3,835	4,009	19,243	4.80
Dermatological agents (except salicylic acid) and local anesthetics	779	776	1,863	2.40

See footnotes at end of table.

TABLE 1.--MEDICINAL CHEMICALS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

MEDICINAL CHEMICALS	PRODUCTION[1]	SALES[1]		
		QUANTITY	VALUE	UNIT VALUE[2]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Expectorants and mucolytic agents, total	1,924	1,676	7,351	$4.39
Ethylenediamine dihydriodide	1,307	1,186	4,334	3.65
All other	617	490	3,017	6.16
Gastrointestinal agents (except methionine, hydroxy analog), total	49,485	42,540	21,324	.50
Choline chloride (all grades)	47,009	38,656	16,774	.43
All other	2,476	3,884	4,550	1.17
Hormones and synthetic substitutes, total	1,032	151	74,422	492.86
Synthetic hypoglycemic agents	899	...	...	...
Thyroid hormone and antithyroid agents	19	...	...	...
All other	114	151	74,422	492.86
Renal-acting and edema-reducing agents, total	1,954	299	5,391	18.03
Benzothiadiazine derivatives	...	121	3,817	31.55
Theophylline derivatives	206	...	...	...
All other	1,748	178	1,574	8.84
Therapeutic nutrients	1,318	1,117	4,076	3.65
Vitamins, total	33,315	22,746	142,527	6.27
Vitamin B	8,017	8,705	38,783	4.46
Vitamin D[10]	13	9	2,754	306.00
Vitamin E, total[10]	4,595	3,406	48,573	14.26
All other vitamins	20,690	10,626	52,417	4.93
Miscellaneous medicinal chemicals[11]	41,400	29,517	37,034	1.25

[1] The data on production and sales are for bulk medicinal chemicals only; they *exclude* finished preparations and dosage-form products, which are manufactured from bulk chemicals. All quantities are given in terms of 100% active ingredients.

[2] Calculated from rounded figures.

[3] The term "benzenoid " as used in this report, describes any cyclic medicinal chemical whose molecule contains either a six-membered carbocyclic ring with conjugated double bonds (e.g., the benzene ring or the quinone ring) or a six-membered heterocyclic ring with 1 or 2 hetero atoms and conjugated double bonds, except the pyrimidine ring (e.g., the pyridine ring or the pyrazine ring.)

[4] Includes antibiotics of unknown structure.

[5] With the exception of bacitracin, the penicillins (except semisynthetic), and a few other antibiotics which were reported in terms of U.S.P. units, all quantities for antibiotics were reported as kilograms (kg) of antibiotic base. (Thus production of 481 kg of tetracycline hydrochloride, for example, would have been reported as 444 kg of tetracycline base.) For inclusion in the statistical table, all quantities were converted from kg of antibiotic base to pounds of antibiotic base (1 kg = 2.2046 pounds), or from U.S.P. units to pounds (22.7 million units of bacitracin, 458 million units of procaine pencillin G, 723 million units of potassium penicillin G, etc. = 1 pound). Sales quantity and value are lower than in previous years because in previous years a significant quantity of an antibiotic in dosage form was reported incorrectly as sales.

[6] Production of all antibiotics for medicinal use amounted to 10,438,000 pounds, sales amounted to 2,741,000 pounds, valued at $162,299,000. Includes antifungal and antitubercular antibiotics.

[7] Production of all antibiotics for animal feeds and other nonmedicinal uses amounted to 10,034,000 pounds, sales amounted to 3,779,000 pounds, valued at $49,230,000.

[8] Includes sales of urinary antiseptics.

[9] Includes production and sales of amphetamines, general anesthetics, and stimulants; also includes sales of antidepressants and tranquilizers.

[10] All quantities for vitamins A, B_{12}, D, and E were reported in terms of kg or units, but were converted to pounds for inclusion in the statistical table (1.317 billion units of vitamin A acetate, 0.824 billion units of vitamin A palmitate, 0.4536 kg of vitamins B_{12}, 18.14 billion units of vitamin D, 617,000 units of d-alpha tocopheryl acetate, 454,000 units of dl-alpha tocopheryl acetate, etc. = 1 pound.)

[11] Includes production and sales of antineoplastic agents, diagnostic agents, methionine (hydroxy analog, calcium salt), salicylic acid, smooth muscle relaxants, and unclassified medicinal chemicals.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS' IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AN "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ANTIBIOTICS:	
ANTIFUNGAL AND ANTITUBERCULAR ANTIBIOTICS, FOR MEDICINAL USE:	
ANTIFUNGAL ANTIBIOTICS:	
AMPHOTERICIN B	OMS, TRD.
CANDICIDIN	PEN.
NYSTATIN (MEDICINAL GRADE)	ACY, OMS, TRD.
ANTITUBERCULAR ANTIBIOTICS:	
CYCLOSERINE	IMC.
DIHYDROSTREPTOMYCIN	MRK, PFZ.
STREPTOMYCIN (MEDICINAL GRADE)	LIL, MRK, PFZ.
@PENICILLINS, SEMI-SYNTHETIC:	
AMOXICILLIN	BEE, BOC.
@AMPICILLIN	BEE, BOC, BRS, TRD, WYT.
AMPICILLIN, SODIUM	BEE, BRS, OMS, WYT.
CARBENICILLIN, DISODIUM	BEE, PFZ.
CLOXACILLIN, SODIUM	BEE, BRS.
DICLOXACILLIN, SODIUM	BEE, BRS.
HETACILLIN	BRS.
METHICILLIN, SODIUM	BEE, BRS.
NAFCILLIN, SODIUM	BEE, BRS, WYT.
OXACILLIN, SODIUM	BEE, BRS.
TICARCILLIN	BEE.
@PENICILLINS (EXCEPT SEMI-SYNTHETIC):	
FOR MEDICINAL USE:	
PENICILLIN G, BENZATHINE	WYT.
@PENICILLIN G, POTASSIUM	LIL, OMS, PFZ, WYT.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ANTIBIOTICS--CONTINUED	
@PENICILLINS (EXCEPT SEMI-SYNTHETIC)--CONTINUED	
FOR MEDICINAL USE--CONTINUED	
PENICILLIN G, PROCAINE (MEDICINAL GRADE)	LIL, OMS, PFZ, WYT.
PENICILLIN G, SODIUM	OMS, PFZ.
PHENOXYMETHYLPENICILLIN (PENICILLIN V)	BRS, LIL, OMS, PFZ, WYT.
PHENOXYMETHYLPENICILLIN, POTASSIUM	BRS, LIL.
FOR NONMEDICINAL USES:	
PENICILLIN G, PROCAINE (ANIMAL FEED GRADE)	MRK, OMS, PFZ.
@TETRACYCLINES:	
FOR MEDICINAL USE:	
CHLORTETRACYCLINE	ACY.
DEMECLOCYCLINE	ACY.
DOXYCYCLINE	PFZ.
METHACYCLINE	PFZ.
MINOCYCLINE	ACY.
OXYTETRACYCLINE (MEDICINAL GRADE)	PFZ.
TETRACYCLINE	ACY, PFZ.
FOR NONMEDICINAL USES:	
CHLORTETRACYCLINE (ANIMAL FEED GRADE)	ACY, RLS.
OXYTETRACYCLINE (ANIMAL FEED GRADE)	PFZ.
@OTHER ANTIBIOTICS:	
@FOR MEDICINAL USE:[1]	
CEPHALOSPORINS:	
CEFAZOLIN	LIL, SK.
CEPHALEXIN	LIL.
CEPHALORIDINE	LIL.
CEPHALOTHIN	LIL.
CEPHAPIRIN, SODIUM	BRS.
CEPHRADINE	SK, TRD.
OTHER THAN CEPHALOSPORINS:	
BACITRACIN (MEDICINAL GRADE)	IMC.
CHLORAMPHENICOL	PD, RLS.
CLINDAMYCIN	UPJ.
ERYTHROMYCIN	LIL, UPJ.
ERYTHROMYCIN ESTOLATE	LIL.
GENTAMYCIN	SCH.
KANAMYCIN	BRS.
LINCOMYCIN	UPJ.

SEE FOOTNOTES AT END OF TABLE.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ANTIBIOTICS--CONTINUED	
@OTHER ANTIBIOTICS--CONTINUED	
@FOR MEDICINAL USE[1]--CONTINUED	
OTHER THAN CEPHALOZPORINS--CONTINUED	
NEOMYCIN (MEDICINAL GRADE)	PEN, PFZ, UPJ.
NOVOBIOCIN (MEDICINAL GRADE)	UPJ.
POLYMYXIN B	PFZ.
ROSAMICIN	X.
SPECTINOMYCIN (MEDICINAL GRADE)	ABB, UPJ.
THIOSTREPTON	OMS.
TYROTHRICIN	PEN.
VANCOMYCIN	LIL.
@FOR NONMEDICINAL USES:	
BACITRACIN (ANIMAL FEED GRADE)	IMC, PEN.
CYCLOHEXIMIDE	UPJ.
HYGROMYCIN B	LIL.
LASALOCID	HOF.
LINCOMYCIN (ANIMAL FEED GRADE)	UPJ.
MONENSIN, SODIUM	LIL.
NEOMYCIN (ANIMAL FEED GRADE)	OMS, PFZ.
NOVOBIOCIN (ANIMAL FEED GRADE)	UPJ.
NYSTATIN (ANIMAL FEED GRADE)	OMS.
SPECTINOMYCIN (ANIMAL FEED GRADE)	UPJ.
STREPTOMYCIN	MRK, PFZ.
TYLOSIN	LIL.
@ANTIHISTAMINES:	
ANTINAUSEANTS:	
CYCLIZINE HYDROCHLORIDE	BUR.
DIMENHYDRINATE	SRL.
MECLIZINE HYDROCHLORIDE	PFZ.
TRIMETHOBENZAMIDE HYDROCHLORIDE	HOF.
OTHER ANTIHISTAMINES:	
BROMODIPHENHYDRAMINE HYDROCHLORIDE	PD.
BROMPHENIRAMINE MALEATE	HEX, SCH.
CHLORCYCLIZINE HYDROCHLORIDE	BUR.
@CHLORPHENIRAMINE MALEATE	HEX, SCH, SK.
CHLORPHENIRAMINE TANNATE	MAL.
CYPROHEPTADINE HYDROCHLORIDE	MRK.
DEXBROMPHENIRAMINE MALEATE	SCH.
DEXCHLORPHENIRAMINE	SCH.

SEE FOOTNOTES AT END OF TABLE.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ANTIHISTAMINES--CONTINUED	
OTHER ANTIHISTAMINES--CONTINUED	
DIMETHINDENE MALEATE	CGY.
DIPHENHYDRAMINE HYDROCHLORIDE	GAN, PD.
DOXYLAMINE SUCCINATE	BJL, BKC.
METHAPYRILENE FUMARATE	ABB.
METHAPYRILENE HYDROCHLORIDE	ABB, MON.
METHDILAZINE	BJL.
PHENINDAMINE TARTRATE	HOF.
PHENIRAMINE MALEATE	HEX.
PHENYLTOLOXAMINE CITRATE	X.
PYRILAMINE MALEATE	HEX.
PYRILAMINE RESIN ADSORBATE	MRK.
PYRILAMINE TANNATE	MAL.
PYRROBUTAMINE PHOSPHATE	LIL.
TRIPELENNAMINE	CGY.
TRIPELENNAMINE CITRATE	CGY.
TRIPELENNAMINE HYDROCHLORIDE	CGY.
TRIPROLIDINE HYDROCHLORIDE	BUR.
@ANTI-INFECTIVE AGENTS (EXCEPT ANTIBIOTICS):	
@ANTHELMINTICS:	
DICHLORVOS	SHC.
DIETHYLCARBAMAZINE CITRATE	ACY.
GENTIAN VIOLET	SDH.
HEXYLRESORCINOL	MRK.
PHENOTHIAZINE (MEDICINAL GRADE)	WAG.
PIPERAZINE	DOW, JCC.
PIPERAZINE CITRATE	BUR, JCC.
@PIPERAZINE DIHYDROCHLORIDE	DOW, FLM, JCC, WHL.
PIPERAZINE HEXAHYDRATE	JCC.
PIPERAZINE HYDROCHLORIDE	DOW, FLM, JCC.
PIPERAZINE PHOSPHATE	JCC.
PYRANTEL PAMOATE	PFZ.
PYRANTEL TARTRATE	PFZ.
RAFOXANIDE	MRK.
THIABENDAZOLE	MRK.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ANTI-INFECTIVE AGENTS (EXCEPT ANTIBIOTICS)--CONTINUED	
@ANTIPROTOZOAN AGENTS:	
ARSENIC AND BISMUTH COMPOUNDS:	
ARSANILIC ACID	ABB, PLM.
BISMUTH SUBSALICYLATE	MAL, NOR, PEN.
CARBARSONE	LIL, WHL.
GLYCOBIARSOL	SDW.
NITARSONE	SAL.
ROXARSONE	SAL.
SODIUM ARSANILATE	ABB.
OTHER ANTIPROTOZOAN AGENTS:	
AKLOMIDE	SAL.
AMODIAQUIN HYDROCHLORIDE	PD.
AMPROLIUM	MRK.
CLOPIDOL	DOW.
DIMETRIDAZOLE	RDA.
3,5-DINITRO-ORTHO-TOLUAMIDE	DOW.
FURAZOLIDONE	NOR.
HYDROXYCHLOROQUINE SULFATE	SDW.
IODOCHLORHYDROXYQUIN	CGY.
METRONIDAZOLE	RDA.
NIFUROXIME	NOR.
NITROMIDE	SAL.
PRIMAQUINE PHOSPHATE	SDW.
PYRIMETHAMINE	BUR.
@SULFONAMIDES:	
DINSED	SAL.
MAFENIDE HYDROCHLORIDE	SDW.
PHTHALYLSULFACETAMIDE	LEM.
SULFASALAZINE	SAL.
SULFABENZAMIDE	ACY.
SULFABENZAMIDE, SODIUM	ACY.
SULFABROMOMETHAZINE, SODIUM	MRK.
SULFACETAMIDE	LEM.
SULFACETAMIDE, SODIUM	LEM.
SULFACHLOROPYRAZINE, SODIUM	ACY.
SULFADIAZINE	ACY.
SULFADIMETHOXINE	HOF.
SULFAMERAZINE	ACY.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ANTI-INFECTIVE AGENTS (EXCEPT ANTIBIOTICS)--CONTINUED	
@SULFONAMIDES--CONTINUED	
SULFAMETHAZINE	ACY, LEM, RLS.
SULFAMETHAZINE, SODIUM	LEM, SAL.
SULFAMETHIZOLE	ACY.
SULFAMETHOXAZOLE	HOF.
SULFANILAMIDE	SAL.
SULFANILYLCYTOSINE	PD.
SULFANITRAN	SAL.
SULFAPYRIDINE	ACY, LEM, SAL.
SULFAQUINOXALINE	LEM, MRK.
SULFATHIAZOLE	MRK.
SULFATHIAZOLE, SODIUM	MRK, SAL.
SULFISOXAZOLE	HOF.
@OTHER ANTI-INFECTIVE AGENTS:	
@ANTIFUNGAL AGENTS:	
BENZOIC ACID	MON.
CALCIUM UNDECYLENATE	WTL.
SODIUM CAPRYLATE	LEM.
UNDECYLENIC ACID	NTL.
ZINC UNDECYLENATE	NTL, WTL.
ANTILEPROTIC AND ANTITUBERCULAR AGENTS:	
AMINOSALICYLIC ACID	MLS.
ISONIAZID	RIL.
SODIUM AMINOSALICYLATE	MLS.
ANTIVIRAL AGENTS:	
AMANTADINE	ALD.
MERCURY COMPOUNDS:	
MERBROMIN	HYN.
THIMEROSAL	LIL.
@URINARY ANTISEPTICS:	
METHENAMINE HIPPURATE	RIK.
METHENAMINE MANDELATE	ARN, NEP.
METHYLENE BLUE	ACY.
NITROFURANTOIN	NOR.
PHENAZOPYRIDINE HYDROCHLORIDE	HOF, NEP.
GENERAL ANTISEPTICS AND ANTIBACTERIAL AGENTS:	
AMINACRINE HYDROCHLORIDE	SDW.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ANTI-INFECTIVE AGENTS (EXCEPT ANTIBIOTICS)--CONTINUED	
@OTHER ANTI-INFECTIVE AGENTS--CONTINUED	
GENERAL ANTISEPTICS AND ANTIBACTERIAL AGENTS--CONTINUED	
BENZALKONIUM CHLORIDE	SDW.
BETANAPTHOL	ACY.
BROMOFORM	DOW.
CARBADOX	PEN, PFZ.
CETALKONIUM CHLORIDE	FIN, SDW.
CETYLPYRIDINIUM CHLORIDE	FIN, HEX.
CHLOROBUTANOL	SPS.
CHLOROTHYMOL	OPC.
8-HYDROXY-5-QUINOLINESULFONIC ACID	MRK.
IODOFORM	MAL, PEN.
NALIDIXIC ACID	SDH.
OXOLINIC ACID	NEP.
OXYQUINOLINE	ASH, MRK.
OXYQUINOLINE BENZOATE	LEM.
OXYQUINOLINE CITRATE	ASH, MRK.
OXYQUINOLINE SULFATE	ASH, LEM, MRK.
OXYQUINOLINE ZINC	MRK.
POVIDONE - IODINE COMPLEX	GAF.
RESORCINOL	KPT.
THYMOL	GIV.
THYMOL IODIDE	MAL.
TRIMETHOPRIM	BUR.
@AUTONOMIC DRUGS:	
@SYMPATHOMIMETIC AGENTS:	
CINNAMEDRINE HYDROCHLORIDE	SDW.
CYCLOPENTAMINE HYDROCHLORIDE	LIL.
EPHEDRINE	UPJ.
ISOPROTERENOL HYDROCHLORIDE	SDW.
LEVARTERENOL BITARTRATE	SDW.
MEPHENTERMINE	ARA.
METARAMINOL BITARTRATE	MRK.
METHOXYPHENAMINE HYDROCHLORIDE	MLS.
NAPHAZOLINE HYDROCHLORIDE	CGY.
NORDEFRIN HYDROCHLORIDE	SDW.
NYLIDRIN HYDROCHLORIDE	BKL.
PHENYLEPHRINE	SDW.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@AUTONOMIC DRUGS--CONTINUED	
@SYMPATHOMIMETIC AGENTS--CONTINUED	
PHENYLEPHRINE HYDROCHLORIDE	GAN, SDW.
@PHENYLPROPANOLAMINE HYDROCHLORIDE	ARS, GAN, NEP, ORT, X.
PROPYLHEXEDRINE	SK.
PSEUDOEPHEDRINE HYDROCHLORIDE	BUR, GAN, SDW, UPJ.
PSEUDOEPHEDRINE SULFATE	GAN.
TETRAHYDROZOLINE HYDROCHLORIDE	PFZ.
@OTHER AUTONOMIC DRUGS:	
GANGLIONIC BLOCKING AGENTS:	
TETRAETHYLAMMONIUM CHLORIDE	RSA.
PARASYMPATHOLYTIC QUATERNARY AMMONIUM COMPOUNDS (EXCEPT TROPANE DERIVATIVES):	
CARBIDOPA	MRK.
DIPHEMANIL METHYLSULFATE	SCH.
HEXOCYCLIUM METHYLSULFATE	ABB.
ISOPROPAMIDE IODIDE	SK.
MEPENZOLATE BROMIDE	LKL.
TRIDIHEXETHYL IODIDE	ACY.
@PARASYMPATHOLYTIC TERTIARY AMINES (EXCEPT TROPANE DERIVATIVES):	
ADIPHENINE HYDROCHLORIDE	CGY.
CYCRIMINE HYDROCHLORIDE	LIL.
DICYCLOMINE HYDROCHLORIDE	BKC.
ORPHENADRINE CITRATE	PD, RIK.
OXYPHENCYCLIMINE HYDROCHLORIDE	PFZ.
PIPERIDOLATE HYDROCHLORIDE	LKL.
TRIHEXYPHENIDYL HYDROCHLORIDE	ACY, SDW.
PARASYMPATHOLYTIC TROPANE DERIVATIVES:	
ANISOTROPINE METHYLBROMIDE	ARA.
BENZTROPINE MESYLATE	ARA.
HOMATROPINE HYDROBROMIDE	ARA.
HOMATROPINE METHYLBROMIDE	ARA.
PARASYMPATHOMIMETIC AGENTS:	
PYRIDOSTIGMINE BROMIDE	HOF.
URECHOLINE CHLORIDE	MRK.
SYMPATHOLYTIC AGENTS:	
ERGONOVINE MALEATE	LIL.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@CARDIOVASCULAR AND HEMATOLOGICAL AGENTS:	
CARDIOVASCULAR AGENTS:	
ANTIHYPERTENSIVE AGENTS:	
DIAZOXIDE	SCH.
GUANETHIDINE SULFATE	CGY.
HYDRALAZINE HYDROCHLORIDE	CGY.
METHYLDOPA	MRK.
PHENOXYBENZAMINE HYDROCHLORIDE	SK.
RESERPINE	PEN.
BIOFLAVONOIDS:	
HESPERIDIN	SKG.
LEMON BIOFLAVONOID COMPLEX	SKG.
NARINGIN	SKG.
VASODILATORS:	
AMYL NITRITE	MAL.
DIOXYLINE PHOSPHATE	LIL.
NICOTINYL ALCOHOL TARTRATE	HOF.
OTHER CARDIOVASCULAR AGENTS:	
PROCAINAMIDE HYDROCHLORIDE	LEM, OMS, PD.
HEMATOLOGICAL AGENTS:	
AMMONIUM HEPARIN	ABB, RIK, WIL.
ANISINDIONE	SCH.
CELLULOSE, OXIDIZED	EKT.
DEXTRAN	PHR.
DIPHENADIONE	UPJ.
LITHIUM HEPARIN	ABB, RIK, WIL.
POTASSIUM WARFARIN	RSA.
@SODIUM HEPARIN	ABB, RIK, WIL.
@CENTRAL DEPRESSANTS AND STIMULANTS:	
@ANALGESICS, ANTIPYRETICS, AND NONHORMONAL ANTI-INFLAMMATORY AGENTS:	
SALICYLIC ACID DERIVATIVES:	
ALUMINUM ASPIRIN	ABB.
@ASPIRIN	DOW, KVP, MLS, MON, NOR, SDG.
DIFLUNISAL	MRK.
PHENYL SALICYLATE	DOW.

245-856 O - 77 - 10

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@CENTRAL DEPRESSANTS AND STIMULANTS--CONTINUED	
@ANALGESICS, ANTIPYRETICS, AND NONHORMONAL ANTI-INFLAMMATORY AGENTS--CONTINUED	
SALICYLIC ACID DERIVATIVES--CONTINUED	
POTASSIUM SALICYLATE	HN.
SALICYLAMIDE	PEN.
SALICYLSALICYLIC ACID	PD.
SODIUM SALICYLATE	HN.
@OTHER ANALGESICS AND ANTIPYRETICS:[2]	
ACETAMINOPHEN	ARA, ATP, MAL, MLS, NEP, NOR, PEN, SDH.
AMINOBENZOIC ACID	ARA, GAN.
AUROTHIOGLUCOSE	SCH.
CALCIUM SUCCINATE	LEM.
ETHOHEPTAZINE CITRATE	WYT.
GOLD SODIUM THIOMALATE	MRK.
IBUPROFEN	CWN, UPJ.
INDOMETHACIN	MRK.
MECLOFENAMIC ACID, SODIUM SALT	PD.
MEFENAMIC ACID	PD.
@MEPERIDINE HYDROCHLORIDE	PEN, SDW, WYT.
@METHADONE HYDROCHLORIDE	LIL, MAL, PEN.
MORPHINE	MRK, X.
NAPROXEN	ARA.
OXYCODONE HYDROCHLORIDE	EN.
OXYCODONE TEREPHTHALATE	EN.
OXYPHENBUTAZONE	CGY(E).
PHENACETIN	MON.
PHENYLBUTAZONE	CGY(E).
POTASSIUM AMINOBENZOATE	GAN.
PROPOXYPHENE HYDROCHLORIDE	LIL.
PROPOXYPHENE NAPSYLATE	LIL.
SODIUM AMINOBENZOATE	GAN.
@ANTICONVULSANTS, HYPNOTICS, AND SEDATIVES:	
ANTICONVULSANTS (EXCEPT BARBITURATES):	
DIPHENYLHYDANTOIN	PD.
DIPHENYLHYDANTOIN, SODIUM	PD.
ETHOSUXIMIDE	PD.
ETHOTOIN	ABB.
METHSUXIMIDE	PD.
PHENACEMIDE	ABB.

SEE FOOTNOTES AT END OF TABLE.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@CENTRAL DEPRESSANTS AND STIMULANTS--CONTINUED	
@ANTICONVULSANTS, HYPNOTICS, AND SEDATIVES--CONTINUED	
ANTICONVULSANTS (EXCEPT BARBITURATES)--CONTINUED	
PHENSUXIMIDE	PD.
BARBITURATES:	
AMOBARBITAL	GAN.
AMOBARBITAL, SODIUM	GAN.
BARBITAL	GAN.
BARBITAL, SODIUM	GAN.
BUTABARBITAL	ABB, GAN.
BUTABARBITAL, SODIUM	ABB, GAN.
HEXOBARBITAL	GAN.
MEPHOBARBITAL	SDW.
METHOHEXITAL, SODIUM	LIL.
PENTOBARBITAL	ABB, GAN.
PENTOBARBITAL, SODIUM	ABB, GAN.
PHENOBARBITAL	GAN, MAL.
PHENOBARBITAL, SODIUM	GAN.
SECOBARBITAL	GAN.
SECOBARBITAL, SODIUM	GAN, LIL.
TALBUTAL	ABB.
THIAMYLAL, SODIUM	PD.
THIOPENTAL, SODIUM	ABB.
HYPNOTICS AND SEDATIVES (EXCEPT BARBITURATES):	
CARBROMAL	PD.
ETHCHLORVYNOL	ABB.
FLURAZEPAM HYDROCHLORIDE	HOF.
GLUTETHIMIDE	BKL, CGY, GAN.
METHAQUALONE	X.
METHAQUALONE HYDROCHLORIDE	X.
METHYPRYLON	HOF.
TRICLOFOS, SODIUM	LKL.
PSYCHOTROPIC AGENTS:	
@ANTIDEPRESSANTS:	
AMICARBINOL	MRK.
AMITRIPTYLINE	MRK.
DESIPRAMINE HYDROCHLORIDE	CGY(E), LKL.
DOXEPIN HYDROCHLORIDE	PFZ, SK.
IMIPRAMINE HYDROCHLORIDE	CGY(E).

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@CENTRAL DEPRESSANTS AND STIMULANTS--CONTINUED	
PSYCHOTROPIC AGENTS--CONTINUED	
@ANTIDEPRESSANTS--CONTINUED	
NORTRIPTYLINE	LIL.
@TRANQUILIZERS:	
PHENOTHIAZINE DERIVATIVES:	
ACETOPHENAZINE MALEATE	SCH.
CHLORPROMAZINE HYDROCHLORIDE	SK.
FLUPHENAZINE HYDROCHLORIDE	SCH.
PERPHENAZINE	SCH.
PROCHLORPERAZINE EDISYLATE	SK.
PROCHLORPERAZINE MALEATE	SK.
PROMAZINE HYDROCHLORIDE	WYT.
PROMETHAZINE HYDROCHLORIDE	WYT.
OTHER TRANQUILIZERS:	
BUCLIZINE HYDROCHLORIDE	PFZ.
CHLORDIAZEPOXIDE HYDROCHLORIDE	HOF, SK.
CHLORMEZANONE	SDW.
CLORAZEPATE DIPOTASSIUM	ABB.
DIAZEPAM	HOF.
HYDROXYZINE HYDROCHLORIDE	PFZ.
HYDROXYZINE PAMOATE	PFZ.
MEPROBAMATE	BKL.
MOLINDONE HYDROCHLORIDE	X.
OXAZEPAM	WYT.
@OTHER CENTRAL DEPRESSANTS AND STIMULANTS:[3]	
AMPHETAMINES:	
AMPHETAMINE	ARN.
AMPHETAMINE SULFATE	ARN.
DEXTROAMPHETAMINE	ARN.
DEXTROAMPHETAMINE SULFATE	ARN, SK.
METHAMPHETAMINE	ARN.
METHAMPHETAMINE HYDROCHLORIDE	ARN.
@ANTITUSSIVES:	
BENZONATATE	CGY.
CARAMIPHEN EDISYLATE	SK.
CARBETAPENTANE CITRATE	PFZ.
CODEINE	MRK, PEN.
DEXTROMETHORPHAN HYDROBROMIDE	HOF.

SEE FOOTNOTES AT END OF TABLE.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@CENTRAL DEPRESSANTS AND STIMULANTS--CONTINUED	
@OTHER CENTRAL DEPRESSANTS AND STIMULANTS--CONTINUED	
@ANTITUSSIVES--CONTINUED	
ETHYLMORPHINE HYDROCHLORIDE	MRK.
HYDROCODONE BITARTRATE	EN, MAL, MRK, PEN.
NOSCAPINE	MRK.
THEBAINE	MRK.
GENERAL ANESTHETICS:	
KETAMINE HYDROCHLORIDE	PD.
RESPIRATORY AND CEREBRAL STIMULANTS:	
BENZPHETAMINE HYDROCHLORIDE	UPJ.
CAFFEINE, CITRATED	MAL.
CAFFEINE, NATURAL	CPR, GNF.
CAFFEINE, SYNTHETIC	PFZ.
DEANOL ACETAMIDOBENZOATE	RIK.
DIETHYLPROPION HYDROCHLORIDE	BKC, GAN.
NIKETHAMIDE	CGY.
PHENDIMETRAZINE TARTRATE	GAN.
PHENTERMINE	HEX.
@SKELETAL MUSCLE RELAXANTS:	
CARISOPRODOL	BKL.
CYCLOBENZAPRINE HYDROCHLORIDE	MRK.
METHOCARBAMOL	HEX, PEN.
NEFOPAM HYDROCHLORIDE	RIK.
SUCCINYLCHOLINE CHLORIDE	ABB, BUR.
TUBOCURARINE	ABB.
@DERMATOLOGICAL AGENTS (EXCEPT SALICYLIC ACID) AND LOCAL ANESTHETICS:	
DERMATOLOGICAL AGENTS:	
ALLANTOIN	HFT.
ALUMINUM PHENOLSULFONATE	SAL.
AMMONIUM PHENOLSULFONATE	SAL.
AZARIBINE	PD.
BISMUTH SUBGALLATE	MAL, PEN.
GLYCOL SALICYLATE	RDA.
PODOPHYLLUM RESIN	PEN.
SODIUM PHENOLSULFONATE	SAL.
ZINC PHENOLSULFONATE	MAL, SAL.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@DERMATALOGICAL AGENTS (EXCEPT SALICYLIC ACID) AND LOCAL ANESTHETICS--CONTINUED	
LOCAL ANESTHETICS:	
BUTACAINE HYDROCHLORIDE	ABB.
BUTAMBEN PICRATE	ABB.
BUTYL AMINOBENZOATE (BUTAMBEN)	ABB.
COCAINE	MRK.
M-CRESYL ACETATE	ABB.
DIBUCAINE	CGY.
DIBUCAINE HYDROCHLORIDE	CGY.
DYCLONINE HYDROCHLORIDE	BJL.
ETHYL AMINOBENZOATE	LEM, PD.
ISOBUTYL AMINOBENZOATE	RSA.
LIDOCAINE	AST, SDW.
OXETHAZAINE	WYT.
PIPEROCAINE HYDROCHLORIDE	LIL.
PRAMOXINE HYDROCHLORIDE	ABB.
PROCAINE HYDROCHLORIDE	ARA, PFZ.
PROPARACAINE HYDROCHLORIDE	OMS.
TETRACAINE	SDW.
TRIETHANOLAMINE SALICYLATE	RSA.
@EXPECTORANTS AND MUCOLYTIC AGENTS:	
ACETYLCYSTEINE	CDY.
@ETHYLENEDIAMINE DIHYDRIODIDE	HFT, MAL, WAG, WHL.
GLYCERYL GUAIACOLATE (GUAIFENESIN)	GAN, HEX, PEN.
GUAIACOL	PEN.
IODINATED GLYCEROL	X.
POTASSIUM GUAIACOLSULFONATE	HN.
TERPIN HYDRATE	HPC.
@GASTROINTESTINAL AGENTS (EXCEPT METHIONINE AND ITS HYDROXY ANALOGUE) AND THERAPEUTIC NUTRIENTS:	
GASTROINTESTINAL AGENTS (EXCEPT METHIONINE AND ITS HYDROXY ANALOGUE):	
@CHOLINE CHLORIDE (ALL GRADES):	
CHOLINE CHLORIDE (ANIMAL FEED GRADE)	DA, DOW, HFT, IMC, TMH.
CHOLINE CHLORIDE (MEDICINAL GRADE)	HFT.
@OTHER GASTROINTESTINAL AGENTS:	
APOMORPHINE HYDROCHLORIDE	MRK.
BETAINE BASE	HFT.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@GASTROINTESTINAL AGENTS (EXCEPT METHIONINE AND ITS HYDROXY ANALOGUE) AND THERAPEUTIC NUTRIENTS--CONTINUED	
GASTROINTESTINAL AGENTS (EXCEPT METHIONINE AND ITS HYDROXY ANALOGUE--CONTINUED	
@OTHER GASTROINTESTINAL AGENTS--CONTINUED	
BETAINE HYDROCHLORIDE	HPT.
BILE ACIDS, OXIDIZED	SRL, WIL.
BISACODYL	PD.
CHOLINE BICARBONATE	IMC.
CHOLINE BITARTRATE	ACY, HPT.
CHOLINE CITRATE	ACY, HPT.
CHOLINE DIHYDROGEN CITRATE	HPT.
DEHYDROCHOLIC ACID	WIL.
DEXTROTHYROXINE, SODIUM	BAX.
DIHYDROXYALUMINUM AMINOACETATE	CHT.
FLORANTYRONE	SRL.
IRON BILE SALTS	LIL, WIL.
MAGNESIUM CITRATE	MAL.
OX BILE EXTRACT	ABB, WIL.
PECTIN	SKG.
PHENOLPHTHALEIN	SCH.
SITOSTEROLS	LIL, UPJ.
SODIUM DEHYDROCHOLATE	WIL.
SODIUM TARTRATE	MAL.
@THERAPEUTIC NUTRIENTS:	
AMINO ACIDS AND SALTS:	
AMINO ACID MIXTURES	CHT, MDJ.
ASPARTIC ACID	LEM.
GLUTAMIC ACID	LEM.
GLUTAMIC ACID HYDROCHLORIDE	LEM.
POTASSIUM GLUTAMATE	LEM.
OTHER THERAPEUTIC NUTRIENTS:	
COPPER GLUCONATE	PFZ.
FERROUS GLUCONATE	PFZ, SDW.
MAGNESIUM GLUCONATE	PFZ.
MANGANESE GLUCONATE	PFZ.
POTASSIUM GLUCONATE	PFZ.
TOLDIMFOS, SODIUM	RSA.
ZINC GLUCOHEPTONATE	PFN.
ZINC GLUCONATE	PFZ.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@HORMONES AND SYNTHETIC SUBSTITUTES:	
ANABOLIC AGENTS AND ANDROGENS:	
FLUOXYMESTERONE	UPJ.
TESTOSTERONE CYPIONATE	UPJ.
ZERANOL	IMC.
CORTICOSTEROIDS:	
BETAMETHASONE	SCH.
BETAMETHASONE DIPROPIONATE	SCH.
BETAMETHASONE SODIUM PHOSPHATE	SCH.
BETAMETHASONE VALERATE	SCH.
CORTISONE ACETATE	MRK, UPJ.
DEXAMETHASONE	MRK, SCH.
FLUDROCORTISONE ACETATE	UPJ.
FLUOROMETHOLONE	UPJ.
9-ALPHA-FLUOROPREDNISOLONE ACETATE	UPJ.
HALCINONIDE	TRD.
HYDROCORTISONE	MRK, UPJ.
HYDROCORTISONE ACETATE	MRK, UPJ.
MEDRYSONE	UPJ.
METHYLPREDNISOLONE	UPJ.
PREDNISOLONE	MRK, UPJ.
PREDNISOLONE ACETATE	UPJ.
PREDNISONE	UPJ.
TRIAMCINOLONE ACETONIDE	TRD.
TRIAMCINOLONE	TRD, X.
TRIAMCINOLONE DIACETATE	OMS.
ESTROGENS AND PROGESTOGENS:	
ESTROGENS:	
CHLOROTRIANISENE	BJL, BKC.
DIETHYLSTILBESTROL	DLI.
ESTRADIOL CYPIONATE	UPJ.
ESTROGENIC SUBSTANCES, CONJUGATED	ORG.
NATURAL ESTROGENIC SUBSTANCE	ORG.
PROGESTOGENS:	
11 ALPHA-HYDROXYPROGESTERONE	UPJ.
17 ALPHA-HYDROXYPROGESTERONE	UPJ.
MEDROXYPROGESTERONE ACETATE	UPJ.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@HORMONES AND SYNTHETIC SUBSTITUTES--CONTINUED	
ESTROGENS AND PROGESTOGENS--CONTINUED	
PROGESTOGENS--CONTINUED	
MEGESTROL ACETATE	X.
MELENGESTROL ACETATE	UPJ.
NORGESTREL	WYT.
PROGESTERONE	UPJ.
@SYNTHETIC HYPOGLYCEMIC AGENTS:	
ACETOHEXAMIDE	LIL.
CHLORPROPAMIDE	PFZ.
TOLAZAMIDE	UPJ.
TOLBUTAMIDE	UPJ.
@THYROID HORMONE AND ANTITHYROID AGENTS:	
METHIMAZOLE	LIL.
PROPYLTHIOURACIL	ARA.
2-THIOURACIL	ACY.
THYROGLOBULIN	NEP.
OTHER HORMONES AND SYNTHETIC SUBSTITUTES:	
CORTICOTROPIN	ARP, ORG.
EPINEPHRINE BITARTRATE	SDW.
GLUCAGON	LIL.
INSULIN	ARP, LIL.
OXYTOCIN	PD.
@RENAL-ACTING AND EDEMA-REDUCING AGENTS:	
@BENZOTHIADIAZINE DERIVATIVES:	
BENZTHIAZIDE	PFZ.
CHLOROTHIAZIDE	MRK.
HYDROCHLOROTHIAZIDE	ABB, CGY, MRK.
HYDROFLUMETHIAZIDE	X.
METHYCLOTHIAZIDE	ABB.
TRICHLORMETHIAZIDE	SCH.
@THEOBROMINE AND THEOPHYLLINE DERIVATIVES:	
AMINOPHYLLINE	GAN, SRL.
OXTRIPHYLLINE	NEP.
THEOPHYLLINE SODIUM GLYCINATE	CHT.
@OTHER RENAL-ACTING AND EDEMA-REDUCING AGENTS:	
ACETAZOLAMIDE	ACY.
AMILORIDE	MRK.
CHLORTHALIDONE	CGY (E).

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@RENAL-ACTING AND EDEMA-REDUCING AGENTS--CONTINUED	
@OTHER RENAL-ACTING AND EDEMA-REDUCING AGENTS--CONTINUED	
DICHLORPHENAMIDE	MRK.
ETHACRYNIC ACID	MRK.
PROBENECID	GAN, MRK.
TRIAMTERENE	ACY, SK.
@VITAMINS:	
VITAMIN A:	
BETA-CAROTENE (PROVITAMIN A)	HOF.
TRETINOIN (VITAMIN A ACID)	EK, HOF.
VITAMIN A ACETATE (FEED GRADE)	HOF.
VITAMIN A ACETATE (MEDICINAL GRADE)	HOF.
VITAMIN A ALCOHOL	HOF.
VITAMIN A PALMITATE (FEED GRADE)	HOF.
VITAMIN A PALMITATE (MEDICINAL GRADE)	HOF.
@VITAMIN B-COMPLEX:	
NICOTINIC ACID AND DERIVATIVES:	
NIACIN (NICOTINIC ACID) (FEED GRADE)	MRK, NEP, RIL.
NIACIN (NICOTINIC ACID) (MEDICINAL GRADE)	MRK, RIL.
NIACINAMIDE (NICOTINAMIDE)	MRK, NEP, PD, RIL.
PANTOTHENIC ACID AND DERIVATIVES:	
CALCIUM PANTOTHENATE (DEXTRO)	HFT.
CALCIUM PANTOTHENATE (RACEMIC) (FEED GRADE)	HFT.
CALCIUM PANTOTHENATE (RACEMIC) (MEDICINAL GRADE)	HFT.
CALCIUM PANTOTHENATE (RACEMIC) - CALCIUM CHLORIDE COMPLEX (FEED GRADE)	HFT.
CALCIUM PANTOTHENATE (RACEMIC) - CALCIUM CHLORIDE COMPLEX (MEDICINAL GRADE)	DLI.
DEXPANTHENOL	HOF.
PANTHENOL (RACEMIC)	HOF, PD.
SODIUM PANTOTHENATE	PD.
OTHER B-COMPLEX VITAMINS:	
BIOTIN	HOF.
CYANOCOBALAMIN (FEED GRADE)	MRK.
CYANOCOBALAMIN (MEDICINAL GRADE)	MRK.
CYANOCOBALAMIN (USP CRYSTALLINE)	MRK.
INOSITOL	STA.
PYRIDOXINE	HOF.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@VITAMINS--CONTINUED	
@VITAMIN B-COMPLEX--CONTINUED	
OTHER B COMPLEX VITAMINS--CONTINUED	
RIBOFLAVIN (FEED GRADE)	HOF, MRK.
RIBOFLAVIN (MEDICINAL GRADE)	HOF, MRK.
RIBOFLAVIN-5-PHOSPHATE, SODIUM	HOF.
THIAMINE HYDROCHLORIDE	HOF.
THIAMINE MONONITRATE	HOF.
VITAMIN C:	
ASCORBIC ACID	HOF, MRK, PFZ.
CALCIUM ASCORBATE	PFZ.
SODIUM ASCORBATE	HOF, PFZ.
@VITAMIN D:	
CHOLECALCIFEROL (VITAMIN D3)	DA, DLI, TMH, VTM.
@VITAMIN E:	
D-ALPHA TOCOPHEROL	EKT, GNM.
DL-ALPHA TOCOPHEROL	GNM, HOF.
D-ALPHA TOCOPHERYL ACETATE	EKT, GNM.
DL-ALPHA TOCOPHERYL ACETATE (FEED GRADE)	DA, GNM, HOF.
DL-ALPHA TOCOPHERYL ACETATE (MEDICINAL GRADE)	GNM, HOF.
D-ALPHA TOCOPHERYL ACID SUCCINATE	EKT, GNM.
VITAMIN K:	
MENADIONE	ABB.
MENADIONE SODIUM BISULFITE	ABB, HET.
PHYTONADIONE	MRK.
@OTHER MEDICINAL CHEMICALS:	
ANTINEOPLASTIC AGENTS:	
AZATHIOPRINE	BUR.
MERCAPTOPURINE	BUR.
STREPTOZOCIN	PFN.
THIOGUANINE	BUR.
VINBLASTINE SULFATE	LIL.
VINCRISTINE SULFATE	LIL.
DIAGNOSTIC AGENTS:	
ROENTGENOGRAPHIC CONTRAST MEDIA:	
DIATRIZOATE, MEGLUMINE	OMS, SDW.
DIATRIZOATE, SODIUM	OMS, SDW.
IODIPAMIDE, MEGLUMINE	OMS.
IOPANOIC ACID	SDW.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@OTHER MEDICINAL CHEMICALS--CONTINUED	
DIAGNOSTIC AGENTS--CONTINUED	
ROENTGENOGRAPHIC CONTRAST MEDIA--CONTINUED	
IOTHALAMIC ACID	MAL.
IOTHALAMATE, MEGLUMINE	MAL.
IOTHALAMATE, SODIUM	MAL.
TYROPANOATE, SODIUM	SDW.
OTHER DIAGNOSTIC AGENTS:	
BETAZOLE HYDROCHLORIDE (GASTRIC SECRETION INDICATOR)	LIL.
DITHIOTHREITOL (CARDIAC OUTPUT TEST)	CDY.
GLUTAMYL-P-NITROANILINE (LIVER FUNCTION TEST)	CDY.
METYRAPONE	CGY.
SODIUM FLUORESCEIN (CORNEAL TRAUMA INDICATOR)	SDH.
XYLOSE (INTESTINAL MALABSORPTION TEST)	PFN.
METHIONINE AND ITS HYDROXY ANALOGUE:	
METHIONINE, HYDROXY ANALOGUE, CALCIUM SALT	DUP, MON.
SALICYLIC ACID:	
SALICYLIC ACID	DOW, HN.
SMOOTH MUSCLE RELAXANTS:	
ALVERINE	ARA.
ALVERINE CITRATE	ARA.
ALVERINE HYDROCHLORIDE	ARA.
FLAVOXATE HYDROCHLORIDE	SK.
PAPAVERINE HYDROCHLORIDE	LIL.
UNCLASSIFIED MEDICINAL CHEMICALS:	
ALLOPURINOL	BUR.
ETHOXZOLAMIDE (CARBONIC ANHYDRASE INHIBITOR)	ARA.

[1] INCLUDE ANTIFUNGAL AND ANTITUBERCULAR ANTIBIOTICS.
[2] INCLUDE SALES OF ASPIRIN, AND PRODUCTION AND SALES OF SALICYLIC ACID DERIVATIVES (OTHER THAN ASPIRIN).
[3] INCLUDE SALES OF ANTIDEPRESSANTS AND TRANQUILIZERS.

TABLE 3.--MEDICINAL CHEMICALS: DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of medicinal chemicals to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
ABB	Abbott Laboratories
ACY	American Cyanamid Co.
ADC	Anderson Development Co.
ALD	Aldrich Chemical Co.
ARA	Arapahoe Chemicals, Inc. Sub/Syntex Corp., (U.S.A.)
ARN	Arenol Chemical Corp.
ARP	Armour Pharmaceutical Co.
ARS	Arsynco, Inc.
ASH	Ashland Oil, Inc., Ashland Chemical Co.
AST	Astra Pharmaceutical Products, Inc.
ATP	Northern Fine Chemicals, Inc.
BAX	Baxter Laboratories, Inc.
BEE	Beecham, Inc.
BJL	Burdick & Jackson Laboratories, Inc.
BKC	J.T. Baker Chemical Co.
BKL	Kewanee Industries, Inc., Millmaster Chemical Co. Div.
BOC	Biocraft Laboratories, Inc.
BRS	Bristol-Myers Co., Bristol Laboratories Div.
BUR	Burroughs-Wellcome Co.
CDY	Chemical Dynamics Corp.
CGY	Ciba-Geigy Corp. and Ciba Pharmaceutical Co.
CHT	Chattem Drug & Chemical Co., Chattem Chemicals Div.
CPR	Certified Processing Corp.
CWN	Upjohn Co., Fine Chemical Div.
DA	Diamond Shamrock Corp.
DLI	Dawe's Laboratories, Inc.
DOW	Dow Chemical Co.
DUP	E.I. duPont de Nemours & Co., Inc.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
EN	Endo Laboratories, Inc.
FIN	Hexcel Corp., Fine Organics Div.
FLM	Fleming Laboratories, Inc.
GAF	GAF Corp., Chemical Div.
GAN	Gane's Chemical Inc.
GIV	Givaudan Corp.
GNF	General Foods Corp., Maxwell House Div.
GNM	General Mills Chemicals, Inc.
HPC	Hercules, Inc.
HET	Heterochemical Corp.
HEX	Hexagon Laboratories, Inc.
HFT	Syntex Agribusiness, Inc.
HN	Tenneco Chemicals, Inc.
HOF	Hoffmann-LaRoche, Inc.
HYN	Hynson, Westcott & Dunning, Inc.
IMC	IMC Chemical Group, Inc.
JCC	Jefferson Chemical Co., Inc.
KPT	Koppers Co., Inc., Organic Material Div.
KVP	KV Products
LEM	Napp Chemicals, Inc.
LIL	Eli Lilly & Co. and Puerto Rico
LKL	Richardson-Merrell, Inc., Merrell-National Laboratories Div.
MAL	Mallinckrodt Chemical Works
MDJ	Mead Johnson & Co.
MON	Monsanto Co.
MRK	Merck & Co., Inc.
NEP	Nepera Chemical Co., Inc.
NES	Nease Chemical Co., Inc.
NOR	Norwich Pharmacal Co.
NTL	NL Industries, Inc.
OMS	E.R. Squibb & Sons, Inc.
OPC	Orbis Products Corp.
ORG	Organics, Inc.
ORT	Roehr Chemicals, Inc.
PD	Parke, Davis & Co., Sub. of Warner-Lambert Co.
PEN	CPC International, Inc., S.B. Penick Co.
PFN	Pfanstiehl Laboratories, Inc.
PFZ	Pfizer, Inc., and Pfizer Pharmaceuticals, Inc.
PHR	Pharmachem Corp.
RDA	Rhodia, Inc.
RIK	Riker Laboratories, Inc., Sub. of 3M Co.
RIL	Reilly Tar & Chemical Corp.
RLS	Rachelle Laboratories, Inc.
RSA	R.S.A. Corp.
SAL	Salsbury Laboratories
SCH	Schering Corp.
	Sterling Drug Corp.:
SDG	Glenbrook Laboratories Div.
SDH	Hilton-Davis Chemical Co. Div.
SDW	Winthrop Laboratories Div.
SFS	Stauffer Chemical Co., Specialty Div.
SHC	Shell Oil Co., Shell Chemical Co. Div.
SK	Smith & Klein Chemicals
SKG	Sunkist Growers, Inc.
SRL	G.D. Searle & Co.
STA	A.E. Staley Manufacturing Co.
TMH	Thompson-Hayward Chemical Co.
TRD	Manufacturing Enterprises, Inc., Squibb Manufacturing Inc., Trade Enterprises, Inc., Ersana, Inc.
UPJ	Upjohn Co.
VTM	Vitamins, Inc.
WAG	West Agro-Chemicals, Inc.
WHL	Whitmoyer Laboratories, Inc.
WIL	Inolex Corp., Inolex Pharmaceutical Div.
WTL	Pennwalt Corp., Lucidol Div.
WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

FLAVOR AND PERFUME MATERIALS

Anne Klein

Flavor and perfume materials are organic chemicals used to impart flavors and odors to foods, beverages, cosmetics, and soaps. These aromatic 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 1976 amounted to 128.8 million pounds (table 1). Sales of these materials in 1976 amounted to 110.9 million pounds, valued at $195.3 million, compared with 82.7 million pounds, valued at $143.4 million, in 1975. These totals do not include benzyl alcohol, which, before 1973, was included in flavor and perfume materials but is now shown in the miscellaneous cyclic section of this series. U.S. production of flavor and perfume materials in 1976 increased 27.1 percent from the level in 1975 and the quantity of sales increased by 25.5 percent.

Production of cyclic flavor and perfume materials in 1976 amounted to 55.1 million pounds; sales amounted to 48.5 million pounds, valued at $125.5 million. Individual publishable chemicals in the cyclic group produced in the greatest volume in 1976 were terpineols, anethole, benzyl acetate, and benzyl salicylate.

U.S. output of acylic flavor and perfume materials in 1976 amounted to 73.8 million pounds; sales of these materials amounted to 62.4 million pounds, valued at $69.8 million. Monosodium glutamate was by far the most important of the acyclic chemicals in 1976, although the data are not publishable. Other important acyclic compounds included linalyl alcohol, geraniol, citronellol and hydroxycitronellal.

Flavor and Perfume Materials

U.S. production, sales, and consumption

Production in the United States of flavor and perfume chemicals in 1976 amounted to 128.8 million pounds, 27.1 percent higher than the 1975 level but not high enough to completely recoup the 1974-to-1975 decline. Sales by domestic producers increased to 110.9 million pounds in 1976 and thus recovered by more than the 1974-to-1975 decline. The value of sales in 1976 reached $195.3 million.

The benzenoid, other cyclic, and acyclic breakdown of the flavor and aroma chemicals section accommodates tariff classification requirements rather than industry practice. In 1976, acyclic compounds constituted 57 percent of total output, benzenoid cyclic, 31 percent, and other cyclic, 12 percent. Ranked in order of value of sales, the top-ranking single chemicals were monosodium glutamate (MSG), vanillin, saccharin, anethole, coumarin, methyl salicylate, geranial, linalyl alcohol, geraniol, and hydroxycitronella, whose aggregate value of sales amounted to $98.8 million, or 53 percent of the total. The top-ranking single chemicals were monosodium glutamate (sales value not publishable), anethole ($8.1 million), linalyl alcohol ($5.1 million), geraniol ($4.9 million), and hydroxycitronellal ($4.3 million). MSG was the leader in both 1975 and 1976. The value of sales of MSG as well as those of all other top-ranking chemicals increased in 1976 over their 1975 levels.

U.S. apparent consumption of flavor and aroma chemicals as a whole rose by about 19 percent during 1970-76, to a 1976 level of 110 million pounds, valued at $226 million. This rise, however, was interrupted by depressed levels in 1971 and in 1975. MSG consumption in 1976 accounted for a significant share of the total consumption of all flavor and perfume chemicals rose by 32 percent. The following factors suggest that this rise in demand will continue and perhaps accelerate:

(1) There is believed to be increasing public acceptance of substitution of flavor and perfume chemicals for natural oils which are subject to high prices and/or supply problems.

(2) Aroma chemicals are raw materials in products whose sales are expected to grow at accelerating rates. Retail sales of cosmetics and toiletries, according to industry statistics and estimates, grew from $4.7 billion to $7.6 billion between 1970 and 1977 at an annual rate of increase ranging between 5.4 percent and 8.2 percent (the latter in 1977). The industry expects that growth in sales of perfumes, colognes, aftershave, and other fragrance products will be at the rate of 10 percent a year until 1980; sales of cosmetics designed for blacks will grow by 20 percent

annually; and sales of men's fragrances, aftershave lotions, and colognes will increase 10 percent annually. The value of industry shipments of aftershave preparations grew by 62 percent between 1967 and 1972, from \$93 million to \$150.4 million. The value of industry shipments of all toilet preparations rose steadily from \$2.8 billion in 1967 to \$5 billion in 1975. It is estimated that shipments of toilet preparations will reach \$6.2 billion in 1977.

(3) U.S. disposable personal incomes increased by 81.6 percent during the 1970-77 period. Median incomes of all families and of black families grew by 40 percent and 35 percent, respectively, between 1970 and 1975, according to Commerce Department statistics. From 1974 to 1975, median family incomes increased for all families by 6.3 percent and for black families (a recent growing market for cosmetics) by 9.6 percent. This pattern will probably continue through the 1977-80 period. Increased disposable income tends to increase consumption of luxury products such as prepared foods, cosmetics, and toilet preparations--end-use products in which flavor and aroma chemicals are raw materials.

The industry

Although the flavor and aroma chemical industry still largely consists of privately owned companies, it is traditionally international in orientation, and will probably continue to be so, particularly the aroma chemical segment. Of all companies reporting sales of flavor and perfume chemicals to the International Trade Commission for 1976, those companies having affiliates in one to four foreign countries accounted for about 29 percent of total sales value and were represented among the top nine companies ranked by sales values. For aroma chemicals alone, aggregate sales value of companies having foreign affiliates accounted for 36 percent of the total. The foreign affiliates are located in the United Kingdom, France, Switzerland, the Netherlands, Italy, Mexico, and Brazil. During 1976, ninth-ranking Universal Oil Products Fragrances division of UOP, Inc., became a part of Naarden International N.V. of the Netherlands.

The concentration profile of producers of flavor and perfume chemicals has changed, but not dramatically, during the 1970's. In 1971, 4 companies together accounted for 42 percent of total sales value and 19 companies for 72 percent of this total. In 1976, 4 companies together accounted for 49 percent, but only 9 companies accounted for almost 75 percent of total sales value.

In discussing the products and sales of this industry, it must be noted that important products not included here are flavor and perfume oil blends, and synthetic essential oils (worth probably over \$100 million). For reporting companies, the mean total sales of included flavor and aroma chemicals for 1976 was \$4.4 million, the median, \$1.8 million. The number of companies which reported production and/or sales of flavor and perfume chemicals trended downward slightly during 1970-76, from 50 in 1970 to 47 in 1976, having fluctuated in the interim. The increasing use by this industry of sophisticated technology and instrumentation in research and development and production will probably continue to slow entry of smaller scale producers.

Continuation is foreseen in the use of crude sulfate turpentine, a byproduct of kraft paper mills, as a raw material in the production of about half, in terms of sales value, of all flavor and aroma chemicals. Petroleum-based raw materials (e.g., acetylene) are used in the production of the remainder.

Regulation

The flavor and perfume chemicals considered here are widely used in food products or in cosmetics and toiletries. The scope and extent of regulation of these chemicals varies, more when used in foods than in cosmetics, the latter probably being the least regulated of all consumer products. Consumer advocate groups have, however, in recent years catalyzed the trend toward increasing controls and regulation for cosmetics ingredients. Managerial, technical, and legal personnel in the industry are thus focusing increasingly on problems of compliance with Government directives deriving from authority under the Food, Drug, and Cosmetic Act.

In 1970 the Food and Drug Administation (FDA) removed the flavor enhancer monosodium glutamate from baby foods but not from its Generally Regarded As Safe (GRAS) list. Consumption of MSG, which was the largest volume chemical produced and sold in 1976 of any in the flavor and perfume materials group, has, nonetheless, grown during the period 1970-76, and is estimated to reach 56 million pounds for 1977. The sweeteners cyclamates and saccharin fared less well. The FDA, under the Delaney clause, a 1958 admendment to the Food, Drug, and Cosmetic Act which bans food additives found carcinogenic for man or animals, banned cyclamates for use in the United States in 1969 and this past March issued a proposal, albeit postponed, to ban saccharin. Debate on the Delaney clause is current, stimulated largely by the diet food industry, which says that 50 million people in the United States demand its products to control overweight, itself a health hazard. There remain ongoing searches by industry and universities for alternative artificial sweeteners.

Regulations governing perfume and cosmetic ingredients are relatively new. FDA regulations begun in 1976 affecting aroma chemicals as raw materials are involved in the following two labeling requirements for cosmetic products: (1) the listing of ingredients in descending order of prominence, effective for all labels ordered after May 31, 1976, and for all products filled and shipped after November 30, 1976; and (2) the

245-856 O - 77 - 11

obligation of the producer to substantiate the safety of the product inherent in the requirement to designate ingredients on the label whose safety has not been substantiated.

Several years ago the cosmetics industry initiated self-regulation, still ongoing, by asking its member producers, on a voluntary basis, to supply to FDA (1) a register of all manufacturing plants, (2) formula information, and (3) semiannual product experience reports including reported injuries from cosmetic use. During 1976, industry increased self-regulation by sponsoring and financing research panels to carry out a review of the safety of some 2,700 cosmetic and fragrance ingredients. In view of the cosmetic industry's initiatives in these areas, Government regulation will probably not be a retarding factor in research, development, and shipments of perfume and cosmetic ingredients during 1977-80. The labeling requirements for cosmetic products may, however, impede the growth of imports of the ingredients.

International trade

The level of imports of all flavor and aroma chemicals in 1976 reached 28 million pounds, valued at $86 million--35 percent in terms of quantity and 25 percent in terms of value over the 1975 levels. Imports of monosodium glutamate, principally from Korea and Japan, alone amounted to 13.5 million pounds or 48 percent of the total quantity, but their value of $7.2 million constituted only 8 percent of total value. Other important sources of imports were France, Switzerland, and Canada. Important items imported in 1976 other than MSG were saccharin, vanillin, ethyl vanillin, and various artificial musks.

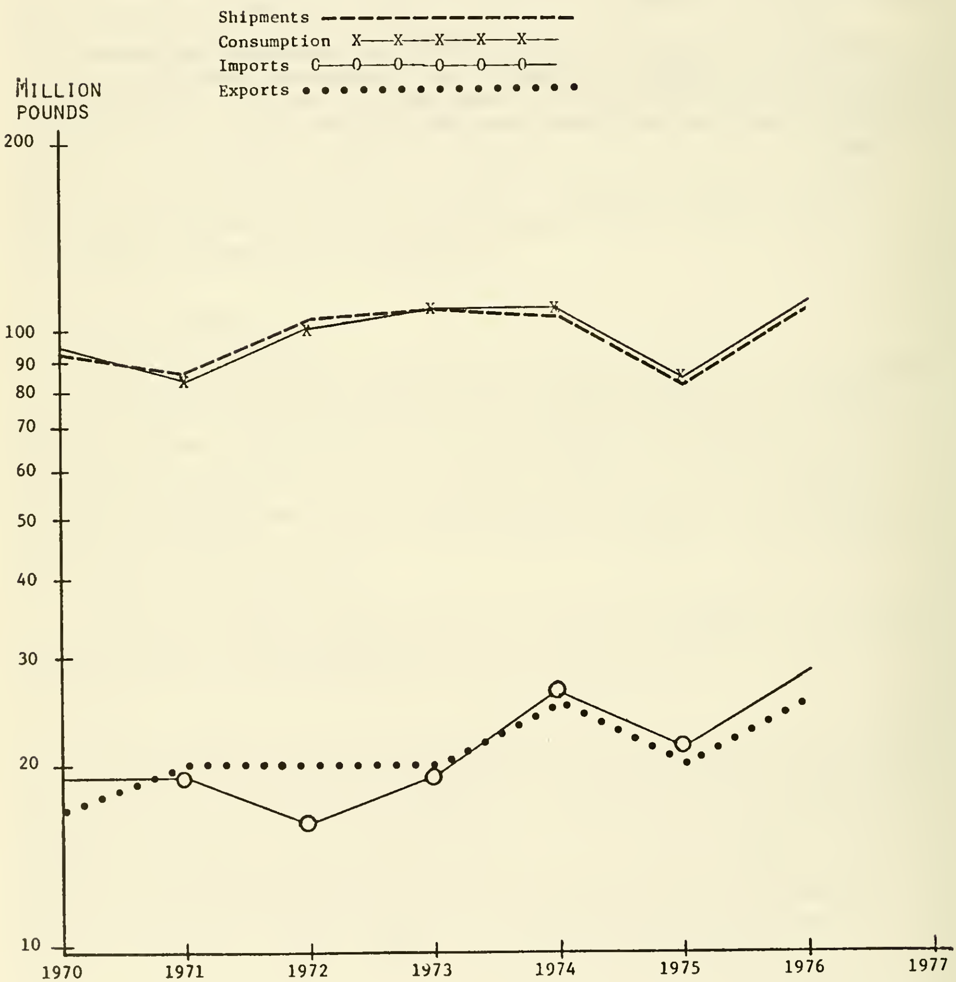
Exports fluctuated during 1970-76, but rose (46 percent) in 1976 in terms of quantity and 25 percent in terms of value from 1975 levels. France and Spain were the principal markets for U.S. exports in 1976, which amounted to 25.3 million pounds valued at $45.6 million.

Imports exceeded exports during 1970-76 except for the period 1971-73. This unfavorable balance of trade in flavor and perfume chemicals broadened in 1976. The ratio of exports to imports was 93.6 percent in 1970 and 98.2 percent in 1974, then it dropped to 95.9 percent in 1975 and to 90.9 percent in 1976. For monosodium glutamate, imports consistently exceeded exports by a large margin during the 1970's. The ratio of exports to imports was 54.6 percent in 1970 but it declined to 30.2 percent in 1976. The multinational orientation of the principal producers of perfume or aroma chemicals will likely lead to a continuation of this unfavorable balance of trade, or trade deficit, during the 1977-80 period.

Monosodium glutamate produced in the United States became less competitive with imports, particularly those from Korea in 1976. The unit values of producers' sales of MSG in 1975 and 1976 were 69 cents and 65 cents per pound, respectively, while those of imports were 59 cents and 53 cents per pound, respectively. Imports, even with duty added, have a price advantage.

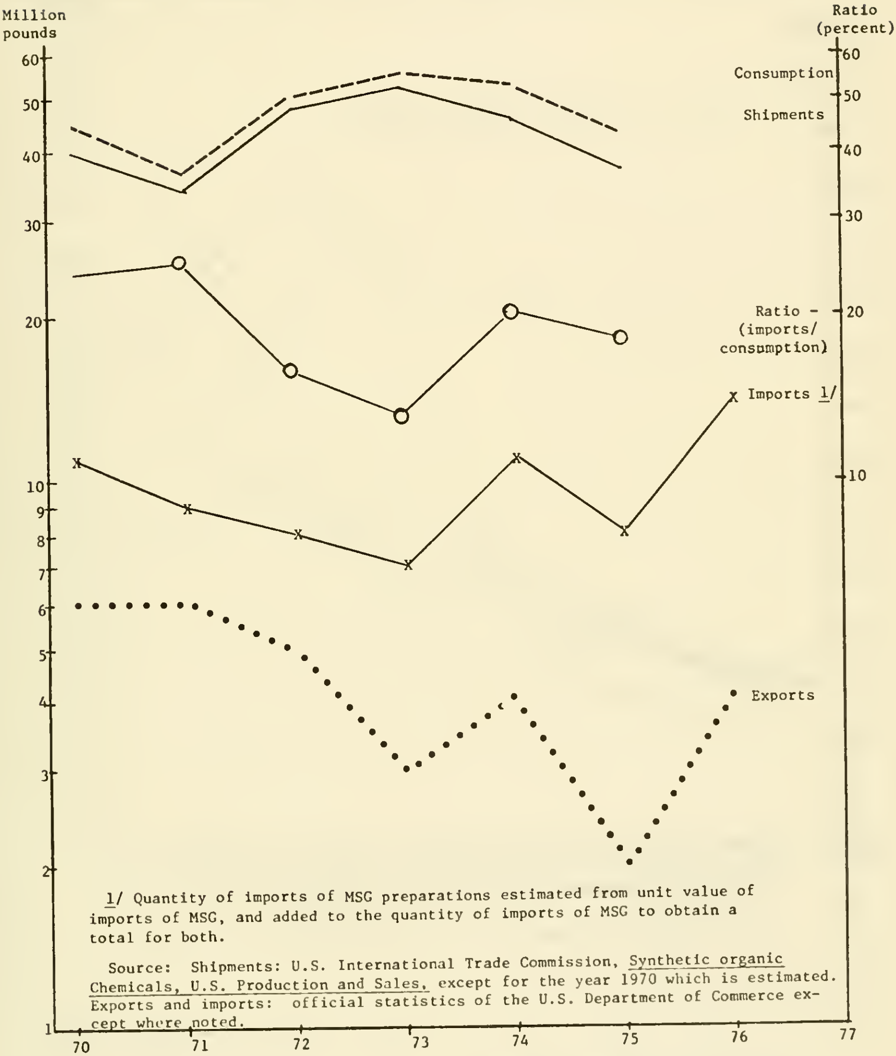
Brazil, the principal U.S. export market for monosodium glutamate, is the site of a new MSG-producing plant which was constructed by a major Japanese producer and became operational in late 1976. U.S. exports of MSG will likely diminish during the 1977-80 period.

FLAVOR AND PERFUME MATERIALS: U.S. SHIPMENTS, FOREIGN TRADE, AND APPARENT CONSUMPTION, 1970-76
(SEMILOGARITHMIC SCALE)



Source: U.S. International Trade Commission, Synthetic Organic Chemicals, U.S. production and Sales and official statistics of the U.S. Department of Commerce.

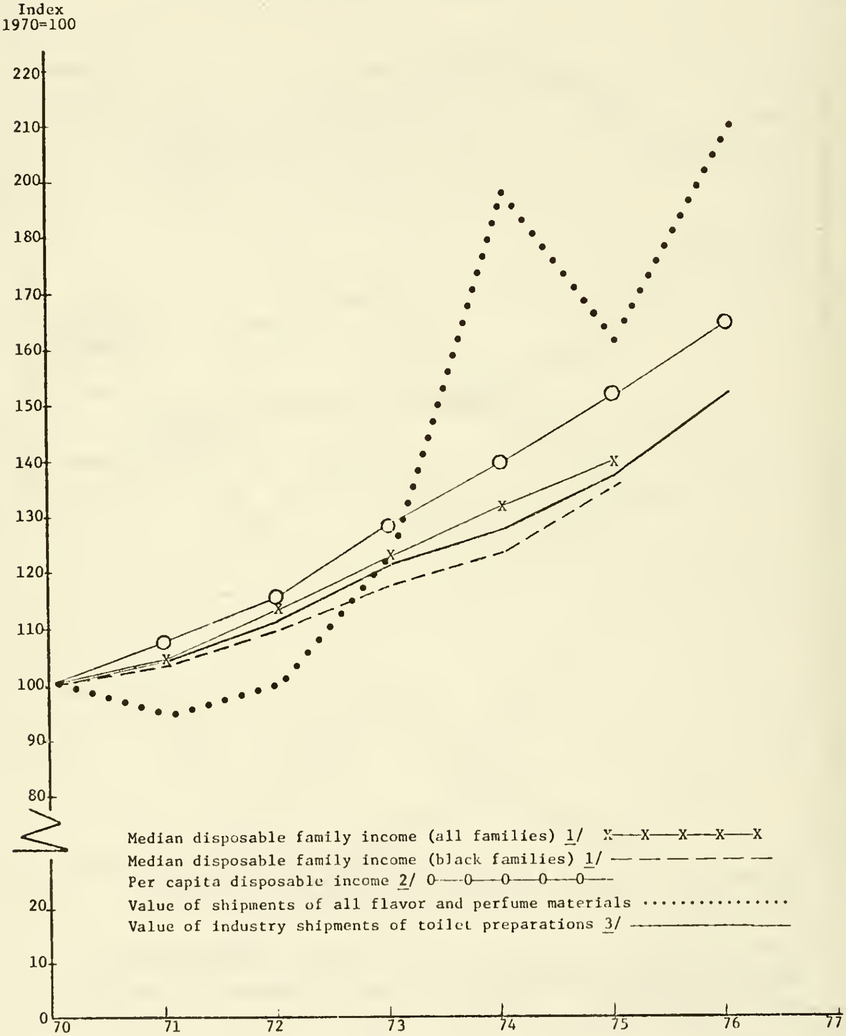
MONOSODIUM GLUTAMATE: U.S. SHIPMENTS, FOREIGN TRADE, APPARENT CONSUMPTION AND RATIO OF IMPORTS TO CONSUMPTION, 1970-76



1/ Quantity of imports of MSG preparations estimated from unit value of imports of MSG, and added to the quantity of imports of MSG to obtain a total for both.

Source: Shipments: U.S. International Trade Commission, Synthetic organic Chemicals, U.S. Production and Sales, except for the year 1970 which is estimated. Exports and imports: official statistics of the U.S. Department of Commerce except where noted.

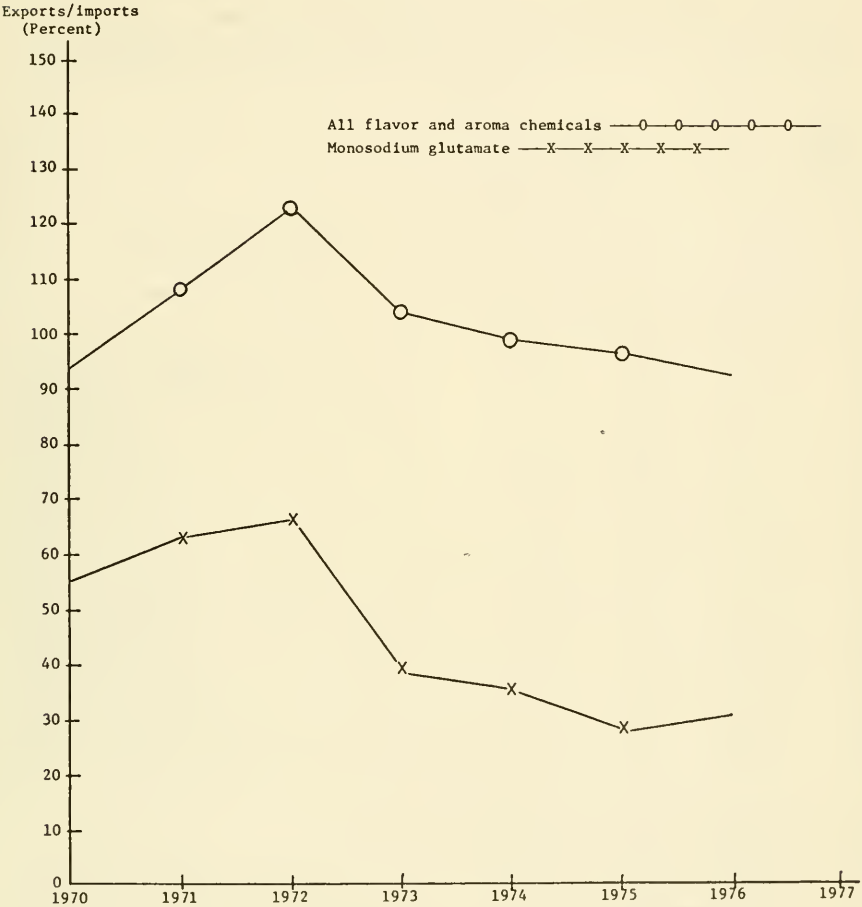
FLAVOR AND PERFUME MATERIALS: VALUE OF U.S. SHIPMENTS OF FLAVOR AND PERFUME MATERIALS AND TOILET PREPARATIONS; MEDIAN DISPOSABLE INCOME OF ALL U.S. FAMILIES AND OF U.S. BLACK FAMILIES; PER CAPITA DISPOSABLE INCOME, 1970-76



1/ Data for 1976 was not available.
2/ Seasonally adjusted at annual rates.
3/ 1976 figures were partly estimated.

Source: Based on official statistics of the Department of Commerce.

FLAVOR AND PERFUME CHEMICALS AND MONOSODIUM GLUTAMATE: U.S. BALANCE OF TRADE AS A RATIO OF EXPORTS TO IMPORTS, 1970-76



Source: Based on official statistics of the U.S. Department of Commerce.

TABLE 1.--FLAVOR AND PERFUME MATERIALS: U.S. PRODUCTION AND SALES, 1976

[Listed below are all synthetic organic flavor and perfume materials for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists separately all flavor and perfume materials for which data on production and/or sales were reported and identifies the manufacturers of each]

MATERIAL	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pound	*1,000 pound*	*1,000 dollars*	*Per pound*
Grand total	128,846	110,948	195,323	$1.76
FLAVOR AND PERFUME MATERIALS, CYCLIC				
Total	55,090	48,503	125,479	2.59
Benzenoid and Naphthalenoid				
Total	40,142	36,776	91,251	2.48
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	...	13	87	6.51
4-Allyl-2-methoxyphenol (Eugenol)	276	222	990	4.45
Anisyl acetate	13	12	81	6.60
Benzophenone[2]	758	453	89B	1.98
Benzyl acetate	1,825	2,174	2,009	.92
Benzyl cinnamate	...	10	62	6.25
Benzyl propionate	27	26	40	1.52
Benzyl salicylate	1,475	1,394	2,350	1.69
Cinnamaldehyde	...	1,104	1,455	1.32
Cinnamyl acetate	19	15	66	4.53
Cinnamyl anthranilate	...	2	15	9.11
Hydrocoumarin	31	37	262	7.13
Isobutyl phenylacetate	31	29	65	2.26
Isobutyl salicylate	...	13	20	1.53
Isopentyl salicylate	941	767	976	1.27
2-Methoxy-4-propenylphenol (Isoeugenol)	158	142	954	6.72
p-Methylanisole	59	43	66	1.53
Methyl anthranilate	283	254	449	1.77
α-Methylcinnamaldehyde	26	10	24	2.35
Methyl phenylacetate	35	24	61	2.60
Phenethyl acetate	...	79	219	2.77
Phenethyl isobutyrate	10	7	32	4.43
2-Phenethyl phenylacetate	30	20	100	5.05
2-Phenoxyethyl isobutyrate	60	48	120	2.50
Phenylacetaldehyde, dimethyl acetal	64	76	345	4.55
4-Phenyl-3-buten-2-one	...	35	74	2.09
3-Phenyl-1-propanol (Hydrocinnamic alcohol)	...	37	124	3.37
p-Propenylanisole (Anethole)	2,105	2,370	8,145	3.44
All other benzenoid and naphthalenoid materials	31,916	27,360	71,162	2.60
Terpenoid, Heterocyclic, and Alicyclic				
Total	14,948	11,727	34,228	2.92
Cedrol	25	35	225	6.28
Cedryl acetate	320	229	973	4.25
Dihydronordicyclopentadienyl propionate (cyclaprop)	26	17	40	2.33
Guaiac wood acetate	39	34	167	4.85
4-Hydroxynonanoic acid, gamma-lactone (γ-nonalactone)	6	13	126	9.97
Ionone (α- and β-)	35	33	228	6.89
Methylionones	637	402	2,463	6.12
Terpineols	2,490	2,704	1,587	.59
α-Terpinylacetate	982	927	921	.99
Vetivenyl acetate	24	13	569	44.19
All other terpenoid, heterocyclic, and alicyclic materials	10,364	7,320	26,929	3.68

See footnotes at end of table.

TABLE 1.--FLAVOR AND PERFUME MATERIALS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

MATERIAL	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
FLAVOR AND PERFUME MATERIALS, ACYCLIC	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Total	73,756	62,445	69,844	$1.12
Allyl hexanoate	38	28	71	2.53
Butyl bytyryl lactate	60	58	228	3.91
Citronellyl acetate	44	29	105	3.59
Citronellyl formate	31	23	96	4.77
Citronellyl isobutyrate	...	4	27	6.24
Citronellyl propionate	5	...	...	...
3,7-Dimethyl-cis-2,6-octadien-1-ol (Nerol)	675	376	210	.56
3,7-Dimethyl-trans-2,6-octadien-1-ol (Geraniol)	1,852	1,905	4,854	2.55
3,7-Dimethyl-cis-2,6-octadien-1-ol acetate (neryl acetate)	19	10	53	5.07
3,7-Dimethyl-1,6-octadien-3-ol (Linalool; Linalyl alcohol)	3,050	2,795	5,089	1.82
3,7-Dimethyl-6-octen-1-al (Citronellal)	723	...	...	...
3,7-Dimethyl-6-octen-1-ol (Citronellol)	1,330	1,125	3,255	2.89
Ethyl butyrate	557	379	362	.95
Ethyl heptanoate	7	9	24	2.59
Ethyl hexanoate (Ethyl caproate)	13	8	18	2.40
Ethyl myristate	22	20	54	2.73
Ethyl nonanoate	...	6	23	3.51
Ethyl octanoate	5	3	12	3.68
Ethyl propionate	149	123	124	1.01
Geranyl acetate	120	98	336	3.43
Geranyl formate	...	15	77	5.22
Geranyl propionate	2	...	...	...
2-Hexanal	4	...	...	...
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxy-citronellal)	840	738	4,304	5.84
Isopentyl butyrate	84	80	97	1.21
Isopentyl formate	8	7	16	2.20
Isopentyl isovalerate	16	...	...	...
Rhodinol	11	...	...	...
All other acyclic materials	64,091	54,606	50,408	.92

[1] Calculated from the unrounded figures.
[2] Includes significant quantities having other end uses.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS' IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AN "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
FLAVOR AND PERFUME MATERIALS, CYCLIC	
BENZENOID AND NAPHTHALENOID	
CYCLIC:	
BENZENOID AND NAPHTHALENOID:	
ACETALDEHYDE, DIPHENETHYL ACETAL *PHENYLETHYL ACETAL*	GIV.
2'-ACETONAPHTHONE *BETA-METHYL NAPHTHYL KETONE*	GIV.
1-ACETOXY-2-SEC-BUTYL-1-ETHNYLCYCLOHEXANE	GIV.
@4-ALLYL-1,2-DIMETHOXYBENZENE	CI, FB, GIV, UOP.
PARA-ALLYLANISOLE	GIV, NCI.
4-ALLYL-1,2-(METHYLENEDIOXY)-BENZENE	FB, GIV.
ALLYL PHENOXYACETATE	GIV.
@4-ALLYL-2-METHOXYPHENOL	CI, GIV, IFF, NEO, PEN(E), UNG, UOP.
4-ALLYL-2-METHOXYPHENOL ACETATE	CI, FB, GIV.
ALPHA-AMYL CINNAMIC ALDEHYDE	IFF.
ORTHO-ANISALDEHYDE *ORTHO-METHOXYBENZALDEHYDE*	FB.
PARA-ANISALDEHYDE	CI, GIV, OPC, UOP.
@ANISYL ACETATE	ELN, GIV, OPC, UOP.
AURANTIUM *HYDROXYCITRONELLYLIDENE METHYL ANTHRANILATE*	FB.
BENZALDEHYDE GLYCERYL ACETAL	GIV.
@BENZOPHENONE	CWN, GAF, NEO, PD, UOP.
@BENZYL ACETATE	FB, GIV, MON, OPC, UOP.
BENZYL BENZOATE	MON, PFZ, UOP, VEL.
BENZYL BUTYRATE	ELN, FB, GIV.
@BENZYL CINNAMATE	FB, GIV, UOP.
BENZYL ETHER	FB, UOP, VEL.
BENZYL FORMATE	GIV, UOP.
BENZYL ISOBUTYRATE	ELN, GIV.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
BENZYL ISOPENTYL ETHER	GIV.
BENZYL ISOVALERATE	ELN, FB.
BENZYL LAURATE	GIV.
1-(BENZYLOXY)-2-METHOXY-4-PROPENYLBENZENE (BENZYL ISOEUGENYL ETHER)	GIV.
BENZYL PHENYLACETATE	ELN, GIV.
@BENZYL PROPIONATE	ELN, FB, GIV.
@BENZYL SALICYLATE	GIV, MON, OPC, UOP.
ALPHA-BROMOSTYRENE *ALPHA-BROMOSTYROL*	CDY, UOP.
PARA-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALEHYDE	GIV, UOP.
TERT-BUTYLDIMETHYL COUMARIN	OPC.
4-TERT-BUTYL-2',6'-DIMETHYL-3',5'-DINITROACETOPHENONE	GIV.
6-TERT-BUTYL-3-METHYL-2,4-DINITROANISOLE (MUSK AMBRETTE)	GIV.
BUTYL PHENYL ACETATE	GIV.
1-TERT-BUTYL-3,4,5-TRIMETHYL-2,6-DINITROBENZENE (MUSK TIBETENE)	GIV.
5-TERT-BUTYL-2,4,6-TRINITRO-META-XYLENE (MUSK XYLOL)	GIV.
CARVACROL	GIV.
@CINNAMALDEHYDE	CI, FB, UOP.
CINNAMIC ALDEHYDE DIMETHYL ACETAL	IFF.
@CINNAMYL ACETATE	ELN, FB, GIV.
CINNAMYL ALCOHOL	FB, GIV, UOP.
@CINNAMYL ANTHRANILATE	FEL, GIV, RT.
CINNAMYL CINNAMATE	FB.
CINNAMYL PROPIONATE	ELN, GIV.
CINNAMYL TIGLATE	FB.
COUMARIN	RDA.
CUMINYL ACETATE	IFF.
CUMINYL ALCOHOL	GIV, IFF.
TRANS-DECAHYDRO-BETA-NAPHTHOL	IFF.
2-4-DIBROMO-6-NITRO-META-CRESYL METHYL ETHER	GIV.
3,4-DIMETHOXY-BENZALDEHYDE *VERATRALDEHYDE*	GIV.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
1,2-DIMETHOXY-4-PROPENYLBENZENE (4-PROPENYLVERATROLE)	PB, GIV, UOP.
3,7-DIMETHYL-2,6-OCTADIENYL PHENYLACETATE (GERANYL PHENYLACETATE)	GIV.
ALPHA,ALPHA-DIMETHYLPHENETHYL ACETATE	IFF.
ALPHA,ALPHA-DIMETHYLPHENETHYL ALCOHCL	IFF.
ALPHA-ALPHA-DIMETHYLPHENETHYL BUTYRATE	IFF.
DIMETHYL PHENYLETHYL CARBINOL	IFF.
DIPHENYLMETHANE	UOP.
1,3-DIPHENYL-2-PROPANONE *DIBENZYLKETONE*	GIV.
PARA-ETHOXYBENZALDEHYDE	GIV.
2-ETHOXYNAPHTHALENE	GIV.
ETHYL ANTHRANILATE	PB.
ETHYL BENZOATE	ELN.
ETHYL CINNAMATE	ELN, GIV.
ETHYL-ALPHA,BETA-EPOXY-BETA-METHYLHYROCINNAMATE	ELN.
2-ETHYL HEXYL SALICYLATE	PEL, MON.
ETHYL PHENYLACETATE	ELN, GIV.
ETHYL PHENYLGLYCIDATE	GIV, UOP.
ETHYL SALICYLATE	PB.
3'-ETHYL-5',6',7',8'-TETRAHYDRO-5',5',8',8',-TETRAMETHYL-2'-ACETONAPHTHONE	GIV, UOP.
GERANYL BENZOATE	GIV.
HEXYL BENZOATE	GIV.
ALPHA-HEXYLCINNAMALDEHYDE	CI, IFF.
HYDRATROPALDEHYDE	GIV, IFF.
HYDRATROPALDEHYDE,DIMETHYL ACETAL	GIV, IFF.
HYDROCINNAMIC ACID	ARS.
@HYDROCOUMARIN	ARS, GIV, UOP.
HYDROXYCITRONELLAL METHYL ANTHRANILATE	GIV.
4-HYDROXY-3-ETHOXYBENZALDEHYDE *ETHYLVANILLIN*	MON, SDH, SLV.
3-HYDROXY-4-METHOXYBENZALDEHYDE *ISO-VANILLIN*	SDH.
4-HYDROXY-3-METHOXYBENZALDEHYDE *VANILLIN*	MON, SLV.
4*4-HYDROXY-3-METHOXYPHENYL*-2-BUTANONE *VANILLYACETONE*	GIV.
PARA-HYDROXY PHENYLBUTANONE	NEO.
INDOLE	GIV.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
ISOAMYL PHENYLACETATE	ELN, FB.
ISOBUTYL BENZOATE	ELN.
@ISOBUTYL PHENYLACETATE	ELN, FB, GIV, OPC.
ISOBUTYLQUINOLINE	IFF.
@ISOBUTYL SALICYLATE	FB, GIV, UOP.
ISOHEXENYL TETRAHYDROBENZALDEHYDE *MYRAC ALDEHYDE*	IFF.
ISOPENTYL BENZOATE	GIV.
@ISOPENTYL SALICYLATE	FB, GIV, MON, UOP.
ISOPROPYLBENZALDEHYDE *CUMALDEHYDE*	GIV.
PARA-ISOPROPYL-ALPHA-METHYLHYDROCINNAMALDEHYDE (CYCLAMEN ALDEHYDE)	GIV, RDA.
LINALYL ANTHRANILATE	FMT.
LINALYL BENZOATE	GIV, HOF.
LINALYL CINNAMATE	HOF.
PARA-MENTHA-1,8-DIENE *LIMONENE*	RT, SKG.
MENTHYL ANTHRANILATE	PFW.
4'-METHOXYACETOPHENONE	GIV, UOP.
3,4-METHOXYBENZALDEHYDE *VERATRALDEHYDE*	SDH.
PARA-METHOXYBENZYL ALCOHOL	GIV, OPC, UOP.
ORTHO-METHOXY CINNAMIC ALDEHYDE	CI, FB.
2-METHOXYNAPHTHALENE	GIV.
1-*PARA-METHOXYPHENYL*-1-PENTEN-3-ONE *ALPHA-METHYL-ANISYLACETONE*	GIV.
@2-METHOXY-4-PROPENYLPHENOL *ISOEUGENOL*	CI, FB, GIV, IFF, NEO, UOP.
2-METHOXY-4-PROPENYLPHENOL,ACETATE	CI, UOP.
4'-METHYLACETOPHENONE	UOP.
@PARA-METHYLANISOLE	GIV, OPC, SW, UOP.
@METHYL ANTHRANILATE	FB, SW, UNG.
METHYL BENZOATE	HN.
ALPHA-METHYLBENZYL ACETATE	CI, FB, GIV.
@ALPHA-METHYLCINNAMALDEHYDE	CI, FB, GIV.
6-METHYLCOUMARIN	GIV.
1,2-(METHYLENEDIOXY)-4-PROPENYLBENZENE (ISOSAFEROLE)	GIV.
4-METHYL-7-ETHOXYCOUMARIN	GIV.
PARA-METHYLHYDRATROPALDEHYDE	GIV.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
1-METHYL-ISOHEXYL-HEXAHYDRO BENZALDEHYDE	GIV.
METHYL N-METHYLANTHRANILATE	GIV, SW.
@METHYL PHENYLACETATE	ELN, GIV, OPC, SFA.
PARA-METHYL PHENYLETHYL ALCOHOL	NEO.
METHYL SALICYLATE	DOW, HN, MON.
METHYL CINNAMATE	FB, UOP.
MUSK 89	IFF.
1,1,3,3,5-PENTAMETHYL-4,6-DINITROINDAN *MOSKENE*	GIV.
ALPHA-PENTYLCINNAMALDEHYDE	CI, FB, UOP.
@PHENETHYL ACETATE	GIV, IFF, OPC.
PHENETHYL ALCOHOL	IFF, NEO.
PHENETHYL BENZOATE	OPC.
PHENETHYL FORMATE	ELN, IFF.
@PHENETHYL ISOBUTYRATE	ELN, GIV, IFF.
PHENETHYL ISOVALERATE	ELN, FB, GIV, RT.
PHENETHYL METHACRYLATE	NEO.
@2-PHENETHYL PHENYLACETATE	CI, ELN, GIV, IFF, NEO.
PHENETHYL PROPIONATE	ELN, GIV, IFF.
PHENETHYL SALICYLATE	GIV, NEO.
@2-PHENOXYETHYL ISOBUTYRATE	ELN, FB, GIV, IFF, OPC.
PHENOXYETHYL PROPIONATE	IFF.
PHENYLACETALDEHYDE	GIV.
@PHENYLACETALDEHYDE,DIMETHYL ACETAL	ELN, GIV, UOP.
PHENYLACETIC ACID	GIV.
PHENYLACETIC ACID ISOPENTYL ESTER	GIV.
ALPHA-PHENYLANISOLE	GIV.
ORTHO-PHENYLANISOLE *2-METHOXYBIPHENYL*	OPC.
ORTHO-PHENYLPHENOL *COSMETIC GRADE*	RSA.
@4-PHENYL-3-BUTEN-2-ONE	FB, NEO, UOP.
PHENYLETHYL TIGLATE	FB.
@3-PHENYL-1-PROPANOL	ELN, FB, GIV, UOP.
3-PHENYLPROPYL ACETATE	ELN, FB, GIV.
3-PHENYLPROPYL CINNAMATE	FB, RT.
PIPERONAL	AMB, GIV.
@PARA-PROPENYLANISOLE	ARZ, FB, GLD, HPC, NCI.
4-PROPENYL-1,2-DIMETHOXYBENZENE *METHYL ISOEUGENOL*	CI.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
PARA-PROPYLANISOL	FB, GIV.
N-PROPYL PHENYL ETHYL ALCOHOL	GIV.
SWEETENERS, SYNTHETIC:	
CYCLOHEXANESULFAMIC ACID	ABB.
CYCLOHEXANESULFAMIC ACID, CALCIUM SALT	ABB.
CYCLOHEXANESULFAMIC ACID, SODIUM SALT	ABB.
SACCHARIN (1,2-BENZISOTHIAZOLIN-3-ONE,-1,1-DIOXIDE)	SW.
SACCHARIN, SODIUM SALT	SW.
PARA-TOLUALDEHYDE	FB, GIV.
PARA-TOLYLACETALDEHYDE	GIV.
PARA-TOLYL ACETATE	ELN, GIV.
PARA-TOLYL ISOBUTYRATE	GIV.
PARA-TOLYLPHENYLACETATE	GIV.
ALPHA-(TRICHLOROMETHYL) BENZYL ACETATE	NEO.
ALL OTHER BENZENOID OR NAPHTHALENOID CHEMICALS	IFF, PFW, RDA, SLV.
TERPENOID, HETEROCYCLIC, AND ALICYCLIC:	
ACETYL BUTYRYL *2,3-HEXANEDIONE*	FB.
ACETYL ISOVALERYL *5-METHYL-2,3-HEXANEDIENE*	FB.
ACETYL PROPIONYL *2,3-PENTANED&ONE*	FB.
ACONITIC ESTER	GIV.
ALLO-OCIMENE *MUGUOL*	IFF, NCI.
ALLYL CYCLOHEXYL P-OPIONATE	GIV.
AMYRIS ACETATE	GIV.
BORNYL ISOVALERATE	FB.
2-SEC-BUTYLCYCLOHEXANONE	GIV.
PARA-TERT-BUTYLCYCLOHEXANONE *ORIVONE*	IFF.
2-TERT-BUTYL CYCLOHEXENYL ACETATE *VERDOX*	IFF.
PARA-TERT-BUTYLCLOHEXYL ACETATE	CI, IFF.
CADINENE	FB.
BETA-CARYOPHYLLENE	CI, GIV.
CARYOPHYLLENE ACETATE	CI.
CARYOPHYLLENE PHENOL FREE	FB.
CEDARWOOD ACETATE	FB.
CEDRENE	NEO.
ALPHA-CEDRENE EPOXIDE *ANDRANE*	IFF.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
TERPENOID, HETEROCYCLIC, AND ALICYCLIC--CONTINUED	
CEDRENOL	GIV, IFF, NEO.
@CEDROL	ELN, GIV, IFF, NEO.
@CEDRYL ACETATE	ELN, GIV, IFF, NEO, UNG.
CEDRYL FORMATE	IFF.
CYCLOHEXYL CYCLOHEXANOL	CI.
2-CYCLOHEXYLCYCLOHEXANONE	GIV.
DIHYDRONORDICYCLOPENTADIENYL ACETATE	CI, GIV, IFF, OPC.
@DIHYDRONORDICYCLOPENTADIENYL PROPIONATE (CYCLAPROP)	CI, GIV, OPC, PFW.
DIHYDRO TERPINEOL	NCI.
DIHYDROTERPINYL ACETATE	GIV, NCI, OPC.
3,5-DIMETHYL CYCLOHEXENE ALDEHYDE	PFW.
ETHYLENE BRASSYLATE	NEO.
ETHYL FUROATE	RT.
FURFURAL ACETONE	RT.
FURFURAL ACROLEIN	RT.
GALAXOLIDE*HEXAMETHYL CYCLOPENTA-GAMMA-2-BENZOPYRAN*	IFF.
@GUAIACWOOD ACETATE	ELN, FB, GIV, NEO.
GUAIENE	FB.
3-HYDROXY-2-ETHYL-4-PRYRONE	PFZ.
@4-*4-HYDROXY-4-METHYLPENTYL*-3-CYCLOHEXENE-10-CARBOXALDEHYDE*LYRAL*	IFF.
3-HYDROXY-2-METHYL-4-PYRONE	PFZ.
4-HYDROXYNONANIC ACID, GAMMA-LACTONE (GAMMA-NONALACTONE)	CI, GIV, UOP.
4-HYDROXYOCTANOIC ACID,GAMMA-LACTONE (GAMMA-OCTALACTONE)	GIV, RT.
4-HYDROXYUNDECANOIC ACID,GAMMA-LACTONE (GAMMA-UNDECALACTONE)	FE, UOP.
4-HYDROXYVALERIC ACID, GAMMA-LACTONE *GAMMA-VALEROLACTONE*	GIV.
BETA-IONONE	HOF, STP.
ALPHA-IONONE	GIV, STP.
@IONONE(ALPHA- AND BETA-)	GIV, HOF, IFF, STP.
ISOBORNYL ACETATE	NCI, RDA.
ISOBORNYL PROPIONATE	ELN, GIV.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
TERPENOID, HETEROCYCLIC, AND ALICYCLIC--CONTINUED	
ISOCAMPHYL CYCLOHEXANOLS	GIV.
ISOHEXENYL CYCLOHEXENYL CARBOXALDEHYDE	OPC.
ISOJASMONE	FB.
ISOMENTHONE	GIV.
2-ISOPROPYLCYCLOHEXANOL	CI, GIV.
JASMAL	IFF.
LAVANDIN,ACETYLATED	GIV, UNG.
PARA-MENTHA-1,4-DIENE	GLD.
PARA-MENTHA-6,8-DIEN-2-OL	FB, NEO.
PARA-MENTHA-6,8-DIEN-2-ONE *CARVONE; CARVOL*	FB, NEO.
L-PARA-MENTHA-6,8-DIEN-2-YL ACETATE *L-CARVYL ACETATE*	FB.
PARA-MENTHAN-3-ONE	GIV, GLD.
PARA-MENTH-8-EN-3-OL	GIV.
PARA-MENTH-1-EN-3-ONE *PIPERITONE*	GIV.
PARA-MENTH-4-(8)-EN-3-ONE	GIV.
1-1-PARA-MENTHEN-6-YL-1-PROPANONE	GIV.
MENTHOL,SYNTHETIC,TECH.	GIV.
MENTHOL, SNTHETIC, U.S.P.	GLD.
MENTHYL ACETATE	FB, GIV, PFW.
@METHYLIONONES:	
6-METHYL-ALPHA-IONONE	GIV.
6-METHYL-BETA-IONONE	UNG.
METHYLIONONE(ALPHA- AND BETA-)	GIV, IFF, NEO, RDA, STP.
GAMMA-METHYLIONONE	GIV, NEO.
NOPOL	NCI, OPC.
NOPYL ACETATE	FB, FEL, NCI, OPC, RT.
3-PENTYL TETRAHYDRO-4 PYRIDINE* JESSEMAL	IFF.
PINENE	NCI.
ALPHA-SANTALOL	GIV, IFF.
ALPHA-SANTALYL ACETATE	GIV.
SASSAFRASS OIL,HYDROGENATED	GIV.
@TERPINEOLS:	
ALPHA-TERPINEOL	GLD, HPC, NCI.
TERPINEOL(ALPHA- AND BETA-)	GIV.
ALPHA-TERPINYL ACETATE	GIV, NCI, NEO, PFW, RDA, UNG.
ALPHA-TERPINYL PROPIONATE	ELN, GIV.
3,3,5 TRIMETHYL CYCLOHEXANOL *META-HOMOMENTHOL*	ARS, NEO.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
TERPENOID, HETEROCYCLIC, AND ALICYCLIC--CONTINUED	
1-(2,6,6-TRIMETHYL-2-CYCLOHEXEN-1-YL)-1,6-HEPTADIEN-3-ONE	IFF.
2,6,10-TRIMETHYL-9-UNDECEN-1-AL	GIV.
VETIVENOL	GIV, UOP.
@VETIVENYL ACETATE	ELN, PB, GIV, IFF, NEO, UNG, UOP.
ALL OTHER TERPENOID,HETEROCYCLIC,OR ALICYCLIC FLAVOR AND PERFUME CHEMICALS	PFW.
ACYCLIC:	
ALLYL DISULFIDE	RT.
ALLYL HEPTANOATE	ELN, PB, RT.
@ALLYL HEXANOATE	ELN, PB, GIV, PFW.
ALLYL ISOTHIOCYANATE	OPC.
ALLYL ISOVALERATE	RT.
ALLYL OCTANOATE	RT.
ALLYL SULFIDE	RT.
AMYL PROPIONATE	GIV.
AMYL VINYL CARBINOL	NEO.
BRAZINOL *DIMETHYL HEPTENOL*	RDA.
BUTTER ACIDS	RT.
BUTTER ESTERS	RT.
@BUTYL BUTYRL LACTATE	ARS, BJL, ELN, RT.
BUTYL UNDECYLENATE	CI, GIV.
CITRAL A AND B,MIXTU-E	NCI.
CITRAL DIMETHYL ACETAL	CI, GIV, IFF, RDA.
CITRONELLYL ACETATE	ELN, GIV, IFF.
CITRONELLYL BUTYRATE	ELN, GIV.
@CITRONELLYL FORMATE	ELN, GIV, IFF, NEO.
@CITRONELLYL ISOBUTYRATE	ELN, GIV, IFF.
CITRONELLYL OXYACETALDEHYDE	IFF, OPC.
@CITRONELLYL PROPIONATE	ELN, GIV, IFF.
DECANAL	CI, GIV.
DECYL ACETATE	GIV.
DIETHYL ACETAL	PB.
DIETHYL SEBACATE	ELN, UOP.
DIETHYL SUCCINATE	ELN, IFF, UCC(E).
3,7-DIMETHYL-3-ACETOXY-OCTENE-6-YNE-1	RDA.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
2,6 DIMETHYL-5-HEPTEN-1-AL	GIV.
DIMETHYL HEXANEDIOL	X(E).
DIMETHYL HEXYNEDIOL	X(E).
3,7-DIMETHYL-2,3,6-NONADIENENITRILE	GIV.
3,7-DIMETHYL-TRANS-2,6-OCTADIENAL (CITRAL A;GERANIAL)	FB, FEL, GIV, GLD, RDA, UOP.
@3,7-DIMETHYL-CIS-2,6-OCTADIEN-1-OL	ELN, FB, GIV, GLD, IFF, NCI.
@3,7-DIMETHYL-CIS-2,6-OCTADIEN-1-OL,ACETATE *NERYL ACETATE*	ELN, GIV, IFF.
@3,7-DIMETHYL-1,6-OCTADIEN-3-OL (LINALOOL) (LINALYL ALCOHOL)	ELN, FB, FEL, GIV, GLD, HOF, NCI, RDA.
@3,7-DIMETHYL-TRANS-2,6-OCTADIEN-1-OL	CI, ELN, FB, FEL, GIV, GLD, IFF, NCI, UOP.
3,7-DIMETHYL-1,6-OCTADIEN-3-OL,ACETATE (LINALYL ACETATE)	ELN, FB, GIV, HOF, NCI, RDA.
3,7-DIMETHYL-1,6-OCTADIEN-3-YL ISOBUTYRATE (LINALYL ISOBUTYRATE)	ELN, HOF.
3,7-DIMETHYL-1,6-OCTADIEN-3-YL PROPIONATE (LINALYL PROPIONATE)	ELN, GIV, HOF.
3,7-DIMETHYLOCTANOL-1 *TETRAHYDOGERANIOL*	GIV.
3,7-DIMETHYL-3-OCTANOL	IFF.
DIMETHYLOCTANYL ACETATE	IFF.
@3,7-DIMETHYL-6-OCTEN-1-AL	CI, FB, GIV, GLD, RDA, UOP.
2,6-DIMETHYL,2-OCTENE-7-YNE-6-OL	RDA.
@3,7-DIMETHYL-6-OCTEN-1-OL	CI, ELN, FB, GIV, GLD, IFF, NCI.
3,7-DIMETHYL-7-OCTENOL 70PCT,6-OCTENOL ISOMER 30PCT	GIV.
DIMYRCETOL	IFF.
@ETHYL BUTYRATE	FB, NW, UOP.
ETHYL CAPRATE	ELN, FB.
ETHYL FORMATE	FB.
@ETHYL HEPTANOATE	ELN, FEL, RT, UOP.
@ETHYL HEXANOATE	ELN, FB, NW, PFW, RT.
ETHYL ISOBUTYRATE	FB.
ETHYL ISOVALERATE	ELN, FB, PFW.
ETHYL LAURATE	ELN, FB.
ETHYL LINALOOL *3,7-DIMETHYL-1-6-NONADIEN-3-OL*	HOF.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
ETHYL LINALYL ACETATE*3,7-DIMETHYL-1,6-NONADIEN-OL ACETATE	HOF.
ETHYL-2-METHYL BUTYRATE	GLD, PFW.
ETHYL-2-METHYL-2-PENTENOATE	PFW.
ETHYL MYRISTATE	ELN, PFW, RT.
@ETHYL NONANOATE	ELN, FB, GIV.
@ETHYL OCTANOATE	ELN, FB, RT.
ETHYL OXYHYDRATE	FLO, RT.
@ETHYL PROPIONATE	FB, NW, UOP.
ETHYL VALERATE	ELN.
GERANIC ACID	FB.
GERANYL NITRILE *GERANO NITRILE* *CITRALVA*	IFF.
@GERANYL ACETATE	CI, ELN, FB, FEL, GIV, IFF.
GERANYL BUTYRATE	ELN, GIV.
GERANYL CROTONATE	FB.
GERANYL DIMETHYL ACRYLATE	FMT.
@GERANYL FORMATE	CI, ELN, GIV.
GERANYL ISOBUTYRATE	IFF.
GERANYL ISOVALERATE	FB.
GERANYL NERYL FORMATE *NERGER FORMATE*	IFF.
GERANYL NITRILE	CI.
@GERANYL PROPIONATE	ELN, FB, IFF.
GERANYL TIGLATE	FB.
GLUTAMIC ACID,MONOSODIUM SALT	GRW, IMC, SFF.
N-HEPTANAL	NTL.
HEPTANOLIDE-*4,1* *GAMMA-HEPTALACTONE*	FB.
2,4-HEXADIENEAL	PFW.
HEXADIENEOL	PFW.
@2-HEXENAL	FB, GIV, PFW.
CIS-3-HEXENAL-2-METHYL	GLD.
2-HEXENOL	FB.
CIS-3-HEXEN-1-OL	GIV, SW.
CIS-3-HEXEN-1-YL ACETATE	GIV.
HEXOXYACETALDEHYDE DIMETHYL ACETAL	FB.
HEXYL CAPROATE	FB.
3-HEXYNOL	HOF, SW.
3-HYDROXY-2-BUTANONE	FMT.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
@7-HYDROXY-3,7-DIMETHYL-1-OCTANAL (HYDROXYCITRONELLAL)	CI, GIV, GLD, IFF, RDA, UOP.
7-HYDROXY-3,7-DIMETHYL OCTANAL,DIMETHYL ACETAL (HYDROXYCITRONELLAL,DIMETHYL ACETAL)	GIV, UOP.
HYDROXY-2-PROPANONE *ACETOL*	FB.
ISOAMYL CAPROATE	FB.
ISOAMYL GERANATE	FB.
ISOAMYL PROPIONATE	FB.
ISOBUTYL ACETATE	FB.
ISOBUTYL BUTYRATE	FB.
ISODIHYDRO LAVANDULOL	FB.
ISODIHYDRO LAVANDULYLACETATE	FB.
ISODIHYDRO LAVANDULYLALDEHYDE	FB.
ISONONYL ACETATE	CI.
ISOPENTYL ACETATE *ISOAMYL ACETATE*	FB, NW, PFW.
@ISOPENTYL BUTYRATE	FB, GIV, NW, PFW, UOP.
@ISOPENTYL FORMATE	ELN, FB, GIV, RT.
@ISOPENTYL ISOVALERATE	ELN, FB, PFW, RT.
LAURALDEHYDE	GIV.
LINALALOOL OXIDE	HOF.
LINALYL FORMATE	HOF.
LINALYL,NERYL,GERANYL ACETATES,MIXTURE	NCI.
METHOXY CITRONELLAL	GLD.
METHYL BUTENOL	X(E).
METHYL BUTYNOL	X(E).
ALPHA-METHYL BUTRIC ACID	PFW.
METHYL HEPTADIENONE	HOF.
3-METHYL-5-HEPTANONE OXIME	GIV.
METHYL HEPTENONE	HOF, RDA.
METHYL ISOBUTYRATE	PFW.
METHYL ISOVALERATE	FB.
METHYL-2-METHYL BUTYRATE	GLD.
METHYL-2-NONENOATE	GIV, PFW.
METHYLOL METHYL HEXYL KETONE	GIV.
3-METHYL-2-*AND3*NONENE NITRILE	GIV.
METHYL PENTADIENE	FB.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-METHYL PENTANOIC ACID	PFW.
METHYL PENTYLNOL	X(E).
METHYL PROPIONATE	FB.
BETA METHYL THIOPROPIONALDEHYDE	RT.
2-METHYLUNDECANAL	GIV.
MYRCENYL ACETATE	IFF.
MYRISTALDEHYDE	GIV.
NEROLIDOL *3,7,11,TRIMETHYL-1,6,10 DODECTRIENE-3-OL*	HOF.
NONANAL	GIV.
1,3-NONANEDIOL ACETATE	CI, GIV.
NONANOL	GIV.
NONYL ACETATE	ELN, GIV.
OCIMENYL ACETATE	IFF.
OCTANAL	CI, GIV.
3-OCTANOL	GIV.
3-OCTANONE	GIV.
N-OCTYL ACETATE	ELN, GIV.
N-OCTYL ALCOHOL	GIV.
OCTYL ISOVALERATE	RT.
PENTYL ACETATE	UOP.
N-PROPYL ACETAL	GIV.
NORMAL-PROPYL NORMAL-BUTYRETE	PFW.
PSEUDO LINALYL ACETATE *NEOBERGAMATE*	IFF.
@RHODINOL	FB, FEL, GIV, IFF.
RHODINYL ACETATE	GIV, IFF.
TEPYL ACETATE	ELN, UOP.
TETRAHYDRO ALLO-OCIMENE	IFF.
TETRAHYDRO PSEUDOIONONE	CI.
3,5,5-TRIMETHYL HEXANAL	NEO.
UNDECANAL	GIV.
9-UNDECENAL	GIV.
10-UNDECEN-1-YL ACETATE	GIV.
ALL OTHER ACYCLIC FLAVOR AND PERFUME MATERIALS	PFW, RSA.

TABLE 3.--FLAVOR AND PERFUME MATERIALS: DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of flavor and perfume materials to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of Company	Code	Name of Company
ABB	Abbott Laboratories	NCI	Union Camp Corp.
AIP	Air Products & Chemicals, Inc.	NEO	Norda Inc.
AMB	American Bio-Synthetics Corp.	NTL	NL Industries, Inc.
ARS	Arsynco, Inc.	NW	Northwestern Chemical Co.
ARZ	Arizona Chemical Co.		
		OPC	Orbis Products Corp.
BJL	Burdick & Jackson Labs., Inc.	OTC	Story Chemical Corp.
CI	Chem-Fleur, Inc.	PD	Parke, Davis & Co. Sub of Warner-Lambert Co.
CWN	Upjohn Co., Fine Chemical Div.		
		PEN	CPC International, Inc., Penick Div.
DOW	Dow Chemical Co.	PFW	Polak's Frutal Works, Inc.
		PFZ	Pfizer, Inc.
ELN	Elan Chemical Co.		
		RDA	Rhodia, Inc.
FB	Fritzsche, Dodge & Olcott, Inc.	RSA	R.S.A. Corp.
FEL	Felton International, Inc.	RT	Ritter International
FLO	Florasynth, Inc.		
FMT	Fairmount Chemical Co., Inc.	SDH	Sterling Drug, Inc., Hilton-Davis Chemical Co. Div.
GAF	GAF Corp., Chemical Div.		Stauffer Chemical Co.:
GIV	Givaudan Corp.	SFF	Food Ingredients Div.
GLD	SCM Corp., Glidden-Durkee Div.	SFS	Specialty Div.
GRW	Great Western Sugar Co.	SKG	Sunkist Growers, Inc.
		SLV	Sterwin Chemicals, Inc.
HN	Tenneco Chemicals, Inc.	STP	Stepan Chemical Co.
HOF	Hoffmann-LaRoche, Inc.	SW	Sherwin-Williams Co.
HPC	Hercules, Inc.		
		UCC	Union Carbide Corp.
IFF	International Flavors & Fragrances, Inc.	UNG	Ungerer & Co.
IMC	IMC Chemical Group, Inc.	UOP	UOP, Inc., UOP Chemical Div.
MON	Monsanto Co.	VEL	Velsicol Chemical Corp.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

PLASTICS AND RESIN MATERIALS

Anne Klein

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. Depending on the chemical composition, manufacturing process or intended use, the commercial products may contain plasticizers, fillers, extenders, stabilizers, coloring agents, or other additives. Plastics materials may be molded, cast, or extruded into semi-finished 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 1976 are given in table 1. U.S. production of plastics and resin materials in 1976 totaled 29,680 million pounds, or 21 percent more than the 24,509 million pounds produced in 1975. Sales in 1976 totaled 24,837 million pounds, valued at $8,619 million compared with 20,955 million pounds, valued at $7,003 million in 1975.

Thermosetting materials are those which harden with a change in composition in the final treatment so that they cannot again be softened by heat or solvents. U.S. production of thermosetting materials totaled 5,970 million pounds in 1976 compared with 5,140 million pounds in 1975. Production of the most important products in 1976 included polyether and polyester polyols for urethanes (1,346 million pounds), phenolic resins (1,305 million pounds), amino (or urea and melamine) resins (1,230 million pounds), polyester resins, (unsaturated) (865 million pounds) and alkyd resins (705 million pounds).

Thermoplastic materials are those which can be repeatedly softened by heat and shaped. U.S. production of thermoplastic materials totaled 23,710 million pounds in 1976 compared with 19,728 million pounds in 1975. Production of the most important products in 1976 included polyethylene (8,775 million pounds), vinyl resins (5,553 million pounds), and styrene type materials (4,743 million pounds).

TABLE 1.--PLASTICS AND RESIN MATERIALS: U.S. PRODUCTION AND SALES, 1976

[Quantities and values are given in terms of the total weight of the materials (dry basis). Listed below are all plastics and resin materials, urethane type elastomers, and certain precursors for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published and/or where no data were reported.) Table 2 lists all products for which data on production and/or sales were reported and identifies the manufacturers of each]

MATERIAL	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds dry basis[2]	*1,000 pounds dry basis*[2]	*1,000 dollars*	*Per pound*
Grand total	29,680,253	24,836,847	8,619,353	$0.35
Plastics and resin materials, benzenoid[3]	8,943,083	7,684,865	3,113,430	.41
Plastics and resin materials, nonbenzenoid	20,737,170	17,151,982	5,505,923	.32
THERMOSETTING RESINS				
Total	5,969,844	4,680,620	1,878,462	.40
Alkyd resins, total[4]	704,647	470,715	201,637	.43
Phthalic anhydride type	626,575	433,249	181,207	.42
Polybasic acid type	40,696	23,681	13,519	.57
Styrenated-alkyds or copolymer alkyds	34,502	12,108	5,876	.49
Other copolymer alkyds	2,874	1,677	1,035	.62
Dicyandiamide resins	1,950	1,815	1,699	.94
Epoxy resins:[5,6]				
Unmodified	202,576	187,391	135,413	.72
Advanced	57,669	50,182	49,025	.98
Furfuryl type resins	7,510	...	...	...
Melamine-formaldehyde resins(an amino resin)	188,374	146,923	79,681	.54
Phenolic and other tar acid resins	1,305,294	999,930	382,986	.38
Polyester resins, unsaturated[7]	865,198	707,443	303,927	.43
Polyether and polyester polyols for urethanes[8]	1,346,337	988,729	344,282	.34
Polyurethane elastomer and plastic products, total	207,524	170,023	159,722	.94
Elastomers[9]	81,182	65,404	84,307	1.29
Plastics[10]	126,342	104,619	75,415	.72
Silicone resins	15,223	13,084	31,348	2.40
Urea-formaldehyde resins (an amino resin)	1,041,360	920,866	168,453	.18
Other thermosetting resins	26,182	23,519	20,289	.86
THERMOPLASTIC RESINS				
Total	23,710,409	20,156,227	6,740,891	.33
Acrylic resins[11,12]	888,469	...	...	...
Engineering plastics[13]	92,723	98,879	96,800	.98
Petroleum hydrocarbon resins	306,143	293,480	69,649	.24
Polyamide resins, nylon type[11,14]	124,313	77,131	86,303	1.12
Polyamide resins, non-nylon type	30,967	27,951	31,413	1.12
Polyester resins, saturated[11,15]	107,910	62,663	68,021	1.09
Polyethylene resins, total	8,774,658	7,583,224	2,193,686	.29
Density 0.940 and below	5,661,328	4,720,630	1,385,531	.29
Density over 0.940	3,113,330	2,862,594	808,155	.28
Polyimides and amide-imide polymers	2,153	...	...	...
Polypropylene resins	2,550,950	2,063,442	582,339	.28
Polyterpene resins	13,055	12,778	5,850	.46
Polytetrafluorethylene (PTFE)	15,567	13,015	45,453	3.49
Rosin esters, unmodified (ester gums)	20,950	22,248	9,161	.41
Rosin esters, modified	43,421	41,254	17,799	.43
Styrene plastics materials, total	4,742,895	4,390,297	1,530,761	.35
Acrylonitrile-butadiene-styrene (ABS) resins	1,003,074	938,861	430,878	.46
Straight polystyrene	2,207,887	1,988,801	582,399	.29
Rubber modified polystyrene	778,208	773,426	218,764	.28
Other styrene copolymers	251,053	221,019	131,136	.59
Styrene-butadiene latexes	303,205	298,751	103,589	.35
All other styrene latexes	29,851	24,387	9,551	.39
All other styrene type plastics materials	169,617	145,052	54,444	.37

TABLE 1.--PLASTICS AND RESIN MATERIALS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

PLASTICS AND RESIN MATERIALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
THERMOPLASTIC RESINS--Continued	*1,000 pounds dry basis*[2]	*1,000 pounds dry basis*[2]	*1,000 dollars*	*Per pound*
Vinyl resins, total[16]	5,553,205	4,427,173	1,343,119	$0.30
Polyvinyl chloride and copolymers	4,544,811	3,579,067	925,609	$0.26
Polyvinyl acetate[17]	617,152	548,276	216,743	.40
Polyvinyl alcohol[18]	126,465	105,628	67,091	.64
Polyvinyl butyral resins	...	42,913	64,336	1.50
Polyvinylidene chloride latex resins	16,640	16,053	9,483	.59
Other vinyl and vinylidene resins	248,137	135,236	59,857	.44
All other thermoplastic resins[19]	443,030	1,042,692	660,537	.63

[1] Calculated from rounded 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 benzenoid plastics and resin materials as defined in part 1 of schedule 4 of the Tariff Schedules of the United States; also includes urethane type elastomers which are not defined in part 1 of schedule 4 of the TSUS.

[4] The total now includes data for styrene alkyd polyesters.

[5] 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.

[6] Data shown for advanced epoxy resins are that part of the unmodified epoxy resins which is further processed.

[7] Polyester resins are unsaturated alkyd resins, later to be copolymerized with a monomer (such as styrene or methyl methacrylate), and polyallyl resins (such as diallyl phthalate and diglycol carbonate). Data are on an "as sold" basis, including monomer if part of the resin system.

[8] 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-diisocyanate. Statistics for the isocyanic acid derivatives are reported in the cyclic intermediates section of the Synthetic Organic Chemicals report.

[9] Data for urethane type elastomers are now included in this section of the Synthetic Organic Chemicals report; these statistics previously were reported under the elastomers (synthetic rubber) section. 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.

[10] The term plastic encompasses compounds containing additives such as plasticizers (Whittington's Dictionary of Plastics, First Edition, published by Technomic Publishing Co., Inc.).

[11] Does not include production or sales for fiber use.

[12] Includes data for acrylic resins reported to the U.S. International Trade Commission as thermosetting resins.

[13] Engineering plastics: Includes acetal, polycarbonate, polyimide (sales only; production separately shown), polysulfone, and polyphenylene oxide. Engineering plastics are defined in Whittington's Dictionary of Plastics, as "Those [plastics] 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. The other plastics named in Whittington's Dictionary as engineering plastics, ABS resins and nylon resins, are not included in the above list as they are published separately.

[14] Statistics for nylon 6 and nylon 6/6 which are used in plastic applications (e.g., molding etc.) are included here.

[15] Statistics for polyethylene terephthalate which is used in plastics applications (e.g., molding, etc.) are included here.

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

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

[18] Production and sales do not include polyvinyl alcohol used as a reactive intermediate for polyvinyl butyral or other vinyl resins.

[19] Includes acrylic resins (sales only), cellulose plastics and resins, coumarone-indene resins, polybutylene type resins, fluorocarbon resins except PTFE, and other thermoplastics 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.

TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS' IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AN "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
THERMOSETTING RESINS	
THERMOSETTING RESINS:	
ACETONE-FORMALDEHYDE RESINS	ACY, AMP.
ALKYD RESINS:	
ALL OTHER COPOLYMER ALKYDS	FLW, GLD, MCC, PPG, REL, STT.
@PHTHALIC ANHYDRIDE TYPE-	APT, ASH, AZS, BAL, BEN, BRU, CEL, CGL, CNE, CPV, DEG, DSO, DUP, EW, FAR, FCD, FLW, FOC, FRE, GEI, GIL, GLD, GRV, HAN, ICP, IMC, JOB, KMC, KMP, KPT, MCC, MID, MNP, , MRO, NPV, OBC, PER, PFP, PPG, PRT, RCI, RED, REL, RH, SCN, SED, SKT, SM, STT, SW(E), X.
@POLYBASIC ACID TYPE-	ACY, ASH, BEN, CGL, DSO, EW, FAR, FOC, GEI, GRV, HAN, ICP, IMC, MCC, MID, MOB(E), PLS, PPG, RCI, RED, REL, RH, SCN, SED, SKT, SM, STT, SW(E).
@STYRENATED-ALKYDS, OR COPOLYMER ALKYDS	ACY, APT, ASH, CEL, CGL, CNE, CPV, DSO, EW, FLW, FRE, GLD, GRV, HAN, ICP, JOB, KPT, MCC, PPG, REL, SM, STT, SW(E).
AMINO RESINS:	
@MELAMINE-FORMALDEHYDE RESINS	ACS, ACY, AMP, BOR, CBD, CEL, CGL, CNE, CPV, DAN, DSO, DUP, ENJ, GLD, GRV, HAN, KPT, MID, MON, MRA, OCF, PMC, PPG, PPL, QCP, RCI, REL, RH, SED, SM, SNW(E), STC, SW(E), USO, VAL, WRD.
@UREA-FORMALDEHYDE RESINS	ACS, ACY, AMP, APX, BOR, CBD, CBM, CEL, CGL, CMP, CNE, CPV, DAN, DSO, DUP, FMS, GAF, GLD, GOC, GP, GRV, HAN, HNC, HPC, HRT, IRI, KPT, MMM, MON, MRA, NTC, PC(E), PMC, PPG, PPL, RCI, REL, RH, RPC, SAC, SNW(E), SOR, USO, VAL, X.
DICYANDIAMIDE RESINS	APX, ECC, MRA, RPC, S, SNW(E), STC, VAL, VPC.

TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
THERMOSETTING--CONTINUED	
@EPOXY RESINS:	
@ADVANCED	ACS, ASH, BEN, CEL, DSO, EW, GRV, HAN, HYC, ICF, MCC, MIL, MRT(E), NPV, OCF, POL, PPG, RCI, RSY, SCN, SM, WLN.
@UNMODIFIED	CEL, CGY, DA, DOW, ICF, JOB, MMM, RCI, RSY, SHC, SM, STT, UCC.
@FURFURYL TYPE RESINS	ACR, HVG, STC, UNO, WRD.
@PHENOLIC AND OTHER TAR ACID RESINS	ABS, ACR, ACS, AMP, ASH, BME, BOR, CBD, CBM, CGL, CLK, DA, ENJ, EW, FAR, FOM, GE, GEI, GIL, GLD, GOC, GP, GRG, HER, HKD, HPC, HVG, ICF, INL, IRI, KPT, MCA, MID, MMM, MON, MRB, NCI, NTC, OCF, PLS, PPG, PPL, PYZ, RAB, RCI, RGC, RH, RPC, SCN, SHA, SIM, SKT, SM, SPL, STC, SW(E), UCC, USR, VPC, VSV, WCA, WRD.
POLYESTER RESINS, UNSATURATED, AND ALLYL RESINS:	
ALLYL RESINS	ACS, FMP(E), SM.
@POLYESTER RESINS, UNSATURATED	ACS, ACY, APT, ASH, AZS, CGL, CNE, CPV, DA, DOW, DSO, EW, FAR, FCD, FRE, GEI, GLD, GRG, HKD, ICF, ICI, IPC, KMC, KPT, MCC, MFG, MMM, MOB(E), MRB, MRO, OBC, OCF, POL, PPG, PPL, RCI, RH, RSC, RSY, SCN, SIL, SLC, SM, SW(E), WLN.
@POLYETHER AND POLYESTER POLYOLS FOR URETHANES	APT, ARK, BAS, CHC, CPV, DOW, DSO, DUP, FRE, GPM, HPC, ICI, JCC, JOB, MCC, MOB(E), NTL, OCF, OMC, PPG, RCI, SKT, UCC, UNO, UPJ, WTC.
POLYURETHANE ELASTOMER AND PLASTIC PRODUCTS:	
@PLASTICS	APT, ASH, BAS, CGL, CPV, DSO, DUP, EW, FAR, ICF, ICI, KMC, MCC, MID, MNP, MOB(E), MRT(E), NTL, OMC, PFP, PPG, QUN, RCI, SCN, SLC, SM, SW(E), UPJ, USM, USR, WLN, WTC.
@ELASTOMERS	ACY, BAS, BFG, CNI, DA, DNS, DUP, EPI, GRD, INP, MMM, MOB(E), PFP, PLN, PPG, PRC, PRT, REZ, RUB, TKL, UPJ, USR, WTC.
@SILICONE RESINS	ASH, CGL, DCC, GLD, JOB, RCI, SM, SPD, SWS, UCC(E).
TOLUENESULFONAMIDE RESINS	MON.
@ALL OTHER THERMOSETTING RESINS	APX, ENJ, GLD, GRV, ICF, MID, OBC, PPG, S, SHC, SM, USO, VAL.

TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
THERMOPLASTICS RESINS	
THERMOPLASTIC RESINS:	
ACRYLIC RESINS:	
@ALL OTHER ACRYLIC RESINS	ACY, AZS, CEL, CHP, DSO, DUP, EFH, GLC, GLD, GNM, GRD, ICF, JNS, JWC, MID, MRA, NPV, PPG, PRT, PVI, QUN, RH, SM, SNW(E), UBS, X.
ETHYL ACRYLATE BUTYL ACRYLATE COPOLYMER	VAL.
POLYETHYL METHACRYLATE	SAR.
@POLYMETHYL METHACRYLATE	ASH, CNE, DSO, DUP, ICF, IOC, JOB, PPG, PVI, RH, SAR.
THERMOSETTING ACRYLICS	CPV.
CELLULOSE PLASTICS AND RESINS:	
CELLULOSE NITRATE	HPC.
ALL OTHER CELLULOSE PLASTICS	DSO, DUP, EKT.
CELLULOSE PLASTICS,ETHYL CELLULOSE	DOW.
COUMARONE-INDENE RESINS	DUP, HPC, NEV, VEL.
ENGINEERING PLASTICS:	
ACETAL RESINS	CEL, DUP.
POLYCARBONATE RESINS	GE, MOB(E).
POLYIMIDES AND AMIDE-IMIDE POLYMERS	ACC, DUP, EW.
POLYPHENYLENE OXIDE TYPE RESINS	EW, GE.
POLYSULFONE RESINS	UCC.
FLUOROCARBON RESINS:	
@POLYTETRAFLUOROETHYLENE (PTFE)	ACS, DUP, ICI.
ALL OTHER FLUOROCARBON RESINS	ACS, DUP, MMM, PAS.
@PETROLEUM HYDROCARBON RESINS	EKX, GRV, GYR, HPC, ICF, NEV, NPV, RCI, TKL(E), VEL.
POLYAMIDE RESINS:	
@NON-NYLON TYPE	AMP, CBY, COO(E), DLG, EMR, GNM, MCC, SM, SNW(L), USM.
@NYLON TYPE	ALF, AZS, BCM, CEL, CTR, DUP, FG, FRF, GNM, MON, POL, RSN, USM.
POLYACRYLATE RESIN EMULSIONS	GLC.
POLYBUTYLENE TYPE RESINS	WTC.
@POLYESTER RESINS, SATURATED	CEL, COO(E), DEG, DSO, EKT, GE, GEI, GLD, GNM, HAN, ICF, ICI, MCC, MRT(E), RUB, SED, STT, USM.
POLYETHYLENE AND COPOLYMERS RESINS:	
@DENSITY 0.940 AND BELOW (LOW DENSITY)	ACS, CBN, CPX, DOW, DUP, EKX, ENJ, GOC, KPP, NWP, ORO, PLC, RCC, UCC.
DENSITY OVER 0.940 (HIGH DENSITY)	ACC, ACS, CPX, DOW, DUP, GOC, HPC, KPP, MON, PLC, SHC, SLT, UCC, USI.
@POLYPROPYLENE POLYMER AND COPOLYMER RESINS	ACC, DA, EKX, ENJ, HPC, NVT, PLC, RCC, SHC.

TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MATERIAL	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
THERMOPLASTICS RESINS--CONTINUED	
@POLYTERPENE RESINS	CBY, HPC, SCN.
ROSIN MODIFICATIONS:	
@MODIFIED ROSIN ESTERS	ASH, CBY, DPP, EW, FAR, FLW, FRP, GLD, GRV, MCC, RCI, SHA, STC, SW(E), TKL(E).
MODIFIED ROSIN	DPP.
@ROSIN ESTERS, UNMODIFIED	ASH, CBY, DPP, FCD, FRP, RCI.
STYRENE TYPE PLASTICS MATERIALS:	
@ACRYLONITRILE-BUTADIENE-STYRENE (ABS) TERPOLYMER RESINS	BFG, CSD, DOW, FG, FRS, GRD, GYR, MCB, MON, RCC, USR.
ALPHA-METHYL STYRENE POLYMERS	ACC, DOW, JNS.
@STYRENE-ACRYLONITRILE COPOLYMER RESINS (SAN)	BFG, DOW, MON, SKT, UCC.
POLYSTYRENE:	
@RUBBER MODIFIED POLYSTYRENE	ASY, DOW, GOR, MON, SHC, SOL, USS.
@STRAIGHT POLYSTYRENE	ACC, AEP, BAS, CSD, DOW, DSO, FG, GOR, HLM, KPP, MMM, MON, RCC, RCD, SHC, SOL, UCC, USS, WLC.
STYRENE ALLYL ALCOHOL COPOLYMER	MON.
@ALL OTHER STYRENE COPOLYMERS	BFG, DA, DOW, DSO, DUP, GRD, GYR, HPC, IOC, JNS, MON, MRT(E), PLC, PPG, PVI, RCC, RCD, RH, SED, SKT, UBS, UOC(E), VEL.
STYRENE LATEXES:	
@STYRENE-BUTADIENE LATEXES	BOR, CEL, DOW, GAF, GNT, GRD, GYR, USR.
ALL OTHER STYRENE LATEXES	BFG, BOR, DOW, FIR, GNT, GRD.
VINYL RESINS:	
@POLYVINYL ACETATE RESINS	AIP, AZS, BAL, BEN, BLS, BOR, CEL, CNE, DAN, DSO, FAR, FLH, FLN, GLC, GRD, JOB, KMC, KMP, MCC, MON, NPV, NSC, OBC, QCP, RCI, RPC, SCO, SED, SPC, UCC, UOC(E), X.
@POLYVINYL ALCOHOL RESINS	AIP, DUP, MON.
@POLYVINYL BUTYRAL RESINS	DUP, MON, UCC.
@POLYVINYL CHLORIDE AND COPOLYMER RESINS	AIP, AME, BFG, BOR, CNT, CO, DA, FIR, GNT, GP, GRA, GYR, HN, KYS, NSC, PNT, RUB, SFP, SLM, TNA, UCC, USR.
@POLYVINYLIDINE CHLORIDE RESINS:	
@LATEX TYPE POLYVINYLIDENE CHLORIDE RESINS	BFG, DOW, GRD, MRT(E), UBS.
VINYL-ACRYLATE COPOLYMER RESINS	DSO.
ALL OTHER VINYL RESINS	DOW, DUP, EW, FLW, MON, RH, UCC.
THERMOPLASTIC CHLORINATED POLYOLEFINS	EKX.
@ALL OTHER THERMOPLASTIC RESINS	CWN(E), DSO, ENJ, GLD, HPC, PLC, RPC.

TABLE 3.--PLASTICS AND RESIN MATERIALS: DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of plastics and resin materials to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
ABS	Abex Corp., Friction Products Group
ACC	Amoco Chemical Corp.
ACR	CPC International, Inc., Acme Resin Co. Div.
ACS	Allied Chemical Corp., Specialty Chemical Div.
ACY	American Cyanamid Co.
AEP	A & E Plastics Pak Co., Inc.
AIP	Air Products & Chemicals, Inc.
ALF	Allied Chemical Corp., Fibers Div.
AME	Stauffer Chemical Co.
AMR	Pacific Resins & Chemical Co.
APT	Whittaker Corp., Whittaker Coatings & Chemical, Mol Rez Resins
APX	Apex Chemical Co., Inc.
ARK	Armstrong Cork Co.
ASH	Ashland Oil, Inc., Ashland Chemical Co. Div.
ASY	American Synthetic Rubber Corp.
ATR	Atlantic Richfield Co.
AZS	AZS Corp., AZ Products Co. Div.
BAL	Baltimore Paint & Chemical Corp.
BAS	BASF Wyandotte Corp.
BCM	Belding Chemical Industries
BEN	Bennett's
BFG	B.F. Goodrich Co., B.F. Goodrich Chemical Co. Div.
BLS	Life Savers, Inc.
BME	Bendix Corp., FMD Div.
BOR	Borden Co., Borden Chemical Co. Div.
BRU	M.A. Bruder & Sons, Inc.
CBD	Chembond Corp.
CBM	Carborundum Co.
CBN	Cities Service Co., Petrochemicals Div.
CBY	Crosby Chemicals, Inc.
CEL	Celanese Corp.:
	Celanese Plastics Co.
	Celanese Polymer Specialties Co.
CGL	Cargill, Inc.
CGY	Ciba-Geigy Corp., Resins Dept.
CHC	Choate Chemical Co.
CHP	C.H. Patrick & Co., Inc.
CLK	Clark Chemical Corp.
CMP	Commercial Products Co., Inc.
CNE	Conchemco, Inc.
CNI	Conap, Inc.
CNT	CertainTeed Corp.
CO	Continental Oil Co.
COO	The Terrell Corp.
CPV	Cook Paint & Varnish Co.
CPX	Chemplex Co.
CSD	Cosden Oil & Chemical Co.
CTR	Customs Resins, Inc.
CWN	Upjohn Co., Fine Chemical Div.
DA	Diamond Shamrock Corp.
DAN	Dan River, Inc.
DCC	Dow Corning Corp.
DEG	Degan Oil & Chemical Co.
DGO	Day-Glo Color Corp.
DNS	Dennis Chemical Co.
DOW	Dow Chemical Co.
DPP	Dixie Pine Products Co., Inc.
DSO	DeSoto, Inc.
DUP	E.I. duPont de Nemours & Co., Inc.
ECC	Eastern Color & Chemical Co.
EFH	E.F. Houghton & Co.
	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
EKX	Texas Eastman Co. Div.
EMR	Emery Industries, Inc.
ENJ	Exxon Chemical Co. U.S.A.
EPI	Eagel Pitcher Industries, Inc., Ohio Rubber Co.
EW	Westinghouse Electric Corp., Industrial Plastics Div., Chemical Products Plant
FAR	Syncon, Inc., Farnow Div.
FCD	Synres Chemical Corp.
FG	Foster Grant Co., Inc.
FIR	Firestone Tire & Rubber Co., Firestone Plastics Co. Div.
FLH	H.B. Fuller Co.
FLN	Franklin Chemical Corp.
FLW	Fuller-O'Brien Corp.
FMP	FMC Corp., Industrial Chemical Div.
FMS	First Mississippi Corp.
FOC	Handschy Chemical Co., Farac Oil & Chemical Co. Div.
FOM	Formica Corp.
FRE	Freeman Chemical Corp.
FRF	Firestone Tire & Rubber Co., Firestone Synthetic Fibers Co.
FRP	FRP Company
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.
GAF	GAF Corp., and Chemical Div.
GE	General Electric Co.:
GEI	Insulating Materials Products Sec.
GIL	Gilman Paint & Varnish Co.
GLC	General Latex & Chemical Corp.
GLD	SCM Corp., Coatings and Resins Div.
GNM	General Mills Chemicals, Inc.
GNT	General Tire & Rubber Co., Chemical Plastics Div.
GOC	Gulf Oil Corp., Gulf Oil Chemicals Co.-U.S.
GOR	Carl Gordon Industries, Inc.
GP	Georgia-Pacific Corp.:
	Rebecca Chemical Div.
	Resins Operations
GPM	General Plastics Manufacturing Co.
GRA	Great American Chemical Corp.
GRD	W.R. Grace & Co., Polymers Chemicals Div.
GRG	P.D. George Co.
GRV	Guardsman Chemical Coatings, Inc.
GYR	Goodyear Tire & Rubber Co.
HAN	Hanna Chemical Coating Corp.
HER	Heresite & Chemical Co.
HKD	Hooker Chemical Corp., Durez Div.
HLM	U.S. Industries, Inc., E. Helman Co. Div.

TABLE 3.--PLASTICS AND RESIN MATERIALS: DIRECTORY OF MANUFACTURERS, 1976--CONTINUED

Code	Name of company
HN	Tenneco Chemicals, Inc.
HNC	H & N Chemical Co.
HPC	Hercules, Inc.
HRT	Hart Products Corp.
HVG	Haveg Industries, Inc. Sub. of Hercules, Inc.
HYC	Dexter Corp., Hysol Co. Div.
ICF	Inmont Corp.
ICI	ICI United States, Inc.: Plastics Div. Specialty Chemicals Div.
IMC	IMC Chemical Group, Inc., McWorter Resins
INL	Inland Steel Co., Inland Steel Container Co. Div.
INP	Indipol, Inc.
IOC	Ionac Chemical Co. Div. of Sybron Corp.
IPC	Interplastic Corp.
IRI	Ironsides Resins, Inc.
JCC	Jefferson Chemical Co.
JNS	S.C. Johnson & Son, Inc.
JOB	Jones-Blair Paint Co.
JSC	Jersey State Chemical Co.
JWC	J.W. Carroll & Sons Div. of U.S. Industries Inc.
KMC	Kohler-McLister Paint Co.
KMP	Kelly-Moore Paint Co.
KPP	Arco/Polymers, Inc.
KPT	Koppers Co., Organic Materials Div.
KYS	Keysor Corp.
MCA	Masonite Corp., Alpine Div.
MCB	Borg-Warner Corp., Borg-Warner Chemicals
MCC	McCloskey Varnish Co.
MFG	Rockwell International Corp., Plastics Div.
MID	Dexter Corp., Midland Div.
MMM	Minnesota Mining & Manufacturing Co.
MNP	The Valspar Corp.
MOB	Mobay Chemical Co.
MON	Monsanto Corp.
MRA	Bostik South, Inc.
MRB	Marblette Co.
MRO	W.R. Grace & Co., Hatco Polyester Div.
MRT	Morton Chemical Co. Div. of Morton Norwich Products, Inc.
NCI	Union Camp Corp.
NEV	Neville Chemical Co.
NPV	Norris Paint & Varnish Co., Inc.
NSC	National Starch & Chemical Corp.
NTC	National Casein Co.
NTL	NL Industries, Inc.
NVT	Novamont Corp., Neal Works
NWP	Northern Petrochemical Co.
OBC	O'Brien Corp.
OCF	Owens-Corning Fiberglas Corp.
OMC	Olin Corp.
ORO	Chevron Chemical Co.
PAS	Pennwalt Corp.
PC	Proctor Chemical Co., Inc.
PER	Perry & Derrick Co.
PFP	Midwest Manufacturing Corp.
PLC	Phillips Petroleum Co.
PLN	Disogrin Industries Corp.
PLS	Plastics Engineering Co.
PMC	Plastics Manufacturing Co.
PNT	Pantasote Co.
POL	Polymer Corp.
PPG	PPG Industries, Inc.
PPL	Pioneer Plastics Div. of LOF Plastics, Inc.
PRC	Products Research & Chemical Co.
PRT	Pratt & Lambert, Inc.
PVI	Polyvinyl Chemical Ind.
PYZ	Polyrez Co., Inc.
QCP	Quaker Chemical Corp.
QUN	K.J. Quinn & Co., Inc.
RAB	Raybestos-Manhattan, Inc., R.M. Friction Materials Co. Div.
RBT	Robintech, Inc.
RCC	Rexene Polyolefins Co.
RCC	Rexene Styrenics Co.
RCD	Richardson Co., Polymeric Septems Div.
RCI	Reichhold Chemicals Inc.
RED	Red Spot Paint and Varnish Co., Inc.
REL	Reliance Universal, Inc., Louisville Resins Operations
REZ	Hexcel Corp., Rezolin Div.
RGC	Rogers Corp.
RH	Rohm & Haas Co.
RPC	Millmaster Onyx Corp., Refined-Onyx Div.
RSC	Resinous Chemicals Corp.
RSN	Rilsan Corp.
RSY	Resyn Corp.
RUB	Hooker Chemical Corp., Ruco Div.
S	Sandoz, Inc.
SAC	Southeastern Adhesives Co.
SAR	Sartomer Industries, Inc.
SCN	Schenectady Chemicals, Inc.
SCO	Scholler Bros., Inc.
SED	Conchemco, Inc., Colony Paint
SFP	Stauffer Chemical Co., Plastics Div.
SHA	Shanco Plastics & Chemicals, Inc.
SHC	Shell Oil Co., Shell Chemical Co. Div.
SIC	Vistron Corp., Silmar Div.
SIM	Simpson Timber Co.
SKP	Shakespeare Co., Monofilament Div.
SKT	Textron Inc., Spencer Kellogg Div.
SLC	Soluol Chemical Co., Inc.
SLT	Soltex Polymer Corp.
SM	Mobil Oil Corp., Mobil Chemical Co., Chemical Coatings Div.
SNW	Sun Chemical Corp., Chemicals Div.
SOL	Polysar Resins, Inc.
SOR	Thomason Industries, Inc., Southern Resin Div.
SPC	Insilco Corp., Sinclair Paint Co. Div.
SPD	General Electric Co., Silicone Products Dept.
SPL	Spaulding Fibre Co., Inc.

TABLE 3.--Plastics and resin materials: Directory of manufacturers, 1976--Continued

Code	Name of company	Code	Name of company
STC	American Hoechst Corp., Sou-Tex Works	USI	National Petro Chemical Corp.
STT	Standard T Chemical Co.	USM	USM Corp., Bostik Div.
SW	Sherwin-Williams Co.	USO	U.S. Oil Co.
SWS	Stauffer Chemical Co., SWS Silicones Div.	USR	Uniroyal, Inc., Chemical Div.
		USS	USS Chemicals Div. of U.S. Steel Corp.
		VAL	Valchem
TKL	Thiokol Corp.	VEL	Veliscol Chemical Corp.
TNA	Ethyl Corp.	VPC	Mobay Chemical Corp., Verona Div.
TX	Texaco, Inc.	VSV	Valentine Sugars, Inc.
UBS	A.E. Staley Manufacturing Co., Chemicals Specialties Div.	WCA	West Coast Adhesives Co.
		WLN	Wilmington Chemical Corp.
UCC	Union Carbide Corp.	WRD	Weyerhaeuser Co.
UNO	United-Erie, Inc.	WTC	Witco Chemical Co., Inc.
UOC	Union Oil Co. of California		
UPJ	Upjohn Co.	ZGL	Carolina Processing Corp.
USI	National Distillers & Chemical Corp., U.S. Industrial Chemicals Co. Div.		

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

RUBBER-PROCESSING CHEMICALS

David B. Beck

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, blowing agents, and peptizers. Data on production and sales of rubber-processing chemicals in 1976 are given in table 1[1].

Production of rubber-processing chemicals as a group in 1976 amounted to 384 million pounds, or 37.8 percent more than the 279 million pounds in 1975. Sales of rubber-processing chemicals in 1976 amounted to 224 million pounds, valued at $247 million, compared with 204 million pounds, valued at $207 million, in 1975.

The production of cyclic rubber-processing chemicals in 1976 amounted to 304 million pounds, or 35.1 percent more than the 225 million pounds in 1975. Sales in 1976 were 186 million pounds, valued at $218 million, compared with 173 million pounds, valued at $187 million, in 1975. Of the total production of cyclic rubber-processing chemicals in 1976, accelerators, activators, and vulcanizing agents accounted for 42.3 percent and antioxidants, antiozonants, and stabilizers for 52.8 percent. Production of antioxidants, antiozonants, and stabilizers, which amounted to 160.3 million pounds in 1976, included 121.2 million pounds of amino compounds and 39.1 million pounds of phenolic and phosphite compounds. Sales of amino antioxidants, antiozonants, and stabilizers in 1976 amounted to 80.1 million pounds, valued at $94.4 million, sales of phenolic and phosphite antioxidants, antiozonants, and stabilizers, were 26.0 million pounds, valued at $30.4 million.

Production of acyclic rubber-processing chemicals in 1976 amounted to 49.7 million pounds, or 8.0 percent less than the 54.0 million pounds reported for 1975. Sales in 1976 totaled 37.9 million pounds, valued at $28.6 million, compared with 31.2 million pounds, valued at $20.0 million, in 1975. Dithiocarbamic acid derivatives accounted for 15.0 percent of sales (based on quantity) of acyclic rubber-processing chemicals in 1976 and bis-(dimethylthiocarbamoyl) disulfide accounted for 12.9 percent.

1/ See also table 2 which lists these producers and identifies the manufacturers by codes. These codes are given in table 3.

RUBBER-PROCESSING CHEMICALS

TABLE 1.--Rubber-processing chemicals: U.S. production and sales, 1976

[Listed below are all rubber-processing chemicals for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists separately all rubber-processing chemicals for which data on production and/or sales were reported and identifies the manufacturers of each]

RUBBER-PROCESSING CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	384,423	224,272	246,857	$1.10
RUBBER-PROCESSING CHEMICALS, CYCLIC				
Total	334,735	186,393	218,263	1.17
Accelerators, activators, and vulcanizing agents, total	159,614	66,194	68,678	1.04
Aldehyde-amine reaction products	722	649	1,078	1.66
Dithiocarbamic acid derivatives	209	172	624	3.62
Thiazole derivatives, total	118,048	58,010	55,860	.96
N-Cyclohexyl-2-benzothiazolesulfenamide	4,097	2,937	3,488	1.19
2,2'-Dithiobis(benzothiazole)	18,538	8,331	7,134	.86
2-Mercaptobenzothiazole	...	5,351	3,217	.60
All other thiazole derivatives	95,413	41,391	42,021	1.02
All other accelerators, activators, and vulcanizing agents[2]	40,635	7,363	11,116	1.51
Antioxidants, antiozonants, and stabilizers, total	160,307	106,146	124,791	1.18
Amino compounds, total	121,173	80,111	94,404	1.18
Aldehyde- and acetone-amine reaction products	...	4,363	4,133	.95
Substituted p-phenylenediamines	71,780	41,776	58,311	1.40
N-Phenyl-2-naphthylamine	746	...	...	...
All other amino compounds[3]	48,647	33,972	31,960	.94
Phenolic and phosphite compounds, total	39,134	26,035	30,387	1.17
Phenolic compounds, total	22,496	15,060	24,259	1.61
Polyphenolics (including bisphenols)	13,662	10,977	20,015	1.82
Phenol, alkylated	5,543	1,567	1,167	.74
Other	3,291	2,516	3,077	1.22
Phosphite compounds	16,638	10,975	6,128	.56
Peptizers	1,856	1,850	2,145	1.16
Retarder: N-Nitrosodiphenylamine	1,307	843	817	.97
All other cyclic rubber-processing chemicals[4]	11,651	11,360	21,832	1.92
RUBBER-PROCESSING CHEMICALS, ACYCLIC				
Total	49,688	37,879	28,594	.75
Dithiocarbamic acid derivatives, total[5]	8,094	5,777	7,810	1.35
Dibutyldithiocarbamic acid, sodium salt	...	70	61	.87
Dibutyldithiocarbamic acid, zinc salt	2,919	2,367	2,645	1.54
Dimethyldithiocarbamic acid, zinc salt	1,893	1,377	1,251	.91
All other dithiocarbamic acid derivatives	3,282	1,963	3,853	1.96
Bis(dimethylthiocarbamoyl) disulfide	5,358	4,895	3,832	.78
Bis(dimethylthiocarbamoyl) sulfide	2,266	2,034	3,069	1.51
Shortstops: Dimethyldithiocarbamic acid, sodium salt	3,080	...	...	...
All other acyclic rubber-processing chemicals[6]	30,890	25,173	13,883	.55

1/ Calculated from rounded figures.

2/ Includes guanidines and other uses not separately shown.

3/ Includes aldehyde- and acetone-amine reaction products (production only) and N-phenyl-2-naphthylamine (sales only).

4/ Includes blowing agents and other uses not separately shown.

5/ 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 report "Pesticides and Related Products".

6/ Includes "other" thiurams, xanthates, sulfides, conditioning and lubricating agents, polymerization regulators, shortstops, and other uses not separately shown.

TABLE 2.--RUBBER PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AND "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

RUBBER PROCESSING CHEMICALS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC	
@ACCELERATORS, ACTIVATORS AND VULCANIZING AGENTS:	
@ALDEHYDE-AMINE REACTION PRODUCTS:	
ACETALDEHYDE-ANILINE CONDENSATE	USR.
BIS(CINNAMYLIDENE) HEXAMETHYLENEDIAMINE	DUP.
NORMAL-BUTYRALDEHYDE-ANILINE CONDENSATE	DUP, RCD.
HEPTALDEHYDE-ANILINE CONDENSATE	USR.
TRIETHYLTRIMETHYLENETRIAMINE	USR.
@DITHIOCARBAMIC ACID DERIVATIVES:	
DIBENZYLDITHIOCARBAMIC ACID, SODIUM SALT	USR.
DIBENZYLDITHIOCARBAMIC ACID, ZINC SALT	USR.
DIBUTYLDITHIOCARBAMIC ACID, N,N-DIMETHYLCYCLOHEXYL AMINE SALT	MON.
2,4-DINITROPHENYL DIMETHYLDITHIOCARBAMATE	USR.
PIPERIDINECARBODITHIOIC ACID, PIPERIDINIUMPOTASSIUM SALTS,	DUP.
GUANIDINES:	
DICATECHOL BORATE, DI-ORTHO-TOLYLGUANIDINE SALT	DUP.
1,3,-DIPHENYLGUANIDINE	ACY.
1,3-DI-ORTHO-TOLYLGUANIDINE	ACY.
@THIAZOLE DERIVATIVES:	
2-BENZOTHIAZYL N,N-DIETHYLTHIOCARBAMOYL SULFIDE	PAS.
1,3-BIS(2-BENZOTHIAZOLYLMERCAPTOMETHYL) UREA	LAK.
N-TERT-BUTYL-2-BENZOTHIAZOLESULFONAMIDE	ACY, BFG, USR, X.
@N-CYCLOHEXYL-2-BENZOTHIAZOLESULFENAMIDE	ACY, BFG, MON, USR.
N,N-DIISOPROPYL-2-BEZOTHIAZOLESULFENAMIDE	ACY.

TABLE 2.--RUBBER PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

RUBBER PROCESSING CHEMICALS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@ACCELERATORS, ACTICATORS AND VULCANIZING AGENTS--CONTINUED	
@THIAZOLE DERIVATIVES--CONTINUED	
N-(2,6-DIMETHYLMORPHOLINO)-2-BENZOTHIAZOLESULFENAMIDE	MON.
@2,2'-DITHIOBIS (BENZOTHIAZOLE)	ACY, BFG, GYR, MON, USR.
@2-MERCAPTOBENZOTHIAZOLE	ACY, BFG, GYR, MON, USR.
2-MERCAPTOBENZOTHIAZOLE, COPPER SALT	ACY.
2-MERCAPTOBENZOTHIAZOLE, ZINC CHLORIDE	DUP.
2-MERCAPTOBENZOTHIAZOLE, ZINC SALT	ACY, BFG, USR.
4-MORPHOLINYL 2-BENZOTHIAZYL DISULFIDE	GYR.
N-OXYDIETHYLENE-2-BENZOTHIAZOLESULFENAMIDE	ACY, BFG.
@ALL OTHER CYCLIC ACCELERATORS, ACTIVATORS AND VULCANIZING AGENTS:	
PARA-BENZOQUINONEDIOXIME	ARA.
BIS(MORPHOLINOTHIOCARBONYL) DISULFIDE	ACY.
DIBENZYLAMINE	MLS, USR.
DIMETHYLETHANOLAMINE, TOLUENE-2,4-DIISOCYANATE ADDUCT	DUP.
DI-N,N'-PENTAMETHYLENETHIURAM TETRASULFIDE	DUP, VNC.
2-IMIDAZOLIDENETHIONE (1,3-ETHYLENE-2-THIOUREA)	DUP, RBC.
META-PHENYLENEBISMALEIMIDE	DUP.
POLY-PARA-DINITROSOBENZENE	DUP.
TETRAMETHYLTHIURAM DISULFIDE	DUP.
PARA-TOLUENESULFONIC ACID, ZINC SALT	USR.
@ANTIOXIDANTS, ANTIOZONANTS AND STABILIZERS:	
@AMINO ANTIOXIDANTS, ANTIOZONANTS AND STABILIZERS:	
@ALDEHYDE AND ACETONE-AMINE REACTION PRODUCTS:	
BUTYRALDEHYDE-ANILINE CONDENSATE	DUP.
DIPHENYLAMINE-ACETONE CONDENSATE	ACY, BFG, USR.
PHENYL-2-NAPHTHYLAMINE-ACETONE CONDENSATE	USR.
@SUBSTITUTED P-PHENYLENEDIAMINES:	
ALKYLARYL-PARA-PHENYLAMINE-DIAMINES	MON.
N,N'-BIS(1,4-DIMETHYLPENTYL)-PARA-PHENYLENEDIAMINE	MON, UPM, USR.
N,N'-BIS(1-ETHYL-3-METHYLPENTYL)-PARA-PHENYLENEDIAMINE	UPM.
N,N'-BIS(1-METHYLHEPTYL)-PARA-PHENYLENEDIAMINE	BFG, UPM.
N-CYCLOHEXYL-N'-PHENYL-PARA-PHENYLENEDIAMINE	UPM, USR.
DIARYLENEDIAMINES, MIXED	GYR.

TABLE 2.--RUBBER PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

RUBBER PROCESSING CHEMICALS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@ANTIOXIDANTS, ANTIOZONANTS AND STABILIZERS--CONTINUED	
@AMINO ANTIOXIODANTS, ANTIOZONANTS AND STABILIZERS--CONTINUED	
@SUBSTITUTED P-PHENYLENEDIAMINES--CONTINUED	
N,N-DICYCLOHEXYL-PARA-PHENYLENEDIAMINE	UPM.
N-(1,3-DIMETHYLBUTYL)-N-PHENYL-PARA-PHENYLENEDIAMINE	GYR, UPM, USR.
N,N'-DI-2-NAPHTHYL-PARA-PHENYLENEDIAMINE	BFG.
N,N'-DIPHENYL-PARA-PHENYLENEDIAMINE	BFG, USR.
N-ISOPROPYL-N'-PHENYL-PARA-PHENYLENEDIAMINE	USR.
N-(1-METHYLHEPTYL)-N'-PHENYL-PARA-PHENYLENEDIAMINE	UPM.
N-(1-METHYLPENTYL)-N'-PHENYL-PARA-PHENYLENEDIAMINE	USR.
OTHER AMINES:	
PARA-ANILINOPHENOL	BFG.
1,2-DIHYDRO-6-DODECYL-2,2,4-TRIMETHYLQUINOLINE	X.
1,2-DIHYDRO-6-ETHOXY-2,2,4-TRIMETHYLQUINOLINE	X.
1,2-DIHYDRO-2,2,4-TRIMETHYLQUINOLINE	BFG, X.
DIPHENYLAMINE-STYRENATED	GYR.
DIPHENYLAMINE, SUBSTITUTED	USR.
N,N'-DIPHENYLDIETHYLENEDIAMINE	RCI.
N,N'-DIPHENYL-1,3-PROPANEDIAMINE	RCI.
N,N'-DI-ORTHO-TOLYLETHYLENEDIAMINE	RCI.
4-ISOPROPOXYDIPHENYLAMINE	BFG.
4,4'-METHYLENEDIANILINE	USR.
NONYLDIPHENYLAMINE MIXTURE (MONO-, DI-, AND TRI-)	USR.
OCTYLDIPHENYLAMINE	ACY, USR.
OCTYLDIPHENYLAMINE, ALKYLATED	BFG.
OCTYLDIPHENYLAMINE MIXTURES (MONO-, NONYL-, AND DI-)	DUP.
N-PHENYL-1-NAPHTHYLAMINE	DUP, USR.
@N-PHENYL-2-NAPHTHYLAMINE	BFG, DUP, USR.
TOLUENEDIAMINE (MIXED ISOMERS)	DUP.
PARA-(PARA-TOLUENESULFONAMIDO)DIPHENYLAMINE	USR.
@PHENOLIC AND PHOSPHITE ANTIOXIDANTS AND STABILIZERS:	
PHOSPHITES:	
ALKYLARYL PHOSPHITES MIXED	X.
NONYLPHENYL PHOSPHITES, MIXED	MCB, NPI, USR, X.

TABLE 2.--RUBBER PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

RUBBER PROCESSING CHEMICALS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@ANTIOXIDANTS, ANTIOZONANTS, AND STABILIZERS--CONTINUED	
@PHENOLIC AND PHOSPHITE ANTIOXIDANTS AND STABILIZERS--CONTINUED	
PHOSPHITES--CONTINUED	
POLYMERIC PHOSPHITES	NPI.
POLYPHENOLIC PHOSPHITE, POLYALKYLATED	BFG.
@POLYPHENOLICS (INCLUDING BISPHENOLS):	
BISPHENOL, HINDERED	GYR, USR.
4,4'-BUTYLIDENEBIS(6-TERT-BUTYL-META-CRESOL)	MON.
2,5-DI-SEC-BUTYLDECYLHYDROQUINONE	USR.
2,5-DI-(1,1-DIMETHYLPROPYL)HYDROQUINONE	X.
2,2'-METHYLENEBIS(6-TERT-BUTYL-PARA-CRESOL)	ACY, ASH.
2,2'-METHYLENEBIS(6-TERT-BUTYL-4-ETHYLPHENOL)	ACY.
2,2'-METHYLENEBIS*6-(1-METHYLCYCLOHEXYL)-PARA-CRESOL*	ACY, ICI.
4,4'-THIOBIS(6-TERT-BUTYL-META-CRESOL)	X.
THIOBISPHENOL, ALKYLATED	USR.
1,1,3-TRI(2-METHYL-4-HYDROXY-5-TERT-BUTYLPHENYL) BUTANE	ICI.
@ALL OTHER PHENOLIC ANTIOXIDANTS AND STABILIZERS:	
ORTHO-CRESOL, ALKYLATED	PIT.
@PHENOL, ALKYLATED	ACY, BFG, GYR, NBV, RCI.
PHENOL, HINDERED	DUP, GYR, USR.
PHENOL, STYRENATED, MIXTURES	GYR, NEV, USR.
POLYPHENOL, ALKYLATED	GYR.
N-STEAROYL-PARA-AMINOPHENOL	MLS.
TRIS-(3,5-DI-TERT-BUTYL-4-HYDROXYBENZYL)ISOCYANURATE	X.
@ALL OTHER ANTIOXIDANTS, ANTIOZONANTS AND STABILIZERS:	
2-MERCAPTOBENZIMIDAZOLE	USR.
2-MERCAPTOBENZIMIDAZOLE, ZINC SALT	USR.
WAX BASE, OZONE PROT BO	RCI.
BLOWING AGENTS:	
DINITROSOPENTAMETHYLENETETRAMINE	NPI.
PARA,PARA'-OXYBIS(BENZENESULFONHYDRAZIDE)	USR.
PARA-TOLUENESULFONYL HYDRAZIDE	USR.
PARA-TOLUENESULFONYLSEMICARBAZIDE	USR.

TABLE 2.--RUBBER PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

RUBBER PROCESSING CHEMICALS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@PEPITIZERS:	
2',2'''-DITHIOBIS(BENAZNILIDE)	ACY.
DIXYLYL DISULFIDES, MIXED	PIT.
PENTACHLOROBENZENETHIOL	SDC.
XYLENETHIOL	DUP.
ALL OTHER CYCLIC RUBBER-PROCESSING CHEMICALS:	
PARA-TERT-AMYLPHENOL SULFIDE	PAS
4-CHLORO-2,6-BIS(2,4-DIHYDROXYBENZYL)PHENOL	ICI.
N-(CYCLOHEXYLTHIO)PHTHALAMIDE	X.
2-ETHYL-1,2-NITROPROPYL-4-NITROANILINE	MON.
4,4'-METHYLENEDICARBANILIC ACID, DIPHENYL ESTER	USR.
NITROSODIPHENYLAMINE	ACY, BFG, GYR, NPI, USE.
A C Y C L I C	
@ACCELERATORS, ACTIVATORS AND VULCANIZING AGENTS:	
@DITHIOCARBAMIC ACID DERIVATES:	
ACTIVATED DITHIOCARBAMATES	PAS.
DIBUTYLDITHIOCARBAMIC ACID, NICKEL SALT	USR.
DIBUTYLDITHIOCARBAMIC ACID, POTASSIUM SALT	ALC.
@DIBUTYLDITHIOCARBAMIC ACID, SODIUM SALT	ALC, DUP, USR, VNC.
@DIBUTYLDITHIOCARBAMIC ACID, ZINC SALT	DUP, PAS, USR, VNC.
DIETHYLDITHIOCARBAMIC ACID, CADMIUM SALT AND BIS(DIETHYLTHIOCARBAMOYL) DISULFIDE, MIXTURE	VNC.
DIETHYLDITHIOCARBAMIC ACID, SELENIUM SALT	VNC.
DIETHYLDITHIOCARBAMIC ACID, SODIUM SALT	PAS.
DIETHYLDITHIOCARBAMIC ACID, TELLURIUM SALT	VNC.
DIETHYLDITHIOCARBAMIC ACID, ZINC SALT	ALC, GYR, USR.
DIMETHYLAMMONIUM-DIMETHYLDITHIOCARBAMATE	USR.
DIMETHYLDITHIOCARBAMIC ACID, BISMUTH SALT	VNC.
DIMETHYLDITHIOCARBAMIC ACID, COPPER SALT	VNC.
DIMETHYLDITHIOCARBAMIC ACID, LEAD SALT	VNC.
DIMETHYLDITHIOCARBAMIC ACID, SELENIUM SALT	VNC.
DIMETHYLDITHIOCARBAMIC ACID, SODIUM SALT AND SODIUM POLYSULFIDE	BFG.
@DIMETHYLDITHIOCARBAMIC ACID, ZINC SALT	ALC, FMN, GYR, PAS, USR, VNC.
THIURAMS:	
BIS(DIETHYLTHIOCARBAMOYL) DISULFIDE	DUP, GYR, PAS.
@BIS(DIMETHYLTHIOCARBAMOYL) DISULFIDE	DUP, GYR, PAS.
@BIS(DIMETHYLTHIOCARBAMOYL) SULFIDE	DUP, GYR, USR.

TABLE 2.--RUBBER PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

RUBBER PROCESSING CHEMICALS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C Y C L I C--CONTINUED	
@ACCELERATORS, ACTIVATORS AND VULCANIZING AGENTS--CONTINUED	
THIURAMS--CONTINUED	
BIS(ISOPROPYLOCTADECYLTHIOCARBAMOYL) DISULFIDE	USR.
METHYL-ETHYL THIURAMS, MIXED	PAS.
XANTHATES AND SULFIDES:	
DI-NORMAL-BUTYLXANTHO DISULFIDE	USR.
DIISOPROPYLXANTHO DISULFIDE	BFG.
ZINC DIISOPROPYL XANTHATE	VNC.
ALL OTHER ACYCLIC ACCELERATORS, ACTIVATORS AND VULCANIZING AGENTS:	
PARA-AMINOCYCLOHEXYLMETHANE CARBONATE	DUP.
NORMAL-BUTYRALDEHYDE-BUTYLAMINE CONDENSATE	DUP.
DI-NORMAL-BUTYLAMMONIUM OLEATE	DUP.
3-ETHYL-1,1-DIMETHYL-2-THIOUREA	VNC.
METHACRYLIC ACID, ZINC SALT	USR.
1,1,3-TRIMETHYL-2-THIOUREA	RBC, VNC.
CONDITIONING AND LUBRICATING AGENTS:	
ALKYL ALCOHOLS, MIXED	DUP.
MONO- AND DIALKYL ACID PHOSPHATES, MIXED	DUP.
MONO- AND DIALKYL PHOSPHATE AMMONIUM SALTS, MIXED	DUP.
SODIUM ALKYL SULFATES	DUP.
POLYMERIZATION REGULATORS:	
DODECYL MERCAPTANS	PAS, PLC, X.
TERT-DODECYLMERCAPTANS	PLC.
NORMAL-OCTYL MERCAPTAN	PAS, PLC.
TERT-OCTYL MERCAPTAN	PAS, PLC.
TRIDECYL MERCAPTAN	PAS.
@SHORTSTOPS:	
DIMETHYLDITHIOCARBAMIC ACID, POTASSIUM SALT	USR.
DIMETHYLDITHIOCARBAMIC ACID, SODIUM SALT	ALC, DUP, GYR, USR.
@ALL OTHER ACYCLIC RUBBER-PROCESSING CHEMICALS:	
3,7-DIOCTYLPHENOTHIAZINE	USR.
ZINC LAURATE (ACTIVATOR, PHYSICAL PROPERTY IMPROVER AND PROCESSING AUXILIARY)	USR.

TABLE 3.--Rubber-processing chemicals: Directory of Manufacturers, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of rubber-processing chemicals to the U.S. International Trade Commission for 1976 are listed below in the order of their identificiation codes as used in table 2]

Code	Name of company	Code	Name of company
ACY	American Cyanamid Co.	LAK	Lakeway Chemicals, Inc.
ALC	Alco Chemical Corp.		
ARA	Arapahoe Chemicals, Inc. Sub/Syntex Corp. (U.S.A.)	MCB	Borg-Warner Corp., Weston Chemical Div.
		MON	Monsanto Co.
ASH	Ashland Oil, Inc., Ashland Chemical Co.		
		NEV	Neville Chemical Co.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Co. Div.	NPI	Stepan Chemical Co., Polychem Dept.
		PAS	Pennwalt Chemicals Corp.
DA	Diamond Shamrock Corp.	PIT	Pitt-Consol Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc.	PLC	Phillips Petroleum Co.
FER	Ferro Corp., Ferro Chemical Div.	RBC	Fike Chemicals, Inc.
FMN	FMC Corp., Agricultural Chemical Div.	RCD	Richardson Co., Organic Chemical Div.
		RCI	Reichhold Chemicals, Inc.
GYR	Goodyear Tire & Rubber Co.		
		SDC	Martin-Marietta Corp., Sodeyco Div.
HK	Hooker Chemicals & Plastics Corp.		
		VNC	Vanderbilt Chemical Copr.
ICI	ICI United States, Inc., Specialty Chemicals Group		

Note.--Complete names and address of the above reporting companies are listed in table 1 of the appendix.

ELASTOMERS

David B. Beck

Elastomers (synthetic rubber) are high polymeric materials with properties similar to those of natural rubber. The term "elastomers" as used in this report, means a substance, whether in bale, crumb, powder, latex, and other crude form, which can be vulcanized or similarly processed into a material that can be stretched to at least twice its original length and, after having been so stretched and the stress removed, will return with force to approximately its original length. U.S. production and sales of elastomers in 1976 are shown in table 1[1].

Total U.S. production[2] of synthetic rubber in 1976 amounted to 5,386 million pounds, an increase of 18 percent from that produced in 1975. Total sales[2] of elastomers in 1976 amounted to 3,710 million pounds, a decrease of 6 percent from that produced in 1975.

Styrene-butadiene rubber (SBR, or S-type rubber) in 1976 continued to be the elastomer produced in the greatest quantity as it has been for more than a quarter of a century. U.S. production of S-type rubber, including 30 million pounds of its vinylpyridine sub-type, amounted to 3,010 million pounds in 1976, an increase of 14 percent from that reported for 1975. Solution polymerized butadiene rubber, a stereo type elastomer, was produced domestically in 1976 in the next largest amount--752 million pounds; production of isoprene and ethylene-propylene rubbers, the other stereo types, amounted to 164 million[3] and 303 million pounds, respectively. Total U.S. production of these stereo type elastomers amounted to 1,219 million pounds in 1976--an increase of 25 percent from 1975. Other principal types of synthetic elastomers for which U.S. production data are reported separately are isobutylene-isoprene (butyl) rubber, production of which was 277 million pounds[3] in 1976, acrylonitrile-butadiene (N-type) rubber, production of which was 166 million pounds, and polychloroprene (Neoprene) rubber, production of which was 383 million pounds[3].

Sales of S-type rubber by U.S. producers in 1976 (including its vinylpyridine sub-type) amounted to 1,786 million pounds, a decrease of 18 percent from sales reported for 1975. Sales of solution polymerized butadiene rubber amounted to 413 million pounds, and those of ethylene-propylene rubber to 245 million pounds. Sales of N-type rubber in 1976 amounted to 130 million pounds. Sales of solution polymerized butadiene rubber in 1976 decreased from sales in 1975 by 12 percent, and sales of ethylene-propylene rubber increased 27 percent. Sales of N-type rubber in 1976 were 23 percent above those in 1975.

---

[1] See also Table 2 which lists these products and indicates the manufacturers of each by code. The codes are identified by company name in table 3.
[2] Does not include urethane type elastomers.
[3] Reported by the Rubber Manufacturers' Association.

Synthetic Elastomers

During 1976 the U.S. synthetic elastomers industry was hampered by 1) the United Rubber Workers (URW) strike against the Big Four tire producers, and 2) a cancer scare which set the National Institute of Occupational Safety and Health (NIOSH) and certain producers to the task of researching potential occupational hazards germane to the rubber industry. Despite these and other developments, overall production of synthetic elastomers was up from 1975, and the outlook for 1977 and beyond is favorable.

Styrene-butadiene rubber workers and leukemia

B.F. Goodrich reported in March 1976 that three employees of its Port Neches, Texas, styrene-butadiene rubber (SBR) plant had died of leukemia since 1971. A quick check by other SBR producers revealed that several other leukemia-related deaths and illnesses had similarly occurred.

NIOSH began an investigation having the same urgency as its vinyl chloride monomer study. Pinpointing the potential carcinogen in SBR is complicated, however, by the fact that SBR production involves over 200 monomers and rubber-processing chemicals. Two university studies funded by the rubber industry to research occupational diseases have been in progress since 1970, but some producers now have initiated inquiries of their own. The International Institute of Synthetic Rubber Producers (IISRP) is also concentrating a massive factfinding effort on butadiene monomers.

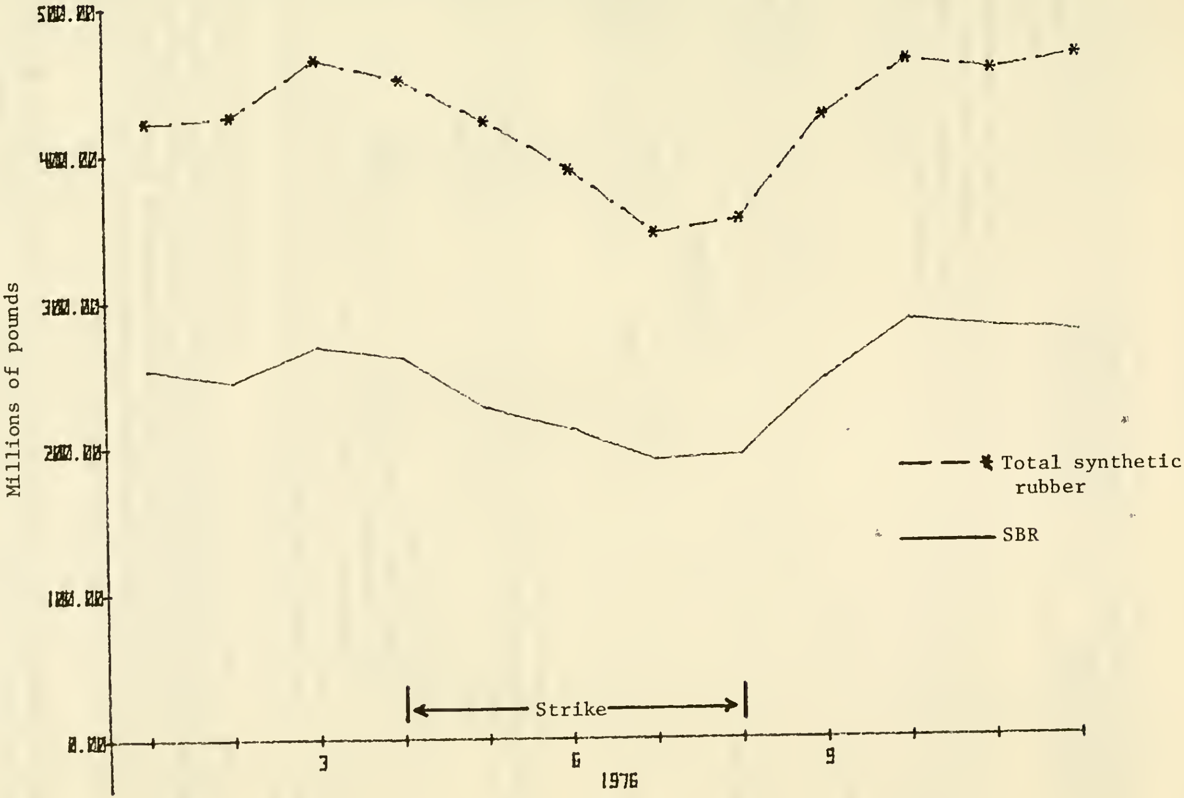
United Rubber Workers strike

Contract negotiations between the URW and the Big Four tire producers broke down in 1976, as they had in 1967, 1970, and 1973. But the 1976 URW strike was to last longer (140 days) than any previous one. The key issues were a cost-of-living escalator clause and wage differentials between tire workers and other rubber-product workers.

The effects of the strike were not immediately felt because tire inventories were initially high (55 million units compared with a normal inventory of 40 to 50 million units), and stocks of the monomers butadiene and styrene were low. Production of the monomers, SBR elastomers, and rubber-processing chemicals continued at a normal pace through April to build supply in anticipation of heavy tire production once the strike was settled.

The strike was not settled as soon as most hoped. As stocks rose, throughout May and August, SBR production dropped 12 to 26 percent (see the following figure). This triggered declines in the demand for, and in the price of, styrene and butadiene monomers.

Synthetic rubber: Monthly U.S. production of total synthetic rubber and styrene-butadiene rubber (SBR), 1976



The strike curbed what could have been a very good year for tire producers. When the strike ended in Angust, tire inventories had dropped to 20 million units, and at yearend they were about 10 million units short of normal reserves. Sales for the year generally increased 5 to 6 percent over 1975, but after-tax profits fell almost 30 percent for some companies.

While hose and belting generally rebounded from the 1975 recession, flat belt sales (serving high capital expenditure markets such as coal mining) were dampened by the length of the strike. Producers of fibers, tire yarn, and other products related to tire manufacture also reported feeling the impact of the strike.

Production and sales

Production of synthetic elastomers in 1976 amounted to 5.3 billion pounds, up almost 15 percent from 4.6 billion pounds in 1975. The following tabulation shows that all major types of elastomers made a good recovery from 1975:

Type of rubber	Production: 1975 (1,000 pounds)	Production: 1976 (1,000 pounds)	Percentage increase
SBR	2,607,907	2,980,253	14
Butyl	182,039	277,685	53
N-type	118,767	165,924	40
Polybutadiene	655,778	780,756 1/	19
Polyisoprene	135,154	164,115	21
EPDM	187,392	303,056	62
Silicone	31,221	38,974	25
Styrene-butadiene-vinylpyridine	29,500	29,832	1
Total synthetic rubber	4,578,725	5,220,956 1/	14

However, in the overall perspective, only polybutadiene and EPDM managed to exceed the 1974 levels of production.

Sales of SBR in 1976 amounted to 1,775,333 thousand pounds compared with 2,607,907 thousand pounds in 1975, or a decrease of 32 percent. Sales value of SBR declined 17 percent from $572 million in 1975 to $473 million in 1976. Similarly, production and sales of solution-polymerized polybutadiene declined 12 percent and 9 percent, respectively. Changes in sales quantities and values for other synthetic elastomers were as follows:

1/ Census data.

Type of rubber	Percentage change in sales quantity: 1976 from 1975	Percentage change in sales value: 1976 from 1975
Butyl	1/	1/
N-type	23	32
Polyisoprene	1/	1/
EPDM	27	39
Silicone	39	32
Styrene-butadiene-vinylpyridine	-35	-34

1/ Withheld to avoid disclosure of company confidential data.

Foreign trade

In synthetic elastomers, the United States maintained a favorable export/import ratio of about 2.3 in 1976 (see figure on p. 206). That ratio has varied no more than 0.3 from the average during 1972-76. However, if the quantity of natural rubber imports is included (the United States does not produce natural rubber, yet it consumes about one-fifth of the world's total, annually), the export/import ratio drops to a less favorable 0.36 for 1976 (see figure on p. 207).

The ratio of imports to consumption of synthetic rubber alone was steady at 4.7 to 5.7 percent during 1972-76. If natural rubber data are considered, the ratio of imports to consumption shows a steady (but gradual) increase from 24.8 percent in 1972 to 30.3 percent in 1976.

As the U.S. economy was depressed in 1975, so too were U.S. exports of rubber. Export problems included currency devaluations, inflation, raw materials costs, tariff barriers, and transportation costs. These factors, coupled with increased foreign competition and the prospects of little growth in U.S. tire demand, provided strong incentive for U.S. producers to expand their facilities overseas, especially in the developing countries.

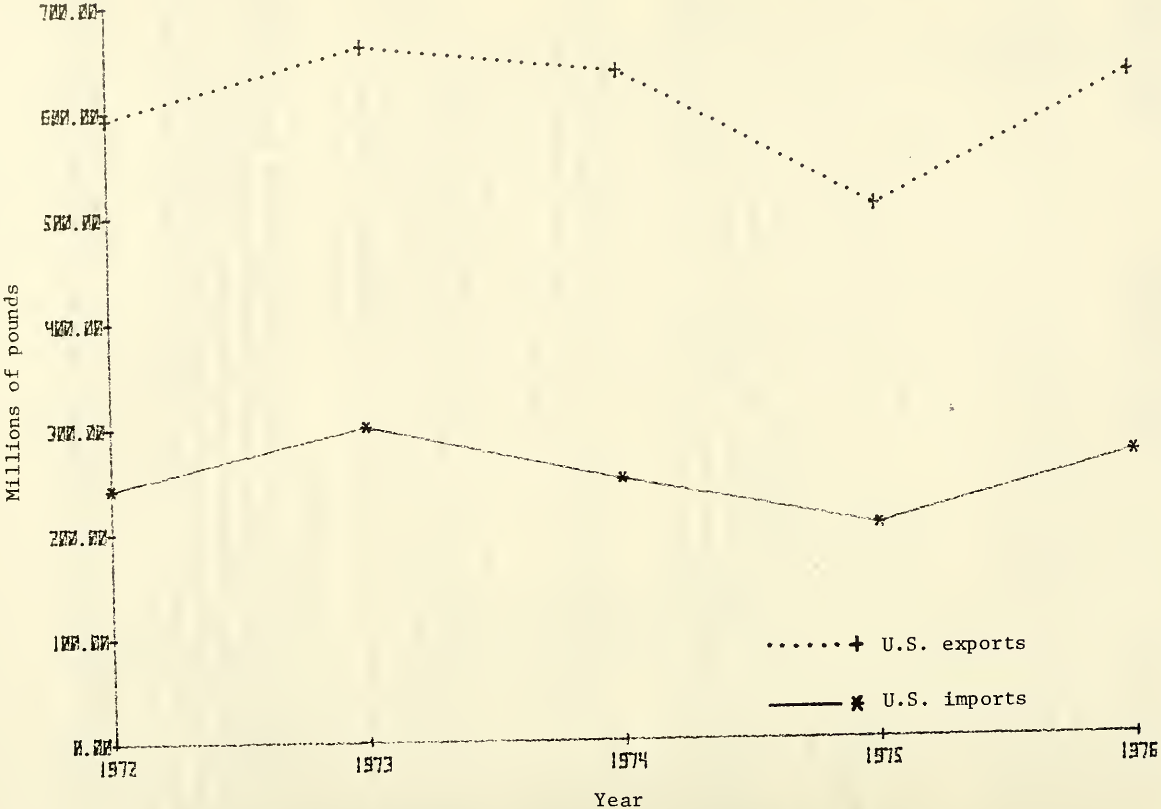
World demand and foreign competition

Latin America's automobile consumption in 1980 will be more than double that in 1970. Similarly, Southeast Asia's demand for original-equipment tires will increase at least 50 percent in the same period. Both these regions, along with the Middle East and Africa, are ripe for industrial development, which means that nontire rubber demand (especially for hose and belting) will be strong in the coming decade.

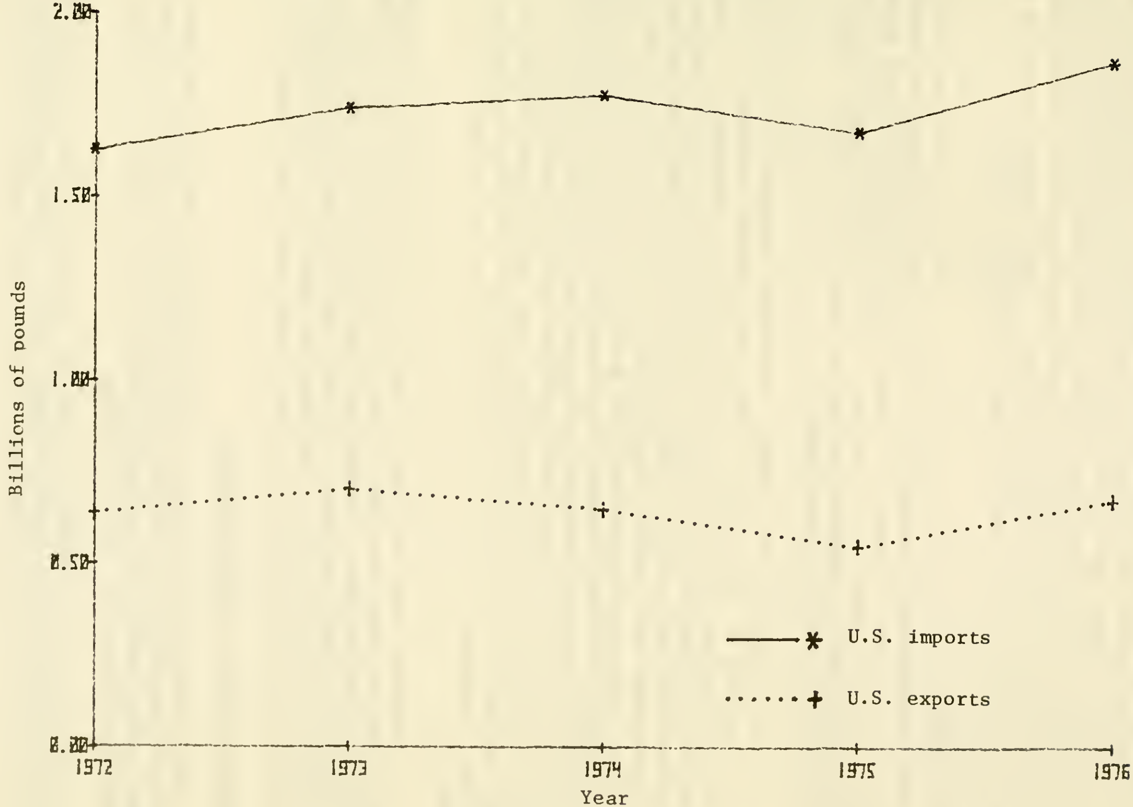
U.S. multinational rubber companies face a number of problems in meeting increasing demand overseas. The biggest question is whether expansion can

245-856 O - 77 - 14

Synthetic rubber: U.S. export quantity and U.S. import quantity, 1972-76



Synthetic and natural rubber: U.S. export quantity (including shipments of natural rubber from the U.S. Government stockpile) versus U.S. import quantity, 1972-76



occur fast enough to meet growing demand for U.S. rubber technology. Many countries which are potential sites for new plants or for the expansion of existing facilities are demanding a bigger share of the multinationals' gross receipts. Cheap labor is becoming a scarcity and raw materials costs are increasing. Foreign government red tape also tends to retard expansion of U.S. industry abroad. Meanwhile, Japan and Western Europe are constantly developing newer and better rubber know-how of their own and promise to be strong competition for U.S.-owned companies in foreign markets.

Natural rubber

U.S. consumption of natural rubber (NR) in 1976 was about 1.5 billion pounds, or 25 percent of total U.S. rubber consumption--second only to SBR. Tire production accounted for 65 percent of SBR consumption and 73 percent of NR consumption, and together the two accounted for 77 percent of total rubber consumption by the tire industry.

In years to come the fraction of tire rubber accounted for by NR will probably increase at the expense of SBR. There are two reasons: (1) New radial tread designs for passenger tires are already consuming up to twice the NR per tire used in older designs. Furthermore, the radial designs are being tested for nonpassenger tires as well. (2) Consumption of NR since World War II has been limited by supply, but higher yield agricultural techniques, commercial redevelopment of guayule as a source of NR, and a breakthrough in the battle against South American leaf blight (which wiped out the Brazilian rubber industry at the turn of the century) will contribute to increased future NR availability. World NR production is projected to rise from 3.5 million metric tons, or 32 percent of world rubber consumption, in 1976 to an estimated 10 to 12 million metric tons, or 35 to 40 percent of projected world consumption, by the end of the century.

A significant step was taken in August by the Association of Natural Rubber Producing Countries (ANRPC) toward stabilizing the erratic NR prices prevalent in recent years. Through an international buffer stock and strategic open market purchases, the ANRPC (which accounts for over 90 percent of world NR production) hopes to maintain NR supply in relative balance with demand and thereby make prices more stable and NR more competitive.

Industry outlook: 1977 and beyond

The biggest factor in rubber industry growth in 1977 will be tires. Production and sales of tires have been predicted to break all previous years' records because of increasing demand and the efforts to replenish inventories depleted by the 1976 strike.

Radial tires for automobiles (and for trucks and buses) will gain a larger percentage of the domestic market in 1977. Some producers fear that in the long run the greater mileage life of radials could put a damper on annual growth; but others agree that most Americans tend to underinflate their tires and usually realize less than half of the 50-percent extra tread life that radials allegedly offer. In any case, foreign tire sources made further inroads into the U.S. market during the 1976 strike, and U.S. producers will have an uphill battle to regain those lost sales.

Nontire synthetic elastomers will see strong growth at least through 1980. Industrial hose markets are projected to grow 5 percent per year with the upswing in production of hydraulic, offshore drilling, and mining equipment and with the recovery of the automobile industry. Rubber hose will also be used as a less expensive alternative to rigid metal piping in more and more applications.

Rubber and reinforced rubber belting have enjoyed tremendous growth since 1974. The coal industry is the major contributing factor--conveyor belting is the most efficient and economical way to handle bulk materials such as coal and other mined products. Sales of belting are expected to climb 8 to 9 percent annually through 1980.

A conservative estimate for growth of U.S. synthetic rubber consumption through 1980 would be about 3 percent annually, barring unusual economic conditions. At that rate U.S. consumption will reach 2.4 billion pounds by 1980. Total U.S. consumption of all rubber could reach over 7 billion pounds by the year 2000. This estimate allows for longrun growth of less than 3 percent, taking into account recessionary periods and other possible (temporary) negative economic influences.

TABLE 1.--Elastomers (synthetic rubber):[1] U.S. production and sales, 1976

[Listed below are all elastomers (synthetic rubber) for which reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists all elastomers for which data on production and/or sales were reported and identifies the manufacturers of each]

ELASTOMERS	PRODUCTION[2]	SALES		
		QUANTITY[2]	VALUE	UNIT VALUE[3]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	5,385,800	3,710,137	1,529,062	$0.41
Cyclic	3,146,083	1,970,636	560,386	.28
Acylcic	2,239,717	1,739,501	968,676	.56
Acrylonitrile-butadiene type (N-type)	165,924	129,560	79,663	.61
Butadiene (emulsion polymerized) type	16,312	14,101	4,858	.34
Chloroprene type (Neoprene)[4]	...	...	...	...
Isobutylene-isoprene type (Butyl)[5]	...	...	...	...
Silicone type	38,974	38,466	115,036	2.99
Stereo elastomers:				
Butadiene (solution polymerized) type	751,535	413,133	122,435	.30
Ethylene-propylene type	303,056	245,448	111,231	.45
Isoprene type[6]	...	...	...	...
Styrene-butadiene type (S-type)	2,980,253	1,775,332	473,446	.27
Styrene-butadiene-vinylpyridine type	29,832	10,567	7,308	.69
Urethane type	([7])	([7])	([7])	([7])
All other elastomers[8]	1,099,914	1,088,530	615,085	.57

[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] Includea oil content of oil-extended elastomers.

[3] Calculated from rounded figures.

[4] Included in "All other elastomers". The production of polychloroprene rubber in 1976 was reported by the Rubber Manufacturers' Association to be 164,581 metric tons (362,839,000 pounds).

[5] Included in "All other elastomers". The production of butyl rubber in 1976 was reported by the Rubber Manufacturers' Association to be 125,493 metric tons (276,662,000 pounds).

[6] Included in "All other elastomers". The production of polyisoprene rubber in 1976 was reported by the Rubber Manufacturers' Association to be 74,428 metric tons (164,084,000 pounds).

[7] The data on production and sales of urethane elastomers are reported in the section "Plastics and Resin Materials" with urethane plastics and polyols.

[8] Includes production and sales data for acrylic ester, butyl, chloroprene, epichlorohydrin, fluorinated, isobutylene, isoprenes, and polysulfide elastomers, certain solution elastomers, carboxylated SBR latex, chlorinated rubber, chlorosulfonated polyethylene, thermoplastic rubber, miscellaneous elastomers.

TABLE 2.--ELASTOMERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AND "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

ELASTOMERS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C	
BUTADIENE-STYRENE TYPE:	
@BUTADIENE-STYRENE (S-TYPE)	ASH, ASY, BFG, CPY, FIR, FRS, GNT, GRD, GYR, PLC, RCI, TUS, USR.
BUTADIENE-STYRENE-ITACONIC ACID	ASY.
@BUTADIENE-STYRENE-VINYLPYRIDINE	BFG, FIR, FRS, GNT, GYR, MIL, USR.
BUTADIENE-STYRENE TYPE ELASTOMERS, OTHER	PLC.
THERMOPLASTIC ELASTOMERS, CYCLIC	SHC.
ALL OTHER CYCLIC ELASTOMERS:	
POLYESTER ELASTOMER	DUP.
POLYISOPRENE, CYCLIZED	WAY.
A C Y C L I C	
POLYACRYLATE ESTER TYPE:	
POLYACRYLATE ESTER, TYPE ELASTOMER	ACY, BFG, DUP, TKL.
POLYALKALENE SULFIDE TYPE:	
POLYALKALENE SULFIDE, TYPE ELASTOMER	TKL.
@BUTADIENE-ACRYLONITRILE TYPE (N-TYPE):	
BUTADIENE-ACRYLONITRILE TYPE (N-TYPE)	BFG, CPY, FRS, GYR, RCI, USR.
@POLYBUTADIENE TYPE (EMULSION)	BFG, FRS, GYR, TKL, TUS.
POLYCHLOROPRENE TYPE (NEOPRENE):	
POLYCHLOROPRENE TYPE (NEOPRENE)	DUP, PTT.
POLYISOBUTYLENE TYPE:	
POLISOBUTYLENE, TYPE ELASTOMERS	ENJ.
ISOBUTYLENE-ISOPRENE TYPE (BUTYL):	
ISOBUTYLENE-ISOPRENE TYPE (BUTYL)	CBN, ENJ.

TABLE 2.--ELASTOMERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

ELASTOMERS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C Y C L I C--CONTINUED	
PRODUCTS OF NATURAL RUBBER:	
POLYMERIZED CHLORINATED RUBBERS	ICI, X.
@SILICONE TYPE:	
SILICONE TYPE ELASTOMERS	DCC, SPD, SWS.
STEREOISOMER TYPE:	
BUTADIENE-ACRYLIC ACID-ACRYLONITRILE	ASY.
@ETHYLENE-PROPYLENE RUBBER	BFG, CPY, DUP, ENJ, USR.
@POLYBUTADIENE (SOLUTION POLYMERIZED)	ASY, ATR, BFG, FRS, GNT, GYR, PLC.
POLYISOPRENE (SOLUTION POLYMERIZED)	BFG, GYR.
THERMOPLASTIC ELASTOMERS, ACYCLIC	USR.
ALL OTHER ACYCLIC ELASTOMERS:	
CHLOROSULFONATED POLYETHYLENE	DUP.
DEPOLYMERIZED NATURAL RUBBER	HDM.
DEPOLYMERIZED ISOPRENE	HDM.
EPICHLOROHYDRIN RUBBERS	BFG.
FLUORCELASTOMERS	DUP.
HEXAFLUOROPROPENE-VINYLIDENE FLUORIDE COPOLYMER (FLUOREL)	MMM.
POLYALKALENE OXIDE	PRC.

TABLE 3.--ELASTOMERS (SYNTHETIC RUBBER): DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of elastomers manufacturers that reported production or sales to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
ACY	American Cyanamid Co.
ASH	Ashland Oil, Inc.
ASY	American Synthetic Rubber Corp.
ATR	Atlantic Richfield Co.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Co. Div.
CBN	Cities Service Co., Columbian Group
CPY	Copolymer Rubber & Chemical Corp.
DCC	Dow Corning Corp.
DUP	E. I. duPont de Nemours & Co., Inc.
ENJ	Exxon Chemical Co., U.S.A.
	Firestone Tire & Rubber Co.:
FIR	Firestone Plastics Co. Div.
FRS	Firestone Synthetic Rubber & Latex Co. Div.
GNT	General Tire & Rubber Co., Chemical Div.
GRD	W. R. Grace & Co., Polymers & Chemicals Div.
GYR	Goodyear Tire & Rubber Co.
HDM	Hardman, Inc.
HPC	Hercules, Inc.
ICI	ICI United States, Inc., Specialty Chemicals Group
MIL	Milliken & Co., Milliken Chemical Div.
MMM	Minnesota Mining and Manufacturing Co.
PLC	Phillips Petroleum Co.
PRC	Products Research & Chemical Corp., Chemical and Sealant Div.
PTT	Petro-Tex Chemical Corp.
RCI	Reichhold Chemicals, Inc., Reichhold Polymers, Inc.
SHC	Shell Oil Co., Shell Chemical Co. Div.
SPD	General Electric Co., Silicone Products Dept.
SWS	Stauffer Chemical Co., SWS Silicones Div.
TKL	Thiokol Chemical Corp.
TUS	Texas-U.S. Chemical Co.
UCC	Union Carbide Corp.
USR	Uniroyal, Inc., Chemical Div.
WAY	Philip A. Hunt Chemical Corp., Wayland Chemical Div.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

PLASTICIZERS

Edmund Cappuccilli and Louis N. DeToro

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 1 presents statistics on U.S. production and sales of plasticizers in as great a detail as is possible without revealing the operations of individual producers.

U.S. production of plasticizers totaled 1,587 million pounds in 1976, an increase of 17.4 percent from the 1,352 million pounds reported for 1975. Sales of plasticizers totaled 1,466 million pounds, valued at $566 million, in 1976, compared with 1,338 million pounds, valued at $470 million, in 1975.

Production of cyclic plasticizers in 1976, which consisted chiefly of the esters of phthalic anhydride, phosphoric acid, and trimellitic acid, amounted to 1,186 million pounds, an increase of 14.2 percent from the 1,038 million pounds reported for 1975. Sales of cyclic plasticizers in 1976 totaled 1,111 million pounds, valued at $360 million, compared with 1,042 million pounds, valued at $308 million, in 1975. The most important cyclic plasticizer was di(2-ethylhexyl) phthalate, with production of 297 million pounds, in 1976.

Production of acyclic plasticizers in 1976 totaled 402 million pounds, an increase of 28.1 percent from the 313 million pounds reported for 1975. Sales of acyclic plasticizers totaled 355 million pounds, valued at $206 million, in 1976, compared with 296 million pounds, valued at $162 million, in 1975. Epoxidized soya oils were the most important acyclic plasticizer in 1976 with production of 91 million pounds.

TABLE 1.--PLASTICIZERS:[1] U.S. PRODUCTION AND SALES, 1976

[Listed below are plasticizers for which any reported data on production and/or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists separately all plasticizer chemicals for which data on production and/or sales were reported and identifies the manufacturers of each]

PLASTICIZERS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[2]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	1,587,434	1,465,711	566,265	$0.39
Benzenoid[3]	1,303,772	1,207,225	416,383	.34
Nonbenzenoid	283,662	258,486	149,882	.58
PLASTICIZERS, CYCLIC				
Total	1,185,909	1,110,869	360,453	.32
Phosphoric acid esters, total	74,866	62,159	40,502	.65
Cresyl diphenyl phosphate	4,518	3,574	2,326	.65
All other phosphoric acid esters[4]	70,348	58,585	38,176	.65
Phthalic anhydride esters, total	1,042,933	986,560	293,018	.30
Dibutyl phthalate	13,702	14,679	5,491	.37
Diethyl phthalate	16,135	11,797	4,928	.42
Diisodecyl phthalate	143,129	108,755	30,071	.28
Dimethyl phthalate	8,836	8,295	3,053	.37
Dioctyl phthalates, total	313,952	393,454	102,989	.26
Di(2-ethylhexyl) phthalate	296,739	380,293	99,266	.26
Other dioctyl phthalates	17,213	13,161	3,723	.28
Di-tridecyl phthalate	10,472	14,312	5,075	.36
n-Hexyl n-decyl phthalate	19,840	8,730	2,412	.28
All other phthalic anhydride esters	516,867	426,538	138,999	.33
Trimellitic acid esters, total	23,080	17,104	8,293	.48
Triiso-octyl trimellitate	2,499	943	463	.49
Tri-n-octyl n-decyl trimellitate	...	445	276	.62
Tri-n-octyl trimellitate	9,279	7,480	3,558	.48
All other trimellitic acid esters	11,302	8,236	3,996	.49
All other cyclic plasticizers[5]	45,030	45,046	18,640	.41
PLASTICIZERS, ACYCLIC				
Total	401,525	354,842	205,812	.58
Adipic acid esters, total	59,535	57,436	27,016	.47
Di(2-ethylhexyl) adipate	39,292	37,698	16,373	.43
Diisodecyl adipate	2,045	1,887	904	.48
n-Octyl n-decyl adipate	8,866	...	...	...
All other adipic acid esters	9,332	17,851	9,739	.55
Complex linear polyesters and polymeric plasticizers, total	52,877	41,805	29,473	.71
Adipic acid type	33,320	25,009	17,270	.69
All other	19,557	16,796	12,203	.73
Epoxidized esters, total	117,392	109,077	49,953	.46
Epoxidized linseed oils	6,361	5,750	4,117	.72
Epoxidized soya oils	91,437	83,857	36,604	.44
All other epoxidized esters	19,594	19,470	9,232	.47
Isopropyl myristate	3,366	3,065	1,595	.52

See footnotes at end of table.

TABLE 1.--PLASTICIZERS:[1] U.S. PRODUCTION AND SALES, 1976--CONTINUED

PLASTICIZERS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[2]
PLASTICIZERS, ACYCLIC--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Oleic acid esters, total	9,934	9,459	4,165	$0.44
Butyl oleate	1,772	1,751	805	.46
Methyl oleate	3,064	2,889	992	.34
Propyl oleates (including n-propyl oleate and isopropyl oleate)	570	449	165	.37
All other oleic acid esters	4,528	4,370	2,203	.50
Phosphoric acid esters	25,708	20,740	14,650	.71
Sebacic acid esters	1,705	745	878	1.18
Stearic acid esters, total	12,108	11,715	4,632	.40
n-Butyl stearate	6,708	6,700	2,278	.34
Isobutyl stearate	1,530	...	...	...
All other stearic acid esters	3,870	5,015	2,354	.47
All other acyclic plasticizers[6]	118,850	100,800	73,450	.73

[1] Includes data for compounds used principally (but not exclusively) as primary plasticizers. Does not include clearly defined extenders of secondary plasticizers.
[2] Calculated from rounded figures.
[3] Includes benzenoid products as defined in part 1 of schedule 4 of the Tariff Schedules of the United States Annotated.
[4] Includes data for dibutyl phenyl phosphate, diphenyl octyl phosphate, tricresyl phosphate and other phosphate esters.
[5] Includes data for alkylated naphthalene, glycol dibenzoates, isopropylidenediphenoxypropanol, toluenesulfonamides, tetrahydrofurfuryl oleate, and other cyclic plasticizers.
[6] Includes data for azelaic, citric and acetylcitric, myristic, palmitic, pelargonic, ricinoleic, acetylricinoleic, glyceryl, and glycol esters, and other acyclic plasticizers.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AND "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

PLASTICIZERS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C	
DIETHYLENE GLYCOL DIBENZOATE	VEL.
DIPROPANEDIOL DIBENZOATE (DIPROPYLENE GLYCOL DIBENZOATE)	VEL.
N-ETHYL-PARA-TOLUENESULFONAMIDE	MON.
ISOPROPYLIDENEDIPHENOXYPROPANOL	DOW.
@PHOSPHORIC ACID ESTERS:	
@CRESYL DIPHENYL PHOSPHATE	FMP, IMC, MON, SPS.
DIBUTYL PHENYL PHOSPHATE	FMP, MON.
DIPHENYL OCTYL PHOSPHATE	MON.
TRICRESYL PHOSPHATE	FMP, IMC, MON, SPS.
TRIPHENYL PHOSPHATE	EK, MON.
@PHTHALIC ANHYDRIDE ESTERS:	
BIS(2-ETHYLHEXYL)TEREPHTHLATE	EKT.
BUTYL BENZYL PHTHALATE	MON.
BUTYL CYCLOHEXYL PHTHALATE	CPS.
BUTYL OCTYL PHTHALATES	RCI, USS.
DI(2-BUTOXYETHYL) PHTHALATE	HAL.
@DIBUTYL PHTHALATE	BAS, EKT, GRH, MON, RCI, SW(E), UCC, USS, WTH.
DICYCLOHEXYL 2-ETHYLHEXYL PHTHALATE	GRH.
DICYCLOHEXYL PHTHALATE	MON, PFZ.
@DIETHYL PHTHALATE	EKT, KF, MON, PFZ.
DI-NORMAL-HEXYL PHTHALATE	PFZ, USS.
@DIISODECYL PHTHALATE	BAS, CO, ENJ(E), GRH, HN, MON, RCI, RUB, TEK, USS.
DIISONONYL PHTHALATE	ENJ(E).
DI(2-METHOXYETHYL) PHTHALATE	EKT.
@DIMETHYL PHTHALATE	EKT, KF, MON, PFZ, RCI, TCC.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PLASTICIZERS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@PHTHALIC ANHYDRIDE ESTERS--CONTINUED	
@DIOCTYL PHTHALATES:	
@DI(2-ETHYLHEXYL) PHTHALATE	BAS, BFG, CO, EKT, ENJ(E), GRH, HN, MON, RCI, TEK, USS.
DIISO-OCTYL PHTHALATE	RCI, USS.
ALL OTHER DIOCTYL PHTHALATES	PFZ, USS, WTH.
DIPHENYL PHTHALATE	MON.
@DI-TRIDECYL PHTHALATE	ENJ(E), GRH, HN, RCI, RUB, TEK, USS.
GLYCOL PHTHALATE ESTERS:	
BUTYL PHTHALYL BUTYL GLYCOLATE	MON.
ALL OTHER GLYCOL PHTHALATE ESTERS	HPC.
@HEXYL NORMAL-DECYL PHTHALATE	BAS, CO, GRH, HN, TEK.
HEXYL ISO-OCTYL PHTHALATE	PFZ.
NORMAL-OCTYL NORMAL-DECYL PHTHALATE	RCI, TEK, USS.
ALL OTHER PHTHALIC ANHYDRIDE ESTERS	ENJ(E), HN, MON.
TETRAHYDROFURFURYL OLEATE	EMR.
TOLUENESULFONAMIDE ORTHO-, PARA-MIXTURES	MON.
@TRIMELLITIC ACID ESTERS:	
TRI(2-ETHYLHEXYL) TRIMELLITATE	GRH, PPL.
TRI-NORMAL-HEXYL NORMAL-DECYL TRIMELLITATE	GRH, MON.
@TRIISO-OCTYL TRIMELLITATE	PFZ, RCI, RUB, USS.
@TRI-NORMAL-OCTYL NORMAL-DECYL TRIMELLITATE	PFZ, RCI, RUB.
@TRIOCTYL TRIMELLITATE	EKT, HN, RUB, USS, WTH.
ALL OTHER TRIMELLITIC ACID ESTERS	ENJ(E), PFZ, TEK, WTH, X.
ALL OTHER CYCLIC PLASTICIZERS	HN, MON, NEV.
A C Y C L I C	
@ADIPIC ACID ESTERS:	
DI(2-(2-BUTOXYETHOXY)ETHYL) ADIPATR	RCI, TKL.
@DI(2-ETHYLHEXYL) ADIPATE	BAS, DA, GRH, HAL, HN, MON, PFZ, PPL, RCI, RH, RUB, USS, WTH.
DIISOBUTYL ADIPATE	GRH, HAL.
@DIISODECYL ADIPATE	GRH, HN, PFZ, RCI, RH, RUB, USS.
DIISO-OCTYL ADIPATE	HAL, HN, RH.
DIISOPROPYL ADIPATE	SBC, VND.
DI(TRIDECYL) ADIPATE	GRH.
NORMAL-HEXYL NORMAL-DECYL ADIPATE	TEK, USS.
ISO-OCTYL ISODECYL ADIPATE	GRH.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PLASTICIZERS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C Y C L I C--CONTINUED	
@ADIPIC ACID ESTERS--CONTINUED	
@NORMAL-OCTYL NORMAL-DECYL ADIPATE	MON, RCI, RH, USS.
ALL OTHER ADIPIC ACID ESTERS	RUB, SM, TEK, WTH.
AZELAIC ACID ESTERS:	
DI(2-ETHYLHEXYL) AZELATE	EKT, EMR, HAL, PFZ, RCI.
DIISO-OCTYL AZELATE	EMR.
ALL OTHER AZELAIC ACID ESTERS	EMR, HAL, PFZ.
CITRIC AND ACETYLCITRIC ACID ESTERS:	
TRIBUTYL ACETYLCITRATE	PFZ.
TRIBUTYL CITRATE	PFZ.
TRIETHYL CITRATE	PFZ.
ALL OTHER CITRIC AND ACETYLCITRIC ACID ESTERS	ICI, PFZ.
@COMPLEX LINEAR POLYESTERS AND POLYMERIC PLASTICIZERS:	
@ADIPIC ACID TYPE COMPLEX LINEAR POLYESTERS AND POLYMERIC PLASTICIZERS	ASH, GRH, HAL, PFZ, RH, TEK, WTH.
ALL OTHER COMPLEX LINEAR POLYESTERS AND POLYMERIC PLASTICIZERS	EKX, EMR, HAL, HN, MON, RCI, RH.
DI(2-(2-BUTOXYETHOXY)ETHYL) METHANE	TKL.
@EPOXIDIZED ESTERS:	
BUTYL EPOXYSTEARATES	UCC, WTC.
@EPOXIDIZED LINSEED OILS	ASH, SWT, VIK, WTC.
@EPOXIDIZED SOYA OILS	ASH, PMP, RH, UCC, VIK, WTC.
2-ETHYLHEXYL EPOXYTALLATES	UCC.
METHYL EPOXYSTEARATE	VIK.
OCTYL EPOXYSTEARATES	WTC.
OCTYL EPOXYTALLATES	RH, WTC.
ALL OTHER EPOXIDIZED ESTERS	RH, UCC.
GLYCERYL TRIPROPIONATE	EKT.
LAURIC ACID ESTERS:	
ALL OTHER LAURIC ACID ESTERS	HAL.
MYRISTIC ACID ESTERS:	
@ISOPROPYL MYRISTATE	ARC, TCH, WM, WTH.
ALL OTHER MYRISTIC ACID ESTERS	SCP, WTH.
@OLEIC ACID ESTERS:	
@BUTYL OLEATE	ARC, EMR, GRO, HAL, WM, WTH.
DECYL OLEATE	SCP, VND.
GLYCERYL TRIOLEATE (TRIOLEIN)	EMR, GLY, GRO, TCH.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PLASTICIZERS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C Y C L I C--CONTINUED	
@OLEIC ACID ESTERS--CONTINUED	
ISOBUTYL OLEATE	DA.
@METHYL OLEATE	EFH, EMR, GRO, HUM, TCH.
@PROPYL OLEATES:	
ISOPROPYL OLEATE	EMR, SCP, WM.
NORMAL-PROPYL OLEATE	CHL, EMR, GRO, TCH, WM.
ALL OTHER OLEIC ACID ESTERS	EMR, HAL, RH, SBC.
PALMITIC ACID ESTERS:	
2-ETHYLHEXYL PALMITATE	VND, WTH.
ISOPROPYL PALMITATE	ARC, TCH, WM, WTH.
ALL OTHER PALMITIC ACID ESTERS	SCP.
PELARGONIC ACID ESTERS:	
DIETHYLENE GLYCOL DIPELARGONATE (DIETHYLENE GLYCOL DINONANOATE)	EMR.
GLYCOL PELARGONATE	EMR.
ISODECYL PELARGONATE	EMR.
NEOPENTYL GLYCOL 2-ETHYL HEXANOL POLYESTER	EKT.
@PHOSPHORIC ACID ESTERS:	
TRI(2-BUTOXYETHYL) PHOSPHATE	FMP.
TRIBUTYL PHOSPHATE	MON.
TRIETHYL PHOSPHATE	EKT.
TRIOCTYL PHOSPHATE	HN, UCC.
ALL OTHER PHOSPHORIC ACID ESTERS	SFS.
RICINOLEIC AND ACETYLRICINOLEIC ACID ESTERS:	
NORMAL-BUTYL ACETYLRICINOLEATE	NTL.
BUTYL RICINOLEATE	NTL.
GLYCERYL MONORICINOLEATE	NTL.
GLYCERYL TRI(ACETYLRICINOLEATE)	NTL.
METHYL ACETYLRICINOLEATE	NTL.
METHYL RICINOLEATE	NTL, TCH.
ALL OTHER RICINOLEIC AND ACETYLRICINOLEIC ACID ESTERS	RH, TKL.
@SEBACIC ACID ESTERS:	
DIBUTOXYETHYL SEBACATE	HAL.
DIBUTYL SEBACATE	EKT, RH.
DI(2-ETHYLHEXYL) SEBACATE	GRH, RH.
DIISO-OCTYL SEBACATE	DA.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PLASTICIZERS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C Y C L I C--CONTINUED	
@STEARIC ACID ESTERS:	
@NORMAL-BUTYL STEARATE	ARC, ASH, CHL, EMR, GRO, TCH, WM, WTH.
DIMETHYLAMMONIUM STEARATE	RH.
2-ETHYLHEXYL STEARATE	SCP.
GLYCERYL TRIACETYL STEARATE	NTL.
HEXADECYL STEARATE	DA, WM.
@ISOBUTYL STEARATE	DA, EMR, WM, WTH.
ISOPROPYL STEARATE	WTH.
ALL OTHER STEARIC ACID ESTERS	ARC, SBC, SCP, TCH, WM, WTH.
SUCROSE ACETATE ISOBUTYRATE	ARC, EKT.
TRIETHYLENE GLYCOL DI(CAPRYLATE-CAPRATE)	HAL, PVO, RUB, WM.
TRIETHYLENE GLYCOL DI(2-ETHYLBUTYRATE)	UCC.
2,2,4-TRIMETHYL-1,3-PENTANEDIOL DIISOBUTYRATE	EKX.
ALL OTHER ACYCLIC PLASTICIZERS	ARC, EMR, PVO, SM, TCH, UCC, WM, WTH, X.

TABLE 3.--PLASTICIZERS: DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of plasticizers to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company	Code	Name of Company
ACC	Amoco Chemicals Corp.	NEV	Neville Chemical Co.
ARC	Armak Co.	NTL	NL Industries, Inc.
ASH	Ashland Oil, Inc., Ashland Chemical Co.		
		ORO	Chevron Chemical Co.
BAS	BASF Wyandotte Corp.		
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Co. Div.	PFZ	Pfizer, Inc.
		PPL	Pioneer Plastics Div. of LOF Plastics, Inc.
CCA	Interstab Chemical, Inc.	PVO	PVO International, Inc.
CHL	Chemol, Inc.		
CO	Continental Oil Co.	RCI	Reichhold Chemicals, Inc.
CPS	CPS Chemical Co.	RH	Rohm & Haas Co.
		RUB	Hooker Chemical Corp., Ruco Div.
DA	Diamond Shamrock Corp.		
DOW	Dow Chemical Co.	SBC	Scher Brothers, Inc.
		SCP	Henkel, Inc.
EFH	E. F. Houghton & Co.	SFS	Stauffer Chemical Co., Specialty Chemical Div.
EK	Eastman Kodak Co.:		
EKT	Tennessee Eastman Co. Div.	SM	Mobil Oil Corp., Mobil Chemical Co. Div., Chemical Coatings Div.
EKX	Texas Eastman Co. Div.		
EMR	Emery Industries, Inc.	SW	Sherwin-Williams Co.
ENJ	Exxon Chemical Co. U.S.A.	SWT	Unitech Chemical, Inc.
FMP	FMC Corp., Industrial Chemical Div.	TCC	Tanatex Chemical Corp.
GLY	Glyco Chemicals, Inc.	TCH	Emory Industries, Inc., Trylon Div.
GRH	W. R. Grace & Co., Hatco Chemical Div.	TEK	Teknor Apex Co.
GRO	A. Gross & Co., Millmaster Onyx Group, a Kewanee Industry	TKL	Thiokol Chemical Corp.
		UCC	Union Carbide Corp.
HAL	C. P. Hall Co.	USS	USS Chemicals Div. of U.S. Steel Corp.
HN	Tenneco Chemicals, Inc.		
HPC	Hercules, Inc.	VEL	Velsicol Chemical Corp.
HUM	Kraftco Corp., Humko Plastics Div.	VIK	Viking Chemical Co.
		VND	Van Dyk & Co., Inc.
ICI	ICI United States, Inc., Specialty Chemicals Group	WM	Inolex Corp.
IMC	IMC Chemical Group, Inc.	WTC	Witco Chemical Co., Inc.
		WTH	Union Camp Corp., Chemical Div., Dover Plant
KF	Kay-Fries Chemicals, Inc.		
MON	Monsanto Co.		

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

SURFACE-ACTIVE AGENTS

Edmund Cappuccilli

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 are grouped by ionic class and by chemical class and subclass. All quantities are reported in terms of 100-percent organic surface-active ingredient 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.

Total U.S. production of surface-active agents in 1976 amounted to 4,582 million pounds, or 5.4 percent greater than the 4,349 million pounds reported for 1975. Sales of bulk surface-active agents in 1976 amounted to 2,512 million pounds, valued at $821 million, compared with sales in 1975 of 2,182 million pounds, valued at $717 million. In terms of quantity, sales in 1976 were 15.2 percent greater than in 1975; in terms of value, sales in 1976 were 14.5 percent greater than in 1975.

Production of anionic surface-active agents in 1976 amounted to 3,356 million pounds, or 73.2 percent of the total output reported for 1976. Sales of anionics in 1976 amounted to 1,440 million pounds valued at $317 million.

Production of cationic surface-active agents in 1976 amounted to 252 million pounds, 11.9 percent greater than the 226 million pounds reported in 1975. Nonionic surface-active agents, however, continued to decline in production as only 957 million pounds were reported in 1976; 8.6 percent less than the 1,047 million pounds reported in 1975. Sales in both classes, however, showed increases over 1975. In terms of value, sales increased 12.0 percent for cationic surface-active agents and 17.2 percent for nonionic surface-active agents.

The difference between production and sales reflects inventory changes and captive consumption of soaps and 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.

Surfactants

Although many analysts expected the surfactant industry to improve significantly in 1976, production increased by only 5 percent to 4.6 billion pounds. Sales of surface-active agents, however, increased by 15 percent over the 1975 figures to 2.5 billion pounds. The value of sales for 1976 also increased by 15 percent while, the average unit value remained at $0.33.

The somewhat disappointing production figures are probably the result of a decrease in consumer demand in 1975 and the buildup of excess inventories which were liquidated in 1976. Some companies also reported a decrease in production in the fourth quarter of 1976 due to severe weather which curtailed production at some plants. This combination of factors, which made 1976 unique in the surfactant industry, are not expected to recur.

Several factors will affect the surfactant industry, and in particular the synthetic detergent industry, for the next several years. Some of the more important ones are the establishment of new markets, environmental or governmental controls, and the introduction of new surfactants into the market.

New markets may occur in the petroleum industry where the high price of crude oil justifies employment of new methods to increase production from old oil fields. Large amounts of sulfonated surfactants and cosurfactants such as ethoxylated alcohols will be employed for a promising process known as micellar flooding of old wells. Approximately 5 to 8 pounds of sulfonates and 1 pound of cosurfactant will be needed to recover one barrel of oil using this method. It has been estimated that between 30 and 40 billion barrels of oil can be recovered by micellar flooding.

Governmental controls on surfactant-containing products will probably increase over the next few years as consumers and Government officials become more aware of the potential hazard of certain products either to the consumer of the environment. The surfactant industry will thus be required to spend more time and research on the potential hazards of new products long before they reach the consumer market. The increased amount of time and research required for new products may cause some existing formulations, which have yet to be marketed, to be modified or terminated because of the increased cost. As a result, the surfactant producers will probably emphasize more research on the development of cheaper processes for existing major surfactants which have been proven to be consumer and environmentally safe. This decrease in basic research on surfactants should lead to fewer new products being introduced in the next several years.

Synthetic detergents

One of the main factors affecting the future of synthetic detergent formulations is the degree of restrictions placed by the U.S. Government on phosphate content. Recent pressure by environmentalists and consumer groups has resulted in legislation being drafted to effectively ban phosphate-containing detergents in eight States bordering the Great Lakes. If this legislation becomes law, the detergent producers must either reformulate their products to conform with the new restrictions or introduce entirely new products for these States.

Because of the trend away from phosphates in detergents, the heavy-duty liquid detergents, which contain no phosphates, have come into prominence in the past few years. The following is a typical heavy-duty nonphosphate liquid detergent formulation (in percent):

Anionic surfactant (linear alkylbenzenesulfonate	10
Nonionic surfactant (alcohol ethoxylate)	35
Ethanol	10
Triethanolamine	5
Water	35
Miscellaneous	5

As can be seen by this information, approximately 45 percent of the detergent is composed of surface-active agents, chiefly alcohol ethoxylates. This development began about 1965 and has been responsible for the fast growth in the production of alcohol ethoxylates, as follows (in millions of pounds): 1/

	Linear alcohol ethoxylates	Dodecylbenzene sulfonates
1965	190	565
1970	328	561
1975	506	520
1976	540	538

The growth in the use of the alcohol ethoxylates should continue as phosphates are phased out of heavy-duty powder detergents.

Another boost for the (higher-priced) alcohol ethoxylates came after the Arab oil embargo when the prices of raw materials for the benzene sulfonates increased at a faster rate than those for the alcohol ethoxylates. This advantage has now run its course; future price increases may actually favor the benzene sulfonates.

Foreign trade and industry

Imports of surfactants and, in particular, synthetic detergent formulations have generally not been increasing substantially during the past few years.

1/ From U.S. International Trade Commission publications.

In 1975, imports of synthetic detergents (TSUS items 405.35 and 466.30) reached their highest level with 5.7 million pounds. However, in the following year, 1976, imports dropped to 5.0 million pounds. This trend seems likely to continue well into 1977.

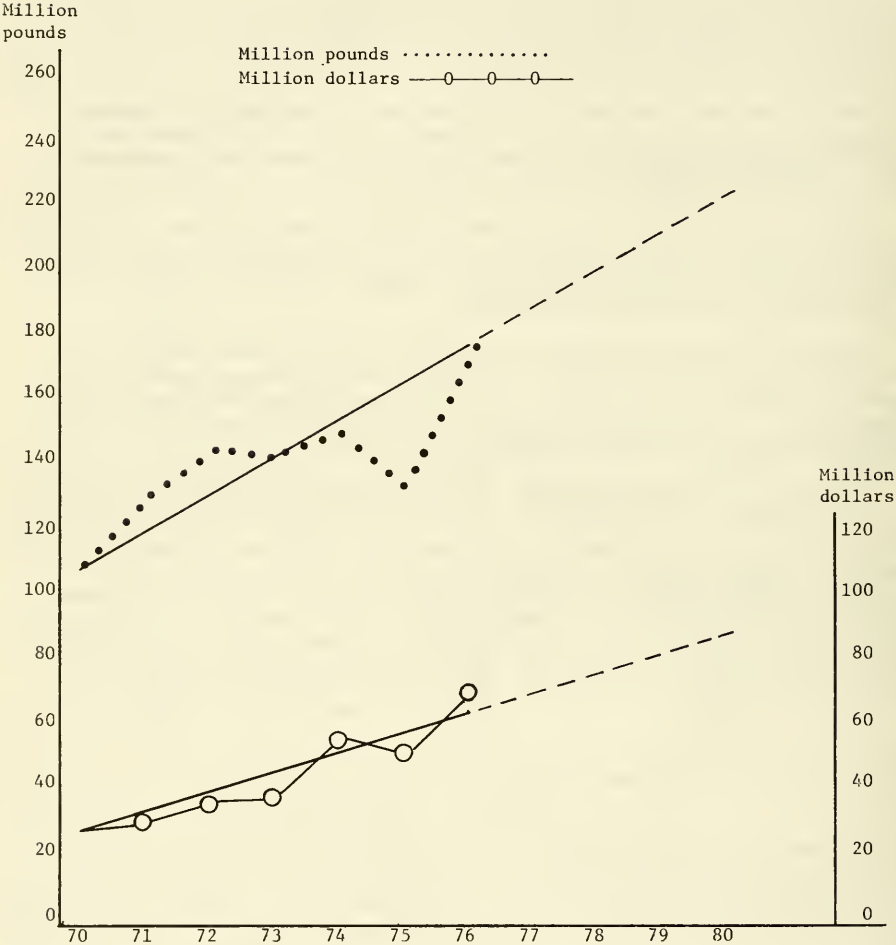
One of the main reasons for this decline is that the U.S. industry supplies virtually all the U.S. market demand at strongly competitive prices. Even in the peak import year, 1975, the import-to-consumption ratio was only 1 percent.

The level of imports is expected to remain in the range of 4 to 7 million pounds for the next several years. Any increase in imports would probably be due to an increased demand for specialty products and not to an increase in overall domestic demand.

Exports, on the other hand, have been increasing over the past few years at approximately 25 percent per year. The following chart projects exports to 1980. The projection is based on the expected increased costs of raw materials, fuel, transportation, wages, and the increasing production of detergents by foreign industries.

Japan is one country that has recovered quite rapidly from the recent economic recession. Their total production and exports of synthetic detergents for 1977 are expected to exceed their previous alltime high production level. Similar situations exist in other major exporting countries, possibly causing increasing competition for the world markets in synthetic detergents in the coming years. These factors are responsible for the expectation that export growth through 1980 will be in the range of 7 to 10 percent per year rather than the 25 percent-per-year level of the recent past.

SYNTHETIC DETERGENTS: 1/ U.S. EXPORTS, 1970-80



1/ Schedule B numbers 555.2020, 554.2022, 554.2024, and 554.2026 (data are partially estimated).

Source: Official statistics of the U.S. Department of Commerce.

SURFACE-ACTIVE AGENTS

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1976

[Listed below are all surface-active agents for which reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists all surface-active agents for which data on production and/or sales were reported and identifies the manufacturers of each]

SURFACE-ACTIVE AGENTS	PRODUCTION[1]	SALES[2] QUANTITY[1]	SALES[2] VALUE	SALES[2] UNIT VALUE[3]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*per pound*
Grand total	4,582,398	2,512,085	821,240	$0.33
Benzenoid[4]	1,018,889	475,386	201,571	.42
Nonbenzenoid[5]	3,563,509	2,036,699	619,669	.30
AMPHOTERIC SURFACE-ACTIVE AGENTS				
Total	17,506	17,369	19,641	1.13
Anionic Surface-Active Agents				
Total	3,355,799	1,440,067	316,555	.22
Carboxylic acids (and salts thereof), total	820,941	146,108	53,789	.37
Amine salts of fatty, rosin, and tall acids	1,035	439	404	.92
Carboxylic acids having amide, ester, or ether linkages	5,429	4,579	4,270	.93
Potassium and sodium salts of fatty, rosin, and tall acids, total	814,477	141,090	49,115	.35
Coconut oil acids, potassium salt	8,861	1,272	722	.85
Coconut oil acids, sodium salt	151,853	1,619	646	.40
Corn oil acids, potassium salt	186	203	132	.65
Mixed vegetable oil acids, potassium salt	3,999	3,704	4,364	1.18
Oleic acid, potassium salt	2,140	187	80	.43
Oleic acid, sodium salt	675	275	152	.55
Tall oil acids, potassium and sodium salts	8,838	5,323	2,605	.49
Tallow acids, sodium salt	353,397	20,296	5,392	.27
All other	284,528	108,211	35,022	.32
Phosphoric and polyphosphoric acid esters (and salts thereof), total	31,975	19,124	13,974	.73
Alcohols and phenols, ethoxylated and phosphated, total	24,309	13,128	9,345	.71
Mixed linear alcohols, ethoxylated and phosphated	3,597	3,149	2,408	.76
Nonylphenol, ethoxylated and phosphated	10,660	4,451	2,922	.66
Tridecyl alcohol, ethoxylated and phosphated	516	365	284	.78
All other	9,536	5,163	3,731	.72
Alcohols, phosphated or polyphosphated	7,666	5,996	4,629	.77
Sulfonic acids (and salts thereof), total	1,942,049	1,028,352	153,485	.15
Alkylbenzenesulfonates, total	647,951	173,854	63,079	.36
Dodecylbenzenesulfonic acid	147,789	75,765	22,069	.29
Dodecylbenzenesulfonic acid, calcium salt	7,490	10,229	7,477	.73
Dodecylbenzenesulfonic acid, isopropylamine salt	3,676	3,851	2,217	.58
Dodecylbenzenesulfonic acid, sodium salt	327,451	46,288	15,363	.33
Dodecylbenzenesulfonic acid, triethanolamine salt	3,358	3,666	1,505	.41
All other	158,187	34,055	14,448	.42
Benzene-, cumene-, toluene-, and xylenesulfonates, total	65,822	50,038	12,527	.25
Toluenesulfonic acid, potassium and sodium salts	20,473	...	...	...
Xylenesulfonic acid, ammonium salt	5,347	5,130	1,404	.27
Xylenesulfonic acid, sodium salt	34,602	23,725	6,055	.26
All other	5,400	21,183	5,068	.24
Ligninsulfonates, total	1,109,760	754,807	36,965	.05
Ligninsulfonic acid, calcium salt	532,299	515,319	15,757	.03

See footnotes at end of table.

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	PRODUCTION[1]	SALES[2] QUANTITY[1]	SALES[2] VALUE	SALES[2] UNIT VALUE[3]
Anionic Surface-Active Agents--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*per pound*
Sulfonic acids (and salts thereof)--Continued				
Ligninsulfonates--Continued				
Ligninsulfonic acid, sodium salt	88,494	89,285	11,477	$0.13
All other	488,967	150,203	9,731	.06
Naphthalenesulfonates	8,051	6,782	3,972	.59
Sulfonic acids having amide linkages, total	4,607	2,241	2,855	1.27
Sulfosuccinic acid derivatives	1,697	1,339	1,434	1.07
Taurine derivatives	2,910	902	1,421	1.58
Sulfonic acids having ester or ether linkages, total	77,163	26,292	28,919	1.10
Sulfosuccinic acid esters, total	14,394	12,180	12,167	1.00
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	11,855	10,269	10,491	1.02
All other	2,539	1,911	1,676	.88
Other sulfonic acids having ester or ether linkages	62,769	14,112	16,752	1.19
All other sulfonic acids	28,695	14,338	5,168	.36
Sulfuric acid esters (and salts thereof), total	...	234,938	90,962	.39
Acids, amides, and esters, sulfated, total	17,352	13,269	5,889	.44
Esters of sulfated oleic acid, total	4,970	5,013	3,035	.61
Butyl oleate, sulfated, sodium salt	1,713	1,706	701	.41
Propyl oleate, sulfated, sodium salt	515	510	289	.57
All other	2,742	2,797	2,045	.73
Oleic acid, sulfated, disodium salt	5,548	5,405	1,838	.34
Other acids, amides, and esters, sulfated	6,834	2,851	1,016	.36
Alcohols, sulfated, total	...	38,504	29,939	.78
Dodecyl sulfate salts, total	55,948	29,803	23,574	.79
Dodecyl sulfate, ammonium salt	14,234	6,032	4,190	.69
Dodecyl sulfate, magnesium salt	322	310	339	1.10
Dodecyl sulfate, sodium salt	17,593	16,471	12,444	.76
Dodecyl sulfate, triethanolamine salt	5,555	4,862	3,638	.75
All other	18,244	2,128	2,963	1.39
Mixed Linear alcohols, sulfated, ammonium salt	...	1,163	746	.64
Other alcohols, sulfated	...	7,538	5,619	.75
Ethers, sulfated, total	294,307	161,646	48,486	.30
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	11,962	11,657	8,404	.72
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	144,167	...	...	...
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	120,371	24,312	7,504	.31
All other	17,807	125,677	32,578	.26
Natural fats and oils, sulfated, total	23,595	21,519	6,648	.31
Castor oil, sulfated, sodium salt	4,986	4,255	2,008	.47
Cod oil, sulfated, sodium salt	1,910	1,849	402	.22
Neat's-foot oil, sulfated, sodium salt	2,120	1,581	535	.34
Soybean oil, sulfated, sodium salt	656	638	207	.32
Sperm oil, sulfated, sodium salt	187	188	75	.40
Tallow, sulfated, sodium salt	5,641	5,430	1,162	.21
All other	8,095	7,578	2,259	.30
Other anionic surface-active agents[6]	169,632	11,545	4,345	.38
Cationic surface-Active Agents				
Total	252,326	177,928	122,952	.69
Amine Oxides and oxygen-containing amines (except those having amide linkages), total	68,752	16,123	12,590	.78
Acyclic, total	63,989	13,111	10,019	.76
(Tallow alkyl)amine, ethoxylated	2,410	2,490	1,661	.67
All other	61,579	10,621	8,358	.79
Cyclic (including imidazoline and oxazoline derivatives), total	4,763	3,012	2,571	.85

See footnotes at end of table.

SURFACE-ACTIVE AGENTS

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	PRODUCTION[1]	SALES[2] QUANTITY[1]	VALUE	UNIT VALUE[3]
Cationic surface-Active Agents--Continued				
Amine oxides and oxygen-containing amines (except those having amide linkages)--Continued				
Cyclic (including imidazoline and oxazoline derivatives)--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	844	420	312	$0.74
All other	3,919	2,592	2,259	.87
Amines and amine oxides having amide linkages, total	21,353	20,643	16,136	.78
Carboxylic acid - diamine and polyamine condensates, total	19,167	18,865	14,116	.75
Tall oil acids - diethylenetriamine and polyalkylenepolyamine condensates	11,273	11,276	6,618	.59
All other	7,894	7,589	7,498	.99
Other amines and amine oxides having amide linkages	2,186	1,778	2,020	1.14
Amines, not containing oxygen (and salts thereof), total	65,189	51,809	32,473	.63
Diamines and polyamines, total	20,079	16,961	9,706	.57
Imidazoline derivatives	1,927	351	430	1.23
N-(9-Octadecenyl)trimethylenediamine	2,787	2,630	1,587	.60
All other	15,365	13,980	7,689	.55
Primary monoamines, total	19,230	19,172	11,945	.62
(Hydrogenated tallow alkyl)amine	2,177	2,366	1,303	.55
(Tallow alkyl)amine	3,616	...	...	...
All other	13,437	16,806	10,642	.63
Secondary and tertiary monoamines, total	25,880	15,676	10,822	.69
N,N-Dimethyl(mixed alkyl)amine	3,939	4,120	2,873	.70
All other	21,941	11,556	7,949	.69
Oxygen-containing quaternary ammonium salts	15,088	12,156	8,918	.73
Quaternary ammonium salts, not containing oxygen, total	81,944	77,197	52,835	.69
Acyclic, total	64,466	62,041	30,213	.49
Bis(hydrogenated tallow alkyl)dimethyl ammonium chloride	43,087	41,805	16,996	.41
Trimethyl(tallow alkyl)ammonium chloride	1,467	...	...	...
All other	19,912	20,236	13,217	.65
Benzenoid, total	17,478	15,156	22,622	1.49
Benzyl (coconut oil alkyl)dimethylammonium chloride	272	184	191	1.04
Benzyldimethyl(mixed alkyl)ammonium chloride	8,438	7,909	11,023	1.39
Benzyldimethyloctadecylammonium chloride	1,940	...	...	...
All other	6,828	7,063	11,408	1.62
Nonionic Surface-Active Agents				
Total	956,767	876,721	362,092	.41
Carboxylic acid amides, total	78,168	51,953	27,074	.52
Diethanolamine condensates (amine/acid ratio=2/1), total	21,259	16,197	8,478	.52
Coconut oil acids	11,133	9,305	4,814	.52
Coconut oil and tallow acids	2,432	2,027	899	.44
Linoleic acid	190	188	192	1.02
Lauric acid	335	206	140	.68
Oleic acid	1,114	934	468	.50
Stearic acid	266	227	161	.71
Tall oil acids	243	...	...	...
All other	5,546	3,310	1,804	.55
Diethanolamine condensates (other amine/acid ratios), total	33,434	28,569	14,872	.52
Coconut oil acids (amine/acid ratio=1/1)	19,163	18,443	9,294	.50

See footnotes at end of table.

SYNTHETIC ORGANIC CHEMICALS, 1976

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	PRODUCTION[1]	SALES[2] QUANTITY[1]	SALES[2] VALUE	SALES[2] UNIT VALUE[3]
Nonionic Surface-Active Agents--Continued				
Carboxylic acid amides--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*per pound*
Diethanolamine condensates (other amino/acid ratios)--Continued				
Lauric acid (amine/acid ratio=1/1)	8,493	5,467	3,127	$0.57
Stearic acid (amine/acid ratio=1/1)	546	505	344	.68
All other	5,232	4,154	2,107	.51
All other carboxylic acid amides	23,475	7,187	3,724	.52
Carboxylic acid esters, total	222,480	182,136	105,397	.58
Anhydrosorbitol esters	26,413	15,559	10,715	.69
Diethylene glycol esters, total	1,377	1,298	755	.58
Diethylene glycol distearate	474	407	254	.63
Diethylene glycol monostearate	258	245	141	.58
All other	645	646	360	.56
Ethoxylated anhydrosorbitol esters, total	26,917	25,661	15,970	.62
Ethoxylated anhydrosorbitol monostearate	8,436	8,265	4,821	.58
Ethoxylated anhydrosorbitol monoleate	5,029	4,955	3,365	.68
All other	13,452	12,441	7,784	.62
Ethylene glycol esters	3,064	2,961	1,409	.48
Glycerol esters, total	85,583	74,939	38,783	.52
Complex glycerol esters	2,362	2,578	1,824	.71
Glycerol esters of chemically defined acids, total	26,000	25,562	12,011	.47
Glycerol monolaurate	60	61	53	.87
Glycerol mono-oleate	3,767	3,822	2,489	.65
Glycerol monostearate	21,427	20,903	8,662	.41
All other	746	776	807	1.04
Glycerol esters of mixed acids, total	57,221	46,799	24,948	.53
Glycerol monoester of hydrogenated cottonseed oil acids	2,842	...	...	...
Glycerol monoester of coconut oil acids	195	195	146	.74
Glycerol monoester of hydrogenated soybean oil acids	8,470	6,712	3,956	.59
Glycerol monoester of lard acids	3,016	2,010	1,037	.52
All other	42,698	37,882	19,809	.52
Natural fats and oils, alkoxylated, total	13,863	12,011	6,124	.51
Castor oil, ethoxylated	8,132	6,710	3,729	.56
Lanolin, ethoxylated	1,375	1,105	570	.52
All other	4,356	4,196	1,825	.43
Polyethylene glycol esters, total	42,421	32,954	16,729	.51
Polyethylene glycol esters of chemically defined acids, total	23,478	18,676	12,047	.65
Polyethylene glycol dilaurate	994	969	684	.71
Polyethylene glycol dioleate	3,216	1,301	811	.62
Polyethylene glycol distearate	3,571	3,430	2,117	.62
Polyethylene glycol monolaurate	3,579	3,480	2,288	.66
Polyethylene glycol mono-oleate	2,525	2,022	1,116	.55
Polyethylene glycol monostearate	8,176	6,232	4,212	.68
All other	1,417	1,242	819	.66
Polyethylene glycol esters of mixed acids	18,943	14,278	4,682	.33
Propanediol esters, total	4,053	3,362	2,365	.70
1,2-Propanediol monolaurate	24	25	30	1.19
1,2-Propanediol monostearate	2,850	3,001	1,940	.65
All other	1,179	336	395	1.18
Other carboxylic acid esters[7]	18,789	13,391	12,547	.94
Ethers, total	652,833	639,712	226,083	.35
Benzenoid ethers, total	232,796	201,525	80,893	.40
Dodecylphenol, ethoxylated	13,072	13,914	4,425	.32
Nonylphenol, ethoxylated	134,126	125,356	44,831	.36
Phenol, ethoxylated	2,735	1,975	962	.49
All other	82,863	60,280	30,675	.51
Nonbenzenoid ethers, total	420,037	438,187	145,190	.33
Linear alcohols, alkoxylated, total	354,046	386,263	118,127	.31
Decyl Alcohol, ethoxylated	1,831	1,047	517	.49
Dodecyl alcohol, ethoxylated	3,571	2,957	1,983	.67

See footnotes at end of table.

SURFACE-ACTIVE AGENTS

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	PRODUCTION[1]	SALES		
		QUANTITY[1]	VALUE	UNIT VALUE[3]
Nonionic Surface-Active Agents--Continued				
Ethers--Continued	*1,000 pound*	*1,000 pound*	*1,000 dollars*	*Per pound*
Nonbenzenoid ethers--Continued				
Linear alcohols, alkoxylated--Continued				
Hexadecyl alcohol, ethoxylated	651	761	666	$0.87
Mixed linear alcohols, ethoxylated	228,282	363,235	105,674	.29
Mixed linear alcohols, ethoxylated and propoxylated	17,441	14,281	6,080	.43
9-Octadecenyl alcohol, ethoxylated	944	763	607	.79
Octadecyl alcohol, ethoxylated	1,759	894	953	1.07
All other	99,567	2,325	1,647	.64
Other ethers and thioethers, total	65,991	51,924	27,063	.52
Tridecyl alcohol, ethoxylated	8,188	7,111	3,871	.54
All other	57,803	44,813	23,192	.52
Other nonionic surface-active agents	3,286	2,920	3,538	1.21

[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 rounded 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] Includes ligninsulfonates.
[6] Includes production of "all other" sulfated alcohols and other acids, amides, and esters, sulfated.
[7] Includes ethoxylated sorbitol esters, polyglycerol esters, and miscellaneous esters.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AND "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A M P H O T E R I C	
1,1-BIS(CARBOXYETHYL)-2-UNDECYL-IMIDAZOLINE, SODIUM SALT	MOA.
1,1-BIS(CARBOXYMETHYL)-2-UNDECYL-2-IMIDAZOLINIUM CHLORIDE, DISODIUM SALT	SCP.
1,1-BIS(CARBOXYMETHYL)-2-UNDECYL-2-IMIDAZOLINIUM HYDROXIDE, DISODIUM SALT	BRD, MIR.
(1-CARBOXYHEPTADECYL)TRIMETHYLAMMONIUM HYDROXIDE, INNER SALT	DUP.
N-*2-(CARBOXYMETHYLAMINO)ETHYL*-N-(2-HYDROXYETHYL)-COCONUT OIL AMIDE, SODIUM SALT	WM.
(CARBOXYMETHYL)*3-(COCONUT OIL AMIDO)PROPYL*DIMETHYLAMMONIUM CHLORIDE, SODIUM SALT	X.
1-CARBOXYMETHYL-2-HEPTADECYL-1-(2-HYDROXYETHYL)-2-IMIDAZOLINIUM HYDROXIDE, SODIUM DERIVATIVE, SODIUM SALT	MIR.
1-CARBOXYMETHYL-1-(2-HYDROXYETHYL)-2-NONYL-2-IMIDAZOLINIUM HYDROXIDE, SODIUM DERIVATIVE, SODIUM SALT	MIR.
1-CARBOXYMETHYL-1-(2-HYDROXYETHYL)-2-UNDECYL-2-IMIDAZOLINIUM HYDROXIDE, SODIUM DERIVATIVE, SODIUM SALT	GAF, MIR.
(1-CARBOXYUNDECYL)TRIMETHYLAMMONIUM HYDROXIDE, INNER SALT	PFZ.
N-(COCONUT OIL ALKYL)-BETA-ALANINE, PARTIAL SODIUM SALT	GNM.
N-(COCONUT OIL ALKYL)-BETA-ALANINE, SODIUM SALT	GNM.
N-DODECYL-3-IMINODIPROPIONIC ACID, DISODIUM SALT	GNM.
N-(DODECYL AND TETRADECYL)-BETA-ALANINE	GNM.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
AMPHOTERIC-CONTINUED	
HEPTADECYLMETHYLBENZIMIDAZOLINESULFONIC ACID, SODIUM SALT	CGY(E).
1-(2-HYDROXYETHYL)-2-HEPTYL-3-CARBOXYETHYL-IMIDAZOLINE,SODIUM SALT	MOA.
1-(2-HYDROXYETHYL)-2-UNDECYL-3-CARBOXYETHYLIMIDAZOLINE,SODIUM SALT	MOA.
MIXED ACYCLIC PRIMARY AMINES, ETHOXYLATED AND SULFATED, SODIUM SALT	DUP, RH.
OLEIC ACID-ETHYLENEDIAMINE CONDENSATE, PROPOXYLATED AND SULFATED, SODIUM SALT	S.
POLYPEPTIDE AMMONIUM SALT	X.
POLYPEPTIDE ETHYL ESTER	X.
POLYPEPTIDE, SODIUM SALT	X.
N-(TALLOW ALKYL)-3-IMINODIPROPIONIC ACID, DISODIUM SALT	GNM.
AMPHOTERIC SURFACE-ACTIVE AGENTS, ALL OTHER	ARC, DUP, SBC, SCP, TCH.
ANIONIC	
@CARBOXYLIC ACIDS (AND SALTS THEREOF):	
@AMINE SALTS OF FATTY, ROSIN, AND TALL OIL ACIDS:	
COCONUT OIL ACIDS, DIETHANCLAMIME SALT	SOP.
COCONUT OIL ACIDS, ETHANOLAMINE SALT	SBP.
MIXED FATTY ACIDS, ETHANOLAMINE SALT	SBP.
OLEIC ACID, BUTYLAMINE SALT	DYS.
OLEIC ACID, DIETHYLAMINE SALT	WTC.
OLEIC ACID, TRIETHANOLAMINE SALT	PEK.
STEARIC ACID,N,N,N',N'-TETRAKIS(2-HYDROXYETHYL)-ETHYLENEDIAMINE SALT	ICI.
STEARIC ACID, TRIETHANOLAMINE SALT	GLY.
TALLOW ACIDS, ETHANOLAMINE SALT	SBP.
TALLOW ACIDS, TRIETHANOLAMINE SALT	SBP.
AMINE SALTS OF FATTY, ROSIN,AND TALL OIL ACIDS, ALL OTHER	GLY, PEK, WM.
@CARBOXYLIC ACIDS HAVING AMIDE, ESTER, OR ETHER LINKAGES:	
N-(COCONUT OIL ACYL)POLYPEPTIDE, SODIUM SALT	X.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@CARBOXYLIC ACIDS HAVING AMIDE, ESTER, OR ETHER LINKAGES--CONTINUED	
N-(COCONUT OIL ACYL)POLYPEPTIDE, TRIETHANOLAMINE SALT	X.
N-(COCONUT OIL ACYL)SARCOSINE	HMP.
N-(COCONUT OIL ACYL)SARCOSINE, SODIUM SALT	HMP.
N-LAUROYLSARCOSINE	HMP.
N-LAUROYLSARCOSINE, SODIUM SALT	CP, HMP, ONX.
N-(MIXED ALKYLSULFONYL)GLYCINE, SODIUM SALT	GAF.
N-OLEOYLPOLYPEPTIDE, SODIUM SALT	LMI, X.
N-OLEOYLSARCOSINE	HMP.
CARBOXYLIC ACIDS WITH AMIDE, ESTER OR ETHER LINKAGE, ALL OTHER	BRD, CHP, HMP, X.
@POTASSIUM AND SODIUM SALTS OF FATTY, ROSIN, AND TALL OIL ACIDS:	
ANIMAL GREASE, SODIUM SALT	NMC.
CASTOR OIL ACIDS, POTASSIUM SALT	NTL, SEA.
CASTOR OIL ACIDS, SODIUM SALT	HEW.
COCONUT OIL ACIDS AND OLEIC ACID, POTASSIUM SALT	DYS.
@COCONUT OIL ACIDS, POTASSIUM SALT	AES, CON, DA, DYS, ESS, GRC, GRL, HEW, HNT, NMC, PCH, PEK, PG, PNX, SOP.
@COCONUT OIL ACIDS, SODIUM SALT	AGP, BSW, CON, CP, GRC, HEW, JRG, LEV, NMC, NPB, PG.
COCONUT AND TALL OIL ACIDS, POTASSIUM SALT	DYS.
@CORN OIL ACIDS, POTASSIUM SALT	GRC, HNT, NMC.
CORN OIL ACIDS, SODIUM SALT	GRC, NMC.
FISH OIL ACIDS, SODIUM SALT	DA.
LAURIC ACID, POTASSIUM SALT	GAF.
@MIXED VEGETABLE FATTY ACIDS, POTASSIUM SALT	AES, GRC, GRL, LUR(E), PCH, QCP, SLC.
@OLEIC ACID, POTASSIUM SALT	AES, DA, HNT, PG, USB, WBG.
@OLEIC ACID, SODIUM SALT	BSW, DA, LUB(E), NMC, USR, WBG, WTC.
OLIVE OIL ACIDS, SODIUM SALT	HNT.
PALM OIL ACIDS, SODIUM SALT	HEW, LUR(E), NMC.
PALMITIC AND STEARIC ACIDS, POTASSIUM SALT	HEW.
PALMITIC AND STEARIC ACIDS, SODIUM SALT	HEW.
ROSIN ACIDS, POTASSIUM SALT	X.
ROSIN ACIDS, SODIUM SALT	FER, SLM, X.
SOYBEAN OIL ACIDS, POTASSIUM SALT	PEK, PNX.
SOYBEAN OIL ACIDS, SODIUM SALT	NMC.
STEARIC ACID, POTASSIUM SALT	CON, DA, USR, WTC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANIONIC-CONTINUED	
POTASSIUM AND SODIUM SALTS OF FATTY, ROSIN, AND TALL OIL ACIDS--CONTINUED	
STEARIC ACID, SODIUM SALT	JRG, WTC.
@TALL OIL ACIDS, POTASSIUM AND SODIUM SALTS:	
TALL OIL ACIDS, POTASSIUM SALT	AES, ASY, CON, DAN, DYS, ESS, GRC, HNT, PEK, PNX, SOP, X.
TALL OIL ACIDS, SODIUM SALT	ASY, CON, GRC, NMC, SOP, UNP, X.
TALLOW ACIDS, POTASSIUM SALT	AES, AGP, ASY, DYS, PG, USR.
@TALLOW ACIDS, SODIUM SALT	ASY, BSW, CON, CP, GRC, HEW, JRG, LEV, LUR(E), NMC, NPR, PG, PRX.
POTASSIUM AND SODIUM SALTS OF FATTY, ROSIN, AND TALL OIL ACIDS, ALL OTHER	NMC, PEK.
OTHER CARBOXYLIC ACIDS:	
CARBOXYLIC ACIDS, ALL OTHER	PG, SCP, USR.
@PHOSPHORIC AND POLYPHOSPHORIC ACID ESTERS (AND SALTS THEREOF):	
@ALCOHOLS AND PHENOLS, ETHOXYLATED AND PHOSPHATED:	
DINONYLPHENOL, ETHOXYLATED AND PHOSPHATED	GAF, MOA, TCH, WAY.
DODECYL ALCOHOL, ETHOXYLATED AND PHOSPHATED	GAF.
DODECYLPHENOL, ETHOXYLATED AND PHOSPHATED	ARL, GAF.
2-ETHYLHEXANOL, ETHOXYLATED AND PHOSPHATED	WAY.
HEXYLPHENOL, ETHOXYLATED AND PHOSPHATED	CRT.
@MIXED LINEAR ALCOHOLS, ETHOXYLATED AND PHOSPHATED	BAS, CEL, CHP, CRT, CST, CTL, GAF, MOA, MRA, SCP, TCC, TCH, WTC.
@NONYLPHENOL, ETHOXYLATED AND PHOSPHATED	ARL, AZS, CTL, DEX, GAF, MOA, NLC, SCP, SOP, TCC, WAY, WTC.
9-OCTADECENYL ALCOHOL, ETHOXYLATED AND PHOSPHATED	GAF.
OCTYLPHENOL, ETHOXYLATED AND PHOSPHATED	RH.
PHENOL, ETHOXYLATED AND PHOSPHATED	GAF, MOA, TCH, WTC, X.
POLYHYDRIC ALCOHOL, ETHOXYLATED AND PHOSPHATED	NLC, SCP.
POLYPROPYLENE GLYCOL, PHOSPHATED	LUR(E).
@TRIDECYL ALCOHOL, ETHOXYLATED AND PHOSPHATED	DAN, GAF, MIL, SNW, WTC.
ALCOHOLS AND PHENOLS, ALKOXYLATED AND PHOSPHATED OR POLYPHOSPHATED, ALL OTHER	BAS, CHP, GAF, TCH, WTC.
@ALCOHOLS, PHOSPHATED OR POLYPHOSPHATED:	
BUTYL PHOSPHATE, POTASSIUM SALT	DUP.
DECYL, DODECYL AND OCTYL PHOSPHATE, MORPHOLINE SALT	DUP.
2-ETHYLHEXYL PHOSPHATE, SODIUM SALT	CHP.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@PHOSPHORIC AND POLYPHOSPHORIC ACID ESTERS (AND SALTS THEREOF)--CONTINUED	
@ALCOHOLS, PHOSPHATED OR POLYPHOSPHATED--CONTINUED	
2-ETHYLHEXYL POLYPHOSPHATE	X.
2-ETHYLHEXYL POLYPHOSPHATE, SODIUM SALT	X.
HEXYL PHOSPHATE	ICI, SFS.
HEXYL PHOSPHATE, POTASSIUM SALT	ICI.
HEXYL POLYPHOSPHATE, POTASSIUM SALT	DEX.
MIXED ALKYL PHOSPHATE	DUP, SFS.
MIXED ALKYL PHOSPHATE, DIETHANOLAMINE SALT	DUP.
OCTYL PHOSPHATE, ALKYLAMINE SALT	DUP, NLC, SCP.
9-OCTADECENYL PHOSPHATE	DUP(E).
OCTYL DECYL PHOSPHATE	X.
OCTYL PHOSPHATE	SCP.
OCTYL POLYPHOSPHATE	DEX.
OCTYL POLYPHOSPHATE, POTASSIUM SALT,	DEX, SNW.
PHOSPHATED AND POLYPHOSPHATED ALCOHOLS, ALL OTHER	BRD, MIL.
OTHER PHOSPHORIC AND POLYPHOSPHORIC ACID ESTERS:	
GLYCEROL MONOESTER OF MIXED FATTY ACIDS, PHOSPHATED	QCP, WTC.
@SULFONIC ACIDS (AND SALTS THEREOF):	
@ALKYLBENZENESULFONATES:	
DODECYLBENZENESULFONATES:	
@DODECYLBENZENESULFONIC ACID	CO, CRT, CTL, EMK(E), HLI, LAK, LEV, MON, PIL, PLX, PRX, RCD, TCI, TEN, WTC.
DODECYLBENZENESULFONIC ACID, AMMONIUM SALT	HLI, STP.
DODECYLBENZENESULFONIC ACID, BUTYLAMINE SALT	WTC.
@DODECYLBENZENESULFONIC ACID, CALCIUM SALT	ICI, NLC, RCD, RH, STP, TMH, WTC.
DODECYLBENZENESULFONIC ACID, DIMETHYLAMINE SALT	PIL.
DODECYLBENZENESULFONIC ACID, ETHYLENEDIAMINE SALT	ICI.
@DODECYLBENZENESULFONIC ACID, ISOPROPYLAMINE SALT	CIN, CTL, ICI, MRV, RCD, STP, TCH, WTC.
DODECYLBENZENESULFONIC ACID, (MIXED ALKYL)AMINE SALT	ECC.
DODECYLBENZENESULFONIC ACID, POTASSIUM SALT	STP.
@DODECYLBENZENESULFONIC ACID, SODIUM SALT	AAC, ATR, AZS, BLA, CEL, CO, CP, CRT, CTL, DEP, DUP, ECC, HLI, LEV, NMC, PEK, PG, PIL, PLX, PRX, RCD, SOP, STP, TEN.
DODECYLBENZENESULFONIC ACID, STRONTIUM SALT	HLI.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@SULFONIC ACIDS (AND SALTS THEREOF)--CONTINUED	
@ALKYLBENZENESULFONATES--CONTINUED	
DODECYLBENZENESULFONATES--CONTINUED	
@DODECYLBENZENESULFONIC ACID, TRIETHANOLAMINE SALT	AAC, ARL, ATR, CIN, CTL, ESS, PIL, RCD, SOP, WTC.
DODECYLBENZENE SULFONATES, ALL OTHER	WTC.
OTHER ALKYLBENZENESULFONATES:	
PENTADECYLBENZENESULFONIC ACID, POTASSIUM SALT	STP.
TRIDECYLBENZENESULFONIC ACID	RCD.
TRIDECYLBENZENESULFONIC ACID, SODIUM SALT	BLA, CP, NPR, PG, RCD, WTC.
UNDECYLBENZENE SULFONIC ACID	SCP.
UNDECYLBENZENE SULFONIC ACID, SODIUM SALT	WTC.
UNDECYLBENZENE SULFONIC ACID, TRIETHANOLAMINE SALT	SCP, WTC.
ALKYLBENZENE SULFONATES, ALL OTHER	SCP, USR, WTC.
@BENZENE-, CUMENE-, TOLUENE-, AND XYLENESULFONATES:	
CUMENESULFONIC ACID, AMMONIUM SALT	NES, WTC.
CUMENESULFONIC ACID, SODIUM SALT	NES, WTC.
@TOLUENESULFONIC ACID, POTASSIUM AND SODIUM SALTS:	
TOLUENESULFONIC ACID	NES, SCP, STP.
TOLUENESULFONIC ACID, SODIUM SALT	CO, NES, PG, STP, WTC.
@XYLENESULFONIC ACID, AMMONIUM SALT	CO, NES, SCP, STP, WTC.
@XYLENESULFONIC ACID, SODIUM SALT	CO, NES, PIL, SCP, SDC, STP, WTC.
BENZENE-, CUMENE-, TOLUENE-, AND XYLENESULFONATES, ALL OTHER	WTC.
@LIGNINSULFONATES:	
LIGNINSULFONIC ACID, AMMONIUM SALT	CRZ, PG, SPA.
@LIGNINSULFONIC ACID, CALCIUM SALT	CRZ, CWP, LKY(E), MAR, PSP.
LIGNINSULFONIC ACID, CHROMIUM SALT	MAR, PSP, RAY.
LIGNINSULFONIC ACID, IRON SALT	CRZ, PSP.
LIGNINSULFONIC ACID, MAGNESIUM SALT	CWP.
LIGNINSULFONIC ACID, MIXED SALT	SPA.
LIGNINSULFONIC ACID, POTASSIUM SALT	SPA.
@LIGNINSULFONIC ACID, SODIUM SALT	CRZ, MAR, PSP, RAY, SPA, WVA.
LIGNINSULFONIC ACID, ZINC SALT	PSP.
@NAPHTHALENESULFONATES:	
BUTYLNAPHTHALENESULFONIC ACID	DA.
BUTYLNAPHTHALENESULFONIC ACID, SODIUM SALT	DA, ECC.
DIBUTYLNAPHTHALENESULFONIC ACID	GAF.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURRR, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@NAPHTHALENESULFONATES--CONTINUED	
DIISOPROPYLNAPHTHALENESULFONIC ACID, SODIUM SALT	DA, DUP.
DIPENTYLNAPHTHALENESULFONIC ACID, (MIXED ALKYL) AMINE SALT	NLC.
ISOPROPYLNAPHTHALENESULFONIC ACID	DUP(E).
METHYLENEBIS(2-NAPHTHALENESULFONIC ACID), SODIUM SALT	DUP.
METHYLNAPHTHALENESULFONIC ACID, SODIUM SALT	DA.
METHYLNONYLNAPHTHALENESULFONIC ACID, SODIUM SALT	UDI.
TETRAHYDRONAPHTHALENESULFONIC ACID, SODIUM SALT	DUP.
NAPHTHALENESULFONATES, ALL OTHER	CGY(E), DUP.
@SULFONIC ACIDS HAVING AMIDE LINKAGES:	
@SULFOSUCCINAMIC ACID DERIVATIVES:	
N-(1,2-DICARBOXYETHYL)-N-OCTADECYLSULFOSUCCINAMIC ACID, TETRASODIUM SALT	ACY, MOA.
N-OCTADECYLSULFOSUCCINAMIC ACID, DISODIUM SALT	ACY.
N-(OLEOYLOXYISOPROPYL)SULFOSUCCINAMIC ACID	WTC.
SULFOSUCCINAMIC ACID DERIVATIVES, ALL OTHER	ARD, SBC.
@TAURINE DERIVATIVES:	
N-(COCONUT OIL ACYL)-N-METHYLTAURINE, SODIUM SALT	GAF, TNI.
N-CYCLOHEXYL-N-PALMITOYLTAURINE, SODIUM SALT	GAF.
N-METHYL-N-OLEOYLTAURINE, SODIUM SALT	GAF, HRT, MRA.
N-METHYL-N-PALMITOYLTAURINE, SODIUM SALT	GAF.
N-METHYL-N-(TALL OIL ACYL)TAURINE, SODIUM SALT	CRT, GAF, X.
@SULFONIC ACIDS HAVING ESTER OR ETHER LINKAGES:	
@SULFOSUCCINIC ACID ESTERS:	
SULFOSUCCINIC ACID-BIS(DIISOBUTYL)ESTER, SODIUM SALT	MOA.
SULFOSUCCINIC ACID, BIS(2,6-DIMETHYL-4-HEPTYL)ESTER, SODIUM SALT	DAN, GAF, MOA.
@SULFOSUCCINIC ACID, BIS(2-ETHYLHEXYL) ESTER, SODIUM SALT	ACY, CGY(E), CHP, CRT, DA, DAN, ECC, EMK(E), HRT, MCP, MOA, PC(E), RH, SCO, WTC.
SULFOSUCCINIC ACID, DIHEXYL ESTER, SODIUM SALT	ACY, MOA.
SULFOSUCCINIC ACID, DIPENTYL ESTER, SODIUM SALT	ACY.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@SULFONIC ACIDS HAVING ESTER OR ETHER LINKAGES--CON.	
@SULFOSUCCINIC ACID ESTERS--CONTINUED	
SULFOSUCCINIC ACID, DITRIDECYL ESTER, SODIUM SALT	ACY, MOA.
SULFOSUCCINIC ACID ESTERS, ALL OTHER	ARD, HDG, LAK, SCP.
ALL OTHER SULFONIC ACIDS HAVING ESTER OR ETHER LINKAGES:	
COCONUT OIL ACIDS, 2-SULFOETHYL ESTER, SODIUM SALT	GAF, LEV, X.
DODECYLDIPHENYLOXIDEDISULFONIC ACID, DISODIUM SALT	DOW.
GLYCEROL MONOSTEARATE SULFOACETATE, SODIUM SALT	WTC.
ISO-OCTYPHENOL, ETHOXYLATED AND SULFONATED, SODIUM SALT	RH.
NORMAL-OCTYLPHENOL, ETHOXYLATED AND SULFONATED, SODIUM SALT	CRT.
SULFONIC ACID WITH ESTER LINKAGES, ALL OTHER	STP.
SULFONIC ACIDS WITH ETHER LINKAGES, ALL OTHER	PG, WTC.
OTHER SULFONIC ACIDS:	
BUTYLHYDROXYBIPHENYLSULFONIC ACID	RBC.
MIXED ALKANE SULFONIC ACID, SODIUM SALT	CCL, DUP, QCP.
PETROLEUMSULFONIC ACID, WATER SOLUBLE (ACID LAYER), SODIUM SALT	WTC.
SULFOSUCCINIC ACID-HALF ESTER (COCONUT MONOISOPROPANOL)AMIDE, DISODIUM SALT	MOA.
SULFONIC ACIDS, ALL OTHER	ARD, LAK, SCP, SLM, STP, USR, WTC.
@SULFURIC ACID ESTERS (AND SALTS THEREOF):	
@ACIDS, AMIDES, AND ESTERS, SULFATED:	
COCONUT OIL ACIDS-ETHANOLAMINE SALT, SULFATED, POTASSIUM SALT	DEX, EMK(E).
CARBOXYLIC ACID ESTERS (EXCEPT NATURAL FATS AND OILS), SULFATED:	
@ESTERS OF SULFATED OLEIC ACID:	
2-BUTOXYETHYL OLEATE, SULFATED, SODIUM SALT	S.
@BUTYL OLEATE, SULFATED, SODIUM SALT	AKS, CIN, CRT, ICI, MCP, MRV, PC(E).
BUTYL AND PROPYL OLEATE, SULFATED, SODIUM SALT	MCP.
GLYCEROL TRIOLEATE, SULFATED, SODIUM SALT	MRV.
ISOBUTYL OLEATE, SULFATED, SODIUM SALT	CHP, DA.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@ESTERS OF SULFATED OLEIC ACID--CONTINUED	
ISOPROPYL OLEATE, SULFATED, SODIUM	CRT, DEX, HRT.
METHYL OLEATE, SULFATED, SODIUM SALT	AZS, DUP, ICI.
@PROPYL OLEATE, SULFATED, SODIUM SALT	ACY, AKS, CHP, MRV.
ESTERS OF SULFATED OLEIC ACID, ALL OTHER	CHP.
OTHER SULFATED ESTERS:	
GLYCEROL MONOESTER OF COCONUT OIL ACIDS, SULFATED, SODIUM SALT	CP.
SULFATED ESTERS, ALL OTHER	DA, DUP.
OTHER SULFURIC ACID ESTERS:	
MIXED FATTY ACIDS, SULFATED, POTASSIUM SALT	SCO.
OLEIC ACID, SULFATED, DISODIUM SALT	ACT, DA, GAF, TEN.
SULFURIC ACID ESTERS, ALL OTHER	SLM.
TALL OIL, SULFATED, SODIUM SALT	ACT, APX, BAO, CHP, CRT, DA, ICI, KAL, SEA, WHI, WHW.
@ALCOHOLS, SULFATED:	
COCONUT AND SPERM OIL ALKYL SULFATE, SODIUM SALT	DA.
DECYL AND OCTYL SULFATE, SODIUM SALT	TCH.
DECYL SULFATE, SODIUM SALT	CTL, HLI, SCP.
@DODECYLSULFATE SALTS:	
DODECYL SULFATE, 2-AMINO-2-METHYLPROPANOL SALT	DUP(E).
@DODECYL SULFATE, AMMONIUM SALT	AAC, CTL, EMK(E), HLI, JRG, ONX, SCP, STP, TCH, TNI.
DODECYL SULFATE, DIETHANOLAMINE SALT	DUP, JRG, SCP, STP, TCH.
DODECYL SULFATE, N,N-DIETHYLCYCLOHEXYLAMINE SALT	DUP.
DODECYL SULFATE, ISOPROPANOLAMINE SALT	JRG, TCH.
@DODECYL SULFATE, MAGNESIUM SALT	AAC, HLI, ONX, STP.
DODECYL SULFATE, POTASSIUM SALT	PG.
@DODECYL SULFATE, SODIUM SALT	AAC, CTL, DUP, HLI, JRG, ONX, SCP, STP, TCH.
@DODECYL SULFATE, TRIETHANOLAMINE SALT	AAC, CTL, ONX, SCP, STP, TCH.
2-ETHYLHEXYL SULFATE, SODIUM SALT	AAC, SCP, TCH, UCC(E).
7-ETHYL-2-METHYL-4-UNDECYL SULFATE, SODIUM SALT	UCC(E).
HEXADECYL SULFATE, SODIUM SALT	AAC.
HEXYL SULFATE, POTASSIUM SALT	DEX.
MIXED LINEAR ALCOHOLS, SULFATED, TRIETHANOLAMINE SALT	LAK, PG, RCD, SCP.
MIXED LINEAR ALCOHOLS, SULFATED, ALKYLAMINE SALT	DUP.
@MIXED LINEAR ALCOHOLS, SULFATED, AMMONIUM SALT	LAK, NTL, PG, RCD, S, SCP, UCC(E).

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@ALCOHOLS, SULFATED--CONTINUED	
MIXED LINEAR ALCOHOLS, SULFATED, SODIUM SALT	DUP, LAK, PG, RCD, SCP, WTC.
NON.L SULFATE, SODIUM SALT	TEN.
OCTYL SULFATE, SODIUM SALT	AAC, APX, DUP.
TRIDECYL SULFATE, SODIUM SALT	AAC, SCP.
LINEAR ALCOHOLS, SULFATED, ALL OTHER	
@ETHERS, SULFATED:	
ALKYLPHENOLS, ETHOXYLATED AND SULFATED:	
1-NAPHTHOL, ETHOXYLATED AND SULFATED, SODIUM SALT	TCH.
NONYLPHENOL, ETHOXYLATED AND SULFATED, AMMONIUM SALT	GAF, HLI, MOA, STP, WTC.
NONYLPHENOL, ETHOXYLATED AND SULFATED, SODIUM SALT	CRT, GAF.
OCTYLPHENOL, ETHOXYLATED AND SULFATED, SODIUM SALT	RH.
DECYL ALCOHOL, PROPOXYLATED AND SULFATED, SODIUM SALT	APX.
DODECYL ALCOHOL, ETHOXYLATED AND SULFATED, AMMONIUM SALT	AAC, AKS, CTL, HLI, STP.
@DODECYL ALCOHOL, ETHOXYLATED AND SULFATED, SODIUM SALT	AAC, CTL, HLI, ONX, SCP, STP, TCH.
DODECYL AND TETRADECYL ALCOHOLS, ETHOXYLATED AND SULFATED, AMMONIUM SALT	LEV.
HEXYL ALCOHOL, PROPOXYLATED AND SULFATED, SODIUM SALT	APX.
@MIXED LINEAR ALCOHOLS, ETHOXYLATED AND SULFATED, AMMONIUM SALT	CO, LAK, MOA, PG, PIL, RCD, SCP, SHC, STP, WTC.
@MIXED LINEAR ALCOHOLS, ETHOXYLATED AND SULFATED, SODIUM SALT	CO, DA, DUP, GAF, HLI, LAK, LEV, PG, PIL, RCD, SCP, SHC, STP, TCI, WTC.
TRIDECYL ALCOHOL, ETHOXYLATED AND SULFATED, SODIUM SALT	AAC.
SULFATED ETHERS, ALL OTHER	ARC, PG, WTC.
@NATURAL FATS AND OILS, SULFATED:	
@CASTOR OIL, SULFATED, SODIUM SALT	ACT, ACY, AKS, APX, ARL, BAO, CRT, DA, DEX, GAF, HRT, ICI, KAL, LEA, LUR(E), MRV, S, SCO, SCP, SLM, WHW.
COCONUT OIL, SULFATED, SODIUM SALT	BAO, DA, LUR(E).

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A N I O N I C - C O N T I N U E D	
@NATURAL FATS AND OILS, SULFATED--CONTINUED	
@COD OIL, SULFATED, SODIUM SALT	ACT, BAO, SEA, WHI, WHW.
GREASE, OTHER THAN WOOL, SULFATED, SODIUM SALT	SEA, WHI.
HERRING OIL, SULFATED, SODIUM SALT	ACT, SEA, SLM, WHW.
LARD, SULFATED, SODIUM SALT	CRT, WAW, WHW.
MIXED FISH OILS, SULFATED, SODIUM SALT	ACT, MRD, SLM.
MIXED VEGETABLE OILS, SULFATED, SODIUM SALT	LUR(E).
MUSTARD SEED OIL, SULFATED, SODIUM SALT	DA.
@NEAT'S FOOT OIL, SULFATED, SODIUM SALT	ACT, ARC, BAO, DA, MRD, PC(E), SEA, SLM.
PEANUT OIL, SULFATED, SODIUM SALT	LUR(E), SEA.
PECAN OIL, SULFATED, SODIUM SALT	CRT.
@SOYBEAN OIL, SULFATED, SODIUM SALT	ACT, HRT, ONX, SEA, WHW.
@SPERM OIL, SULFATED, SODIUM SALT	DA, ONX, WHI, WHW.
@TALLOW, SULFATED, SODIUM SALT	ACT, ACY, AZS, DA, ECC, LUR(E), PC(E), SID, SLM, SOS, WHI.
OTHER ANIONIC SURFACE-ACTIVE AGENTS:	
FATTY ACID LACTOLATES, MIXED SALTS	BFP.
LIGNIN, SODIUM SALT	WVA.
MIXED LINEAR OLEFIN SULFONATE	CP, NLC.
POLYETHYLENE-VINYL ALCOHOL COPOLYMER, POTASSIUM SALT	NLC.
TRIDECYL ALCOHOL, ETHOXYLATED AND CARBONATED, SODIUM SALT	S.
ANIONIC SURFACE-ACTIVE AGENTS, ALL OTHER	S, SLM.
C A T I O N I C	
@AMINE OXIDES AND OXYGEN-CONTAINING AMINES (EXCEPT THOSE HAVING AMIDE LINKAGES):	
@ACYCLIC:	
N,N-BIS(2-HYDROXYETHYL)(COCONUT OIL ALKYL)AMINE	ARC.
N,N-BIS(2-HYDROXYETHYL)OCTADECYLAMINE	ARC.
N,N-BIS(2-HYDROXYETHYL)(TALLOW ALKYL)AMINE	ARC.
(COCONUT OIL ALKYL)AMINE, ETHOXYLATED	ARC, BRD, GAF, ICI, NLC.
(COCONUT OIL ALKYL)AMINE, ETHOXYLATED, MALEATE	SDH.
(COCONUT OIL ALKYL)AMINE, ETHOXYLATED, OLEATE	DUP.
N,N-DIMETHYL DODECYLAMINE OXIDE	PG.
N,N-DIMETHYLHEXADECYLAMINE OXIDE	ONX.
(HYDROGENATED TALLOW ALKYL)AMINE, ETHOXYLATED	TCH.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C A T I O N I C - C O N T I N U E D	
@AMINE OXIDES AND OXYGEN-CONTAINING AMINES (EXCEPT THOSE HAVING AMIDE LINKAGES)--CONTINUED	
@ACYCLIC--CONTINUED	
N-(2-HYDROXYETHYL)-N,N',N'-TRIS(2-HYDROXYPROPYL)-ETHYLENEDIAMINE	NLC.
(MIXED ALKYL)AMINE, ETHOXYLATED	GAF, ICI, RH.
(9-OCTADECENYL)AMINE, ETHOXYLATED	ARC, TCH.
OCTADECYLAMINE, ETHOXYLATED	ARC, TCH.
POLYETHYLENEPOLYAMINE, ALKCXYLATED	NLC.
(SOYBEAN OIL ALKYL)AMINE, ETHOXYLATED	ARC.
@(TALLOW ALKYL)AMINE, ETHOXYLATED	ARC, DUP, GAF, TCH.
TALLOW ALKYL AMINE, SULFATED, ETHOXYLATED	DUP.
N-(TALLOW ALKYL)TRIMETHYLENEDIAMINE, ETHOXYLATED	ARC, TCH.
N,N,N',N'-TETRAKIS(2-HYDROXYETHYL)ETHYLENEDIAMINE	NLC.
N,N,N-TETRAKIS(2-HYDROXYPROPYL)ETHYLENEDIAMINE DIOLEATE, METHYL SULFATE	DUP.
N,N,N',N'-TETRAKIS(2-HYDROXYPROPYL)ETHYLENEDIAMINE, PROPOXYLATED AND ETHOXYLATED	ARC.
AMINE OXIDES AND OXYGEN-CONTAINING AMINES (EXCEPT THOSE WITH AMIDE LINKAGES), ACYCLIC, ALL OTHER	ARC, BRD, DUP, FIN, GAF, MIL, PG, TCH.
@CYCLIC:	
HEPTADECENYLAMINE, ETHOXYLATED	DA.
2-(8-HEPTADECENYL)-4,4-BIS(HYDROXYMETHYL)-2-OXAZOLINE	IMC(E).
2-(8-HEPTADECENYL)-4-HYDROXYMETHYL-4-METHYL-2-OXAZOLINE	BRD, IMC(E).
2-HEPTADECYL-1-(2-HYDROXYETHYL)-2-IMIDAZOLINE	CHP.
1-(2-HYDROXYETHYL)-2-HEPTADECYL-3-CARBOXYETHYLIMIDAZOLINE	MOA.
1-(2-HYDROXYETHYL)-2-UNDECYL-3-CARBOXYETHYLIMIDAZOLINE	MOA.
1-(2-HYDROXYETHYL)-2-HEPTADECYL-2-IMIDAZOLINE	SNW.
1-(2-HYDROXYETHYL)-2-NONYL-2-IMIDAZOLINE	BRD, MOA, SCP.
1-(2-HYDROXYETHYL)-2-NOR(COCONUT OIL ALKYL)-2-IMIDAZOLINE	GAF, MOA, SCP.
@1-(2-HYDROXYETHYL)-2-NOR(TALL OIL ALKYL)-2-IMIDAZOLINE	BRD, HDG, MOA, NLC, TCH.
LIGNIN AMINES	WVA.
ROSIN AMINE, ETHOXYLATED	HPC.
META-TOLUIDINE, ETHOXYLATED	MIL.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC-CONTINUED	
@CYCLIC--CONTINUED	
@AMINE OXIDES AND OXYGEN-CONTAINING AMINES (EXCEPT THOSE HAVING AMINE LINKAGES), CYCLIC, ALL OTHER	CGY(E), TCH.
@AMINES AND AMINE OXIDES HAVING AMIDE LINKAGES:	
@CARBOXYLIC ACID - DIAMINE AND POLYAMINE CONDENSATES:	
COCONUT OIL ACIDS-N,N-DIMETHYLTRIMETHYLENEDIAMINE CONDENSATE	JRG, SCP.
MIXED FATTY ACIDS-POLYALKYLENEPOLYAMINE CONDENSATE	GRD, NLC, QCP, TCH.
OLEIC ACID-DIETHYLENETRIAMINE CONDENSATE	AKS, ICI.
OLEIC ACID-N,N-DIMETHYLTRIMETHYLENEDIAMINE CONDENSATE	CCW.
OLEIC ACID-ETHYLENEDIAMINE CONDENSATE, MONOETHOXYLATED	CLD, DEX, SOC, TNA(E).
PELARGONIC ACID-TETRAETHYLENEPENTAMINE CONDENSATE	ICI.
STEARIC ACID-N,N-DIETHYLETHYLENEDIAMINE CONDENSATE	S.
STEARIC ACID-DIETHYLENETRIAMINE CONDENSATE	AKS, CHP, S, STC.
STEARIC ACID-DIETHYLENETRIAMINE CONDENSATE, POLYETHOXYLATED	APX.
STEARIC ACID-ETHYLENEDIAMINE CONDENSATE, MONOETHOXYLATED	CST, DA, DEX, ICI, MRV, S, SLC.
STEARIC ACID-ETHYLENEDIAMINE CONDENSATE, POLYETHOXYLATED	ICI.
STEARIC ACID-TETRAETHYLENEPENTAMINE CONDENSATE	ONX.
@TALL OIL ACIDS-DIETHYLENETRIAMINE AND POLYALKYLE POLYAMINE CONDENSATE:	
TALL OIL ACIDS-DIETHYLENETRIAMINE CONDENSATE	AZS, NCW, NLC, SCP.
TALL OIL ACIDS-POLYALKYLENEPOLYAMINE CONDENSATE	ARC, AZS, QCP, SCP.
CARBOXYLIC ACID-DIAMINE AND POLYAMINE CONDENSATES ALL OTHER	ICI, SNW, STC.
OTHER AMINES AND AMINE OXIDES HAVING AMIDE LINKAGES:	
3-LAURAMIDO-N,N-DIMETHYLPROPYLAMINE OXIDE	SNW.
STEARIC ACID,DIETHANOLAMINE CONDENSATE, METHYL SULFATE	DUP.
AMINES AND AMINE OXIDES HAVING AMIDE LINKAGES, ALL OTHER	HLI, SCP.
@AMINES, NOT CONTAINING OXYGEN (AND SALTS THEREOF):	
AMINE SALTS:	
(COCONUT OIL ALKYL)AMINE ACETATE	ARC.
(HYDROGENATED TALLOW ALKYL)AMINE ACETATE	ARC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C A T I O N I C - C O N T I N U E D	
@AMINES, NOT CONTAINING OXYGEN (AND SALTS THEREOF)--CON.	
AMINE SALTS--CONTINUED	
(9-OCTADECENYL)AMINE ACETATE	ARC, GNM.
(TALLOW ALKYL)AMINE ACETATE	ARC.
N-(TALLOW ALKYL)TRIMETHYLENEDIAMINE ACETATE	ARC, ASH.
N-(TALLOW ALKYL)TRIMETHYLENEDIAMINE OLEATE	ARC, ASH.
AMINE SALTS (NOT CONTAINING OXYGEN), ALL OTHER	ARC, SM.
@DIAMINES AND POLYAMINES:	
@IMIDAZOLINE DERIVATIVES:	
1-(2-AMINOETHYL)-2-NOR(TALL OIL ALKYL)-2-IMIDAZOLINE	AZS, SCP.
N-(DOCOSYL AND EICOSYL)TRIMETHYLENEDIAMINE	ENO.
2-HEPTADECYL-2-IMIDAZOLINE	SCO.
1-*3-(2-AMINOETHYLNAPHTH)-1-YL*-2-(8-HEPTADECENYL)-2-IMIDAZOLINE	NLC.
N-(COCONUT OIL ALKYL)TRIMETHYLENEDIAMINE	ARC, ENO, GNM.
N-DODECYLDIETHYLENETRIAMINE	ARC.
N-(MIXED ALKYL)POLYETHYLENEPOLYAMINE	ARC, BAS, CCW, SNW.
@N-(9-OCTADECENYL)TRIMETHYLENEDIAMINE	ARC, ASH, GNM.
N-(SOYBEAN OIL ALKYL)TRIMETHYLENEDIAMINE	ENO.
N-(TALLOW - ALKYL)DIPROPYLENETRIAMINE	GNM.
N-(TALLOW ALKYL)TRIMETHYLENEDIAMINE	ARC, ASH, ENO, GNM.
DIAMINES AND POLYAMINES, ALL OTHER	STC.
@PRIMARY MONOAMINES:	
(COCONUT OIL ALKYL)AMINE	ARC, ASH, ENO, GNM.
(DOCOSYL AND EICOSYL)AMINE	ENO.
DODECYLAMINE	ARC, ASH, GNM.
HEXADECYLAMINE	ARC.
@(HYDROGENATED TALLOW ALKYL)AMINE	ARC, ASH, ENO, GNM.
(MIXED ALKYL)AMINE	ARC.
(MIXED TERT-ALKYL)AMINE	ARC.
9-OCTADECENYLAMINE	ARC, ASH, ENO, GNM.
OCTADECYLAMINE	ARC, ASH, ENO.
OCTYLAMINE	ARC.
(SOYBEAN OIL ALKYL)AMINE	ARC, ENO.
(TALL OIL ALKYL)AMINE	GNM.
@(TALLOW ALKYL)AMINE	ASH, ENO, GNM, X.
@SECONDARY AND TERTIARY MONOAMINES:	

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC-CONTINUED	
@AMINES, NOT CONTAINING OXYGEN (AND SALTS THEROF)--CON.	
@SECONDARY AND TERTIARY MONOAMINES--CONTINUED	
BIS(COCONUT OIL ALKYL)AMINE	ARC.
BIS(HYDROGENATED TALLOW ALKYL)AMINE	ARC, ASH.
N,N-DIMETHYL(COCONUT OIL ALKYL)AMINE	ARC, BRD, ENO.
N,N-DIMETHYLDECYLAMINE	BRD.
N,N-DIMETHYLDODECYLAMINE	ARC, BRD.
N,N-DIMETHYLHEXADECYLAMINE	ARC, BRD.
N,N-DIMETHYL(HYDROGENATED TALLOW ALKYL)AMINE	ARC, ASH, ENO.
@N,N-DIMETHYL(MIXED ALKYL)AMINE	ARC, BRD, ENO, ONX.
N,N-DIMETHYLOCTADECYLAMINE	ARC, BRD, ENO, ONX.
N,N-DIMETHYLOCTYLAMINE	BRD.
N,N-DIMETHYL(SOYBEAN OIL ALKYL)AMINE	ARC, ENO.
N,N-DIMETHYLTETRADECYLAMINE	ARC, BRD.
N-METHYLBIS(COCONUT OIL ALKYL)AMINE	ENO.
N-METHYLBIS(HYDROGENATED TALLOW ALKYL)AMINE	ENO, GNM.
TRIISODECYLAMINE	GNM.
TRILAURYLAMINE	GNM.
TRIOCTYLAMINE	GNM.
SECONDARY AND TERTIARY MONOAMINES, ALL OTHER	ARC.
@OXYGEN-CONTAINING QUATERNARY AMMONIUM SALTS:	
(2-AMINOETHYL)ETHYL(HYDROGENATED TALLOW ALKYL)(2-HYDROXYETHYL)AMMONIUM ETHYL SULFATE	LUR(E).
BENZYL(COCONUT OIL ALKYL)BIS(2-HYDROXYETHYL)AMMONIUM CHLORIDE	NLC, SCP.
BENZYL(COCONUT OIL ALKYL,ETHOXYLATED)DIMETHYLAMMONIUM CHLORIDE	DUP, GAF, SCP.
1-BENZYL-1-(2-HYDROXYETHYL)-2-NOR(TALL OIL ALKYL)-2-IMIDAZOLINE	MOA, NLC.
BENZYL(TALLOW ALKYL)BIS(2-HYDROXYETHYL)AMMONIUM CHLORIDE	DUP.
BIS(2-HYDROXYETHYL, ETHOXYLATED)METHYL(9-OCTADECENYL)-AMMONIUM CHLORIDE	ARC.
BIS(2-HYDROXYETHYL, ETHOXYLATED)METHYLOCTADECYLAMMONIUM CHLORIDE	ARC.
(COCONUT OIL ALKYL)BIS(2-HYDROXYETHYL, ETHOXYLATED)-METHYLAMMONIUM CHLORIDE	ARC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC-CONTINUED	
@OXYGEN-CONTAINING QUATERNARY AMMONIUM SALTS--CON.	
(ETHOXYBENZYL)DIMETHYL(OCTYLPHENOXY)AMMONIUM CHLORIDE	RH.
(ETHOXYBENZYL)DIMETHYL(OCTYLTOLYLOXY)AMMONIUM CHLORIDE	RH.
1-ETHYL-2-(8-HEPTADECENYL)-1-(2-HYDROXYETHYL)-2-IMIDAZOLINIUM ETHYL SULFATE	ICI.
N-ETHYL-N-HEXADECYLMORPHOLINIUM ETHYL SULFATE	BRD, ICI.
N-ETHYL-N-(SOYBEAN OIL ALKYL)MORPHOLINIUM ETHYL SULFATE	ICI.
(2-HYDROXYETHYL)DIMETHYL(3-STEARAMIDOPROPYL)AMMONIUM DIHYDROGEN PHOSPHATE	ACY.
(2-HYDROXYETHYL)DIMETHYL(3-STEARAMIDOPROPYL)AMMONIUM NITRATE	ACY.
(3-LAURAMIDOPROPYL)TRIMETHYLAMMONIUM METHYL SULFATE	ACY.
2-(2-LAUROYLOXYETHYL)CARBAMOYL-1-METHYLPYRIDINIUM CHLORIDE	WTC.
1-METHYL-2-(2-STEAROYLOXYETHYL)CARBAMOYLPYRIDINIUM CHLORIDE	WTC.
OXYGEN-CONTAINING QUATERNARY AMMONIUM SALTS (EXCEPT THOSE HAVING AMIDE LINKAGES), ALL OTHER	AAC, ARC, CGY, HLI, ICI.
QUATERNARY AMMONIUM SALTS HAVING AMIDE LINKAGES, ALL OTHER	MRV, TCH, X.
@QUATERNARY AMMONIUM SALTS, NOT CONTAINING OXYGEN:	
@ACYCLIC:	
BIS(COCONUT OIL ALKYL)DIMETHYLAMMONIUM CHLORIDE	ARC, ASH, ENO, GNM.
BIS(COCONUT OIL ALKYL)DIMETHYL-AMMONIUM NITRATE	ARC.
@BIS(HYDROGENATED TALLOW ALKYL)DIMETHYLAMMONIUM CHLORIDE	ARC, ASH, ENO, GNM.
(COCONUT OIL ALKYL)TRIMETHYLAMMONIUM CHLORIDE	ARC.
DIDECYLDIMETHYLAMMONIUM CHLORIDE	BRD.
DIMETHYLBIS(SOYBEAN OIL ALKYL)AMMONIUM CHLORIDE	ARC.
DIMETHYLDIOCTADECYLAMMONIUM CHORIDE	ASH.
DODECYLTRIMETHYLAMMONIUM BROMIDE	DUP(E).
DODECYLTRIMETHYLAMMONIUM CHLORIDE	ARC, GNM.
ETHYLDIMETHYL(MIXED ALKYL)AMMONIUM ETHYL SULFATE	DEX, JOR, TCC.
ETHYLDIMETHYL(9-OCTADECENYL)AMMONIUM BROMIDE	ONX.
ETHYLHEXADECYLDIMETHYLAMMONIUM BROMIDE	FIN.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC-CONTINUED	
@QUATERNARY AMMONIUM SALTS, NOT CONTAINING OXYGEN--CON.	
@ACYCLIC--CONTINUED	
HEXADECYLTRIMETHYLAMMONIUM BROMIDE	FIN.
HEXADECYLTRIMETHYLAMMONIUM CHLORIDE	ARC, BRD.
HEXADECYLTRIMETHYLAMMONIUM PARA-TOLUENESULFONATE	FIN.
METHYLTRIOCTYLAMMONIUM CHLORIDE	GNM.
(MIXED LINEAR ALKYL) TRIMETHYL AMMONIUM BROMIDE	DUP.
N,N,N',N',N'-PENTAMETHYL-N-(TALLOW ALKYL)TRIMETHYLENE-BIS*AMMONIUM CHLORIDE*	ARC, GNM.
TRIMETHYL(MIXED ALKYL)AMMONIUM CHLORIDE	NLC.
TRIMETHYLOCTADECYLAMMONIUM CHLORIDE	ARC.
TRIMETHYL(SOYBEAN OIL ALKYL)AMMONIUM CHLORIDE	ARC.
@TRIMETHYL(TALLOW ALKYL)AMMONIUM CHLORIDE	ARC, ASH, GNM.
TRIMETHYLTETRADECYLAMMONIUM BROMIDE	FIN, ICI.
QUATERNARY AMMONIUM SALTS, NOT CONTAINING OXYGEN, ACYCLIC, ALL OTHER	BRD, X.
@BENZENOID:	
@BENZYL(COCONUT OIL ALKYL)DIMETHYLAMMONIUM CHLORIDE	ARC, CIN, CRT, DEP, ENO, LUR(E).
@BENZYLDIMETHYL(MIXED ALKYL)AMMONIUM CHLORIDE	AAC, BRD, FIN, ONX, RH, SDH.
BENZYLDIMETHYL(TALLOW ALKYL)AMMONIUM CHLORIDE	ENO.
@BENZYLDIMETHYLOCTADECYLAMMONIUM CHLORIDE	FIN, HLI, ONX, RH, SCP, SNW, TNI.
BENZYLDIMETHYLTETRADECYLAMMONIUM CHLORIDE	SDH.
BENZYLDODECYLDIMETHYLAMMONIUM CHLORIDE	ONX.
BENZYL(HYDROGENATED TALLOW ALKYL)DIMETHYLAMMONIUM CHLORIDE	ENO.
1-BENZYLPYRIDINIUM CHLORIDE	DEP.
BENZYLTRIMETHYLAMMONIUM CHLORIDE	CIN, CRT, SNW, TCC.
(3,4-DICHLOROBENZYL)DODECYLDIMETHYLAMMONIUM CHLORIDE	ONX.
(DODECYLBENZYL)TRIETHYLAMMONIUM CHLORIDE	PC(E).
2-DODECYLISOQUINOLINIUM BROMIDE	ONX.
(DODECYLMETHYLBENZYL)TRIMETHYLAMMONIUM CHLORIDE	RH.
1-DODECYLPYRIDINIUM CHLORIDE	DAN, X.
(ETHYLBENZYL)DIMETHYL(MIXED ALKYL)AMMONIUM CHLORIDE	BRD.
1-(MIXED ALKYL)QUINOLINIUM ETHYL SULFATE	DEX.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C A T I O N I C - C O N T I N U E D	
@QUATERNARY AMMONIUM SALTS, NOT CONTAINING OXYGEN--CON.	
@BENZENOID--CONTINUED	
QUATERNARY AMMONIUM SALTS NOT CONTAINING OXYGEN, CYCLIC, ALL OTHER	CCL, FIN, ICI, SCP.
OTHER CATIONIC SURFACE-ACTIVE AGENTS:	
MIXED SUBSTITUTED OXIMES	GNM.
TALLOW AMINE, ETHOXYLATED AND PROPOXYLATED, METHYL SULFATE	DUP.
TALLOW AMINE, ETHOXYLATED, QUATERNARY AMMONIUM SALT	DUP.
CATIONIC SURFACE-ACTIVE AGENTS, ALL OTHER	APX, WTC.
N O N I O N I C	
@CARBOXYLIC ACID AMIDES:	
@DIETHANOLAMINE CONDENSATES (AMINE/ACID RATIO = 2/1):	
CAPRIC ACID	SCP, TCH.
CASTOR OIL ACIDS	CGY, CLI, NTL, PC(E).
@COCONUT OIL ACIDS	ACT, AKS, ARD, ARL, AZS, BRD, BSW, CCL, CIN, CLI, CRT, CTL, DA, DEP, ECC, HRT, KNP, LUR(E), MCP, MOA, MRV, PC(E), PEK, PG, PVO, RCD, SBC, SCP, STP, TCH, VAL, VND, WTC, X.
@COCONUT OIL AND TALLOW ACIDS	AZS, CLI, ESS, MOA, PG, SCP, UNN.
@LAURIC ACID	BRD, CLI, DA, HRT, MOA, SOS.
LAURIC AND MYRISTIC ACIDS	HRT, MOA, PG, RCD, SBC, STP, TCH.
@LINOLEIC ACID	HRT, KNP, VND.
@OLEIC ACID	CCW, CLI, EMR, PVO, SBC, SCP, STP, TCH.
PELARGONIC ACID	TCH.
SOYBEAN OIL ACIDS	MOA.
@STEARIC ACID	CLI, CTL, ONX, SCO, VAL.
@TALL OIL ACIDS	MOA, SOS, WTC.
TALLOW ACIDS	HRT, SOS.
DIETHANOLAMINE CONDENSATES (AMINE/ACID = 2/1), ALL OTHER	SCP.
@DIETHANOLAMINE CONDENSATES (AMINE/ACID RATIO = 1/1):	
CAPRIC ACID	MOA.
@COCONUT OIL ACIDS	ARD, AZS, CGY, CHP, CLI, CON, CTL, DA, HLI, JRG, MOA, MRV, ONX, PIL, SBC, SCP, STP, TCC, WTC.
ISOSTEARIC ACID	MOA.
@LAURIC ACID	ARD, AZS, CLI, EFH, HLI, LEV, MOA, ONX, SBC, SCP, TCH.
LAURIC AND MYRISTIC ACID	CLI, SBC, SCP.

SURFACE-ACTIVE AGENTS 253

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
N O N I O N I C - C O N T I N U E D	
@CARBOXYLIC ACID AMIDES--CONTINUED	
@DIETHANOLAMINE CONDENSATES (AMINE/ACID RATIO = 1/1)--CONTINUED	
LINOLEIC ACID	EMK(E), SBC.
MYRISTIC ACID	MOA.
OLEIC ACID	EFH, HLI, SBC.
PALMITIC AND STEARIC ACIDS	MOA.
SOYBEAN OIL ACIDS	MOA.
@STEARIC ACID	AZS, CGY, CHP, ECC, EFH, MRV, VPC.
TALL OIL ACIDS	RCC, EFH.
TALLOW ACIDS	EFH, MOA, RPC, TCH.
DIETHANOLAMINE CONDENSATES, AMINE/ACID RATIO=1/1, ALL OTHER	HLI, STP.
ALL OTHER CARBOXYLIC ACID AMIDES:	
ALKANOLAMINE CONDENSATES, ALL OTHER	SBC, TCH.
CARBOXYLIC ACID-ALKANOLAMINE CONDENSATE, ALKOXYLATED, ALL OTHER	PG.
CARBOXYLIC ACID-DIAMINE AND POLYAMINE CONDENSATE, ALL OTHER	HUM.
COCONUT OIL ACIDS (AMINE/ACID RATIO=14/1)	JRG.
COCONUT OIL ACIDS (AMINE/ACID RATIO=2/1)	STP, TCH, VND.
COCONUT OIL ACIDS (AMINE/ACID RATIO-1/1)	ARD, HLI, HUM, MOA, PG, SCP, STP, WTC.
COCONUT OIL ACIDS-ETHANOLAMINE CONDENSATE, ETHOXYLATED	STP.
DIETHANOLAMINE CONDENSATES, ALL OTHER	ORO.
ETHANOLAMINE CONDENSATES, ALL OTHER	EFH.
ISOPROPANOLAMINE CONDENSATES, ALL OTHER	EFH, SBC, WTC.
LAURIC ACID - ETHANOLAMINE CONDENSATE	MOA.
LAURIC ACID - ISOPROPANOLAMINE CONDENSATE	CLI, MOA, SNW.
LAURIC AND MYRISTIC ACIDS - ETHANOLAMINE CONDENSATE	MOA, SCP.
LAURIC AND MYRISTIC ACIDS - ISOPROPANOLAMINE CONDENSATE	LEV.
OLEIC ACID-ETHANOLAMINE CONDENSATE, ETHOXYLATED	DA, GAF.
PALMITIC ACID-DIETHANOLAMINE CONDENSATE, ALKOXYLATED	ROB.
STEARIC ACID-ETHANOLAMINE CONDENSATE (AMINE/ACID RATIO=2/1)	CLI, ECC.
STEARIC ACID-EHTANOLAMINE CONDENSATE (AMINE/ACID RATIO=1/1)	HAL, MOA, SBC, VND, WTC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC-CONTINUED	
@CARBOXYLIC ACID AMIDES--CONTINUED	
@ALL OTHER CARBOXYLIC ACID AMIDES--CONTINUED	
STEARIC ACID (RATIO = 1/2)	WTC.
STEARIC ACID-ETHYLENEDIAMINE CONDENSATE (AMINE/ACID RATIO=1/2)	DA.
@CARBOXYLIC ACID ESTERS:	
@ANHYDROSORBITOL ESTERS:	
ANHYDROSORBITOL DIOLEATE	ICI.
ANHYDROSORBITOL MONOESTER OF TALL OIL ACIDS	HDG, ICI.
ANHYDROSORBITOL MONOLAURATE	AAC, GLY, HDG, ICI, TCH.
ANHYDROSORBITOL MONO-OLEATE	GLY, HDG, ICI, TCH.
ANHYDROSORBITOL MONOPALMITATE	GLY, ICI, TCH.
ANHYDROSORBITOL MONOSTEARATE	GLY, ICI, PVO, TCH.
ANHYDROSORBITOL SESQUIOLEATE	GLY, TCH.
ANHYDROSORBITOL TRIESTER OF TALL OIL ACIDS	GLY.
ANHYDROSORBITOL TRIOLEATE	GLY, ICI, TCH.
ANHYDROSORBITOL TRISTEARATE	AAC, GLY, ICI, PVO, TCH.
ANHYDROSORBITOL ESTERS, ALL OTHER	CHP, ICI.
@DIETHYLENE GLYCOL ESTERS:	
@DIETHYLENE GLYCOL DISTEARATE	ARC, GLY, VAL.
DIETHYLENE GLYCOL MONOESTER OF COCONUT OIL ACIDS	DA.
DIETHYLENE GLYCOL MONOLAURATE	ECC, GLY, HAL, WM.
DIETHYLENE GLYCOL MONO-OLEATE	ARC, HAL.
DIETHYLENE GLYCOL MONORICINOLEATE	DA.
@DIETHYLENE GLYCOL MONOSTEARATE	ARC, CHP, CLI, HAL, HDG, VND.
DIETHYLENE GLYCOL SESQUIESTER OF TALL OIL ACIDS	ECC.
DIETHYLENE GLYCOL SESQUILAURATE	ARC, GLY.
DIETHYLENE GLYCOL SESQUISTEARATE	WTC.
@ETHOXYLATED ANHYDROSORBITOL ESTERS:	
ETHOXYLATED ANHYDROSORBITOL MONOLAURATE	AAC, GLY, HDG, ICI, MIL, PVO, TCH.
@ETHOXYLATED ANHYDROSORBITOL MONO-OLEATE	AAC, EMR, GLY, HDG, ICI, PVO, TCH.
ETHOXYLATED ANHYDROSORBITOL MONOPALMITATE	AAC, ICI.
@ETHOXYLATED ANHYDROSORBITOL MONOSTEARATE	AAC, EKT, GLY, HDG, ICI, PVO, TCH.
ETHOXYLATED ANHYDROSORBITOL TRIESTER OF TALL OIL ACIDS	GLY, ICI.
ETHOXYLATED ANHYDROSORBITOL TRIOLEATE	AAC, GLY, ICI, TCH.
ETHOXYLATED ANHYDROSORBITOL TRISTEARATE	AAC, GLY, HDG, ICI, TCH.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
N O N I O N I C - C O N T I N U E D	
@CARBOXYLIC ACID ESTERS--CONTINUED	
ETHOXYLATED SORBITOL ESTERS:	
ETHOXYLATED SORBITOL BEESWAX ESTER	ICI.
ETHOXYLATED SORBITOL HEXAESTER OF TALL OIL ACIDS	TCH.
ETHOXYLATED SORBITOL HEXAOLEATE	ICI, TCH.
ETHOXYLATED SORBITOL LANOLIN ESTER	ICI.
ETHOXYLATED SORBITOL MONO-OLEATE	ICI.
ETHOXYLATED SORBITOL PENTALAURATE	ICI.
ETHOXYLATED SORBITOL TETRAESTER OF LAURIC AND OLEIC ACIDS	ICI.
ETHOXYLATED SORBITOL TETRAOLEATE	ICI.
ETHOXYLATED SORBITOL ESTERS, ALL OTHER	ICI.
@ETHYLENE GLYCOL ESTERS:	
ETHYLENE GLYCOL DISTEARATE	ARC, EMR, HAL, HUM, TCH, WM.
ETHYLENE GLYCOL MONOSTEARATE	ARC, CLI, GLY, HAL, HDG, KNP, TCH, VND, WM.
@GLYCEROL ESTERS:	
@COMPLEX GLYCEROL ESTERS:	
GLYCEROL DIACETYLTARTRATE MONOSTEARATE	WTC.
GLYCEROL MONOESTER OF MIXED FATTY ACIDS, SUCCINYLATED	EKT.
COMPLEX GLYCEROL ESTERS, ALL OTHER	GLY, SCP, WM.
@GLYCEROL ESTERS OF CHEMICALLY DEFINED ACIDS:	
GLYCEROL DILAURATE	VND.
GLYCEROL DIOLEATE	ARC, HAL, X.
GLYCEROL DISTEARATE	APX.
GLYCEROL MONOCAPRYLATE	ARC, PVO.
@GLYCEROL MONOLAURATE	ARC, GLY, HAL.
@GLYCEROL MONO-OLEATE	ARC, CCW, EMR, GLY, GRO, HAL, HDG, PVO, TCH, WM, WTC.
GLYCEROL MONORICINOLEATE	GLY, HDG.
@GLYCEROL MONOSTEARATE	ARC, ASH, BLS, CHL, CIN, EMB, GLY, GRO, HAL, HRT, PVO, TCH, VND, WM, WTC.
GLYCEROL ESTERS OF CHEMICALLY DEFINED ACIDS, ALL OTHER	ARC.
@GLYCEROL ESTERS OF MIXED ACIDS:	
@GLYCEROL MONOESTER OF COCONUT OIL ACIDS	GLY, PVO, WTC.
GLYCEROL MONOESTER OF COTTONSEED OIL ACIDS	EKT.
@GLYCEROL MONOESTER OF HYDROGENATED COTTONSEED OIL ACIDS	EKT, LEV, WM.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC-CONTINUED	
@CARBOXYLIC ACID ESTERS--CONTINUED	
@GLYCEROL ESTERS--CONTINUED	
@GLYCEROL ESTERS OF MIXED ACIDS--CONTINUED	
@GLYCEROL MONOESTER OF HYDROGENATED SOYBEAN OIL ACIDS	BFP, EKT, GLD, PVO, TCH, WTC.
@GLYCEROL MONOESTER OF LARD ACIDS	EKT, GLY, PVO.
GLYCEROL MONOESTER OF PALM OIL ACIDS	EKT.
GLYCEROL MONOESTER OF PEANUT OIL ACIDS	GLD.
GLYCEROL MONOESTER OF SAFFLOWER OIL ACIDS	EKT.
GLYCEROL MONOESTER OF TALL OIL ACIDS	EKT, PER, WTC.
GLYCEROL MONOESTER OF TALLOW ACIDS	BFP.
GLYCEROL MONOESTER OF MIXED VEGETABLE OIL ACIDS	BFP, EKT, LEV.
GLYCEROL SESQUIESTER OF HYDROGENATED TALLOW ACIDS	JBG.
GLYCEROL ESTERS OF MIXED ACIDS, ALL OTHER	GLD, ICI, PG, SLM, TCH, WTC.
@NATURAL FATS AND OILS, ETHOXYLATED:	
@CASTOR OIL, ETHOXYLATED	AAC, DA, GAF, ICI, MIL, NLC, NTL, PVO, TCH, TMH.
CORN OIL, ETHOXYLATED	TCH.
HYDROGENATED CASTOR OIL, ETHOXYLATED	DA, ICI, TCH.
@LANOLIN, ETHOXYLATED	AAC, CRD, CRN, ICI, MIL, TCH.
OLEIC ACID, ETHOXYLATED	TMH.
TALL OIL ACIDS, ETHOXYLATED	DA, JCC, TCH.
NATURAL FATS AND OILS, ETHOXYLATED, ALL OTHER	ARC, MIL, TCH.
@POLYETHYLENE GLYCOL ESTERS:	
@POLYETHYLENE GLYCOL ESTERS OF CHEMICALLY DEFINED ACIDS:	
@POLYETHYLENE GLYCOL DILAURATE	ARC, DA, GLY, HAL, TCH, WM.
@POLYETHYLENE GLYCOL DIOLEATE	ARC, BRD, CGY, CLD, EFH, GLY, HAL, SLC, TCH, VND, WM.
@POLYETHYLENE GLYCOL DISTEARATE	ARC, CHP, GLY, HAL, HDG, SBC, TCH.
@POLYETHYLENE GLYCOL MONOLAURATE	ARC, BRD, CGY, DA, EFH, EMR, GLY, HAL, ICI, TCH, WM.
@POLYETHYLENE GLYCOL MONO-OLEATE	ARC, BRD, CCA, CIN, CLD, CRT, DA, DEX, EFH, GAF, GLY, HAL, HDG, MRV, ONX, SCP, TCH, WM.
POLYETHYLENE GLYCOL MONOPALMITATE	ICI, KNP.
@POLYETHYLENE GLYCOL MONOSTEARATE	ARC, ARL, CGY, CHP, CIN, CRT, DA, DEP, EFH, EMR, GAF, GLY, HAL, HRT, ICI, PC(E), PVO, SLC, SOS, TCH, WM, WTC.
POLYETHYLENE GLYCOL MONOTALLATE	PER.
POLYETHYLENE GLYCOL SESQUIOLEATE	EFH, TCH, WTC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC-CONTINUED	
@POLYETHYLENE GLYCOL ESTERS OF CHEMICALLY DEFINED ACIDS--CONTINUED	
POLYETHYLENE GLYCOL ESTERS OF CHEMICALLY DEFINED ACIDS, ALL OTHER	EPH, ICI, TCH.
@POLYETHYLENE GLYCOL ESTERS OF MIXED ACIDS:	
POLYETHYLENE GLYCOL DIESTER OF TALL OIL ACIDS	EPH, NLC.
POLYETHYLENE GLYCOL MONOESTER OF SOYBEAN OIL ACIDS	GLY, TCH.
POLYETHYLENE GLYCOL MONOESTER OF TALL OIL ACIDS	TCH.
POLYETHYLENE GLYCOL MONOESTER OF TALL OIL ACIDS, ETHOXYLATED	NLC.
POLYETHYLENE GLYCOL SESQUIESTER OF COCONUT OIL ACIDS	ARC, GLY, MRT(E), STC, VND, WTC.
POLYETHYLENE GLYCOL SESQUIESTER OF ROSIN ACIDS	HPC.
POLYETHYLENE GLYCOL SESQUIESTER OF TALL OIL ACIDS	ARC, AZS, ICI, SLM, SOS.
POLYETHYLENE GLYCOL SESQUIESTER OF TALLOW ACIDS	ARC.
POLYETHYLENE GLYCOL ESTERS OF MIXED ACIDS, ALL OTHER	ECC, EPH, GLD, ICI, MCP, TCH.
POLYGLYCEROL ESTERS:	
POLYGLYCEROL DISTEARATE	GLY.
POLYGLYCEROL MONO-OLEATE	HDG, PVO, VND, WTC.
POLYGLYCEROL MONOSTEARATE	PVO, TCH.
POLYGLYCEROL ESTERS, ALL OTHER	GLD, PVO, TCH, WTC.
@PROPANEDIOL ESTERS:	
1,2-PROPANEDIOL DIOLEATE	X.
1,3-PROPANEDIOL MONOESTER OF COCONUT OIL ACIDS	GLY, WM.
@1,2-PROPANEDIOL MONOLAURATE	ARC, PVO, SBC.
1,2-PROPANEDIOL MONO-OLEATE	HAL.
@1,2-PROPANEDIOL MONOSTEARATE	ARC, EPH, EKT, GLY, HAL, ICI, TCH, WM, WTC.
1,2-PROPANEDIOL SESQUIESTER OF HYDROGENATED TALLOW ACIDS	JRG.
PROPANEDIOL ESTERS, ALL OTHER	PVO, TCH.
OTHER CARBOXYLIC ACID ESTERS:	
CETYL PALMITATE	ROB.
DI-ISOBUTYLENE MALEATE	RH.
ETHOXYLATED 1,2-PROPANEDIOL MONOSTEARATE	ICI.
LAURIC ACID ESTER OF GLYCEROL AND ETHOXYLATED NONYLPHENOL	TCC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
N O N I O N I C - C O N T I N U E D	
OTHER CARBOXYLIC ACID ESTERS--CONTINUED	
METHYLGLUCOSIDE LAURATE	HDG.
PENTAERYTHRITOL STEARATE	VAL.
POLYALKYLENE GLYCOL ADIPATE	NLC.
CARBOXYLIC ACID ESTERS, ALL OTHER	ARC, CCW, HDG, STC, TCH.
@ETHERS:	
@BENZENOID ETHERS:	
ALKYLPHENOL-FORMALDEHYDE CONDENSATES, ALKOXYLATED, ALL OTHER	AAC.
DIISOBUTYLPHENOL, ETHOXYLATED	GAF.
DINONYLPHENOL, ETHOXYLATED	GAF, JCC, TCH.
@DODECYLPHENOL, ETHOXYLATED	DA, GAF, MON, TCH, TMH.
ISO-OCTYLPHENOL, ETHOXYLATED	AAC, DA, RH.
(MIXED ALKYL) PHENOL, ETHOXYLATED	MIL, RH, TCH.
(MIXED ALKYL) PHENOL, ETHOXYLATED, BUTYL ETHER	NTL.
(MIXED ALKYL) PHENOL-FORMALDEHYDE	ARC, NLC.
(MIXED ALKYL) PHENOXYPOLY(ETHYLENEOXY) ETHYL CHLORIDE	GAF.
@NONYLPHENOL, ETHOXYLATED	AZS, DA, EMR, GAF, HDG, ICI, JCC, MIL, MON, NLC, OMC, RH, STP, TCH, TMH, UCC, WTC.
NONYLPHENOL-FORMALDEHYDE, ALKOXYLATED	NLC.
NONYLPHENOXYPOLY(ETHYLENEOXY) ETHYL IODIDE	GAF.
NORMAL-OCTYLPHENOL, ETHOXYLATED	TCH, TMH.
TERT-OCTYLPHENOL-FORMALDEHYDE, ETHOXYLATED	ARC, DA, SDW.
@PHENOL, ETHOXYLATED	DA, GAF, ICI, TCH, UCC, WTC.
TETRADECYLPHENOL ETHOXYLATED	ORO.
TRIDECYLPHENOL, ETHOXYLATED	TCH.
XYLENOL, ETHOXYLATED	NLC.
BENZENOID ETHER, ALL OTHER	DA, EPH.
@NONBENZENOID ETHERS:	
@LINEAR ALCOHOLS, ALKOXYLATED:	
DECYL ALCOHOL,ETHOXYLATED	GAF, ICI, TCH, VPC, WTC.
DECYLOXYPOLY(ETHYLENEOXY) ETHYL CHLORIDE	GAF.
@DODECYL ALCOHOL, ETHOXYLATED	AAC, DUP(E), GAF, HDG, ICI, MIL.
@HEXADECYL ALCOHOL, ETHOXYLATED	AAC, EMR, ICI, TCH.
@OCTADECYL ALCOHOL, ETHOXYLATED	CRD, DUP, GAF, HDG, ICI, TCH, VPC.
@9-OCTADECENYL ALCOHOL, ETHOXYLATED	AAC, GAF, ICI, TCH.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC-CONTINUED	
@NONBENZENOID ETHERS--CONTINUED	
@LINEAR ALCOHOLS, ALKOXYLATED--CONTINUED	
OLEYL ALCOHOL, ETHOXYLATED	CRN.
WOOL WAX ALCOHOLS, ETHOXYLATED	CRD.
COCONUT OIL ALCOHOL, ETHOXYLATED	GLY, JCC, VPC.
DECYL AND OCTYL ALCOHOLS, ETHOXYLATED	GAF.
@MIXED LINEAR ALCOHOLS, ETHOXYLATED AND PROPOXYLATED	BAS, DUP, JCC, STP, TCH, UCC, WTC.
@MIXED LINEAR ALCOHOLS, ETHOXYLATED	AAC, BAS, CO, DUP, GAF, HDG, JCC, NLC, RH, SHC, STP, TCH, UCC, WTC.
PRIMARY ALCOHOLS, ETHOXYLATED	RH.
TALLOW ALCOHOL, ETHOXYLATED	AAC, JCC.
LINEAR ALCOHOLS, ALKOXYLATED, ALL OTHER	GAF, GLY, ICI, TCH.
@OTHER ETHERS AND THIOETHERS:	
CORN STARCH, PROPOXYLATED	VAL.
TERT-DODECYL MERCAPTAN, ETHOXYLATED	AAC.
GLUCOSIDE, ETHOXYLATED	RH.
GLYCERINE, ALKOXYLATED	NLC.
ISODECYL ALCOHOL, ETHOXYLATED	TCH.
MIXED ALCOHOLS, ETHOXYLATED	CRN, PVO.
POLY(MIXED ETHYLENE, PROPYLENE) GLYCOL	BAS, NLC, UCC.
POLYOXYALKYLENE GLYCOLS, ALKOXYLATED	NLC.
POLYPROPYLENE GLYCOL, ETHOXYLATED	NLC, WTC.
TRIDECYL ALCOHOL, ETHOXYLATED	AAC, DUP, GAF, ICI, JCC, MIL, MON, NLC, OMC, TCH, TMH.
TRIDECYL ALCOHOL, PROPOXYLATED AND ETHOXYLATED	JCC.
TRIMETHYLHEPTANOL, ETHOXYLATED	TCH.
TRIMETHYLNONYL ALCOHOL, ETHOXYLATED	HDG, UCC.
TRIMETHYLOLPROPANE, ALKOXYLATED	BAS, HDG.
ETHERS AND THIOETHERS, ALL OTHER	GLY, TCH.
OTHER NONIONIC SURFACE-ACTIVE AGENTS:	
OCTYL PHOSPHATE, ETHOXYLATED	DUP.
TRI(CASTOR OIL ALKYL) PHOSPHATE	GLY.
TRIMETHYLALPROPANE, ETHOXYLATED	DUP.
NONIONIC SURFACE-ACTIVE AGENTS, ALL OTHER	AIP, CHP, ICI, MIL.

TABLE 3.--SURFACE-ACTIVE AGENTS: DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of surface-active agents to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
AAC	Alcolac Chemical Corp.
ACT	Arthur C. Trask Co.
ACY	American Cyanamid Co.
AES	Penetone Corp.
AGP	Armour-Dial, Inc.
AIP	Air Products & Chemicals, Inc.
AKS	Arkansas Co., Inc.
APX	Apex Chemical Co., Inc.
ARC	Armak Co.
ARD	Ardmore Chemical Co.
ARL	Arol Chemical Products Co.
ASH	Ashland Oil, Inc., Ashland Chemical Co.
ASY	American Synthetic Rubber Corp.
ATR	Atlantic Richfield Co., ARCO Chemical Co.
AZS	AZS Corp., AZ Products Co. Div.
BAO	Bayoil Co., Inc.
BAS	BASF Wyandotte Corp.
BFP	Breddo Food Products Co., Inc.
BLA	Astor Products, Inc., Blue Arrow Div.
BLS	Life Savers, Inc.
BRD	Lonza, Inc.
BSW	Original Bradford Soap Works, Inc.
CCA	Interstab Chemical, Inc.
CCL	Catawba-Charlab, Inc.
CCW	Cincinnati Milacron Chemicals, Inc.
CEL	Celanese Corp., Celanese Coatings & Specialties Co., Wica Plant
CGY	Ciba-Geigy Corp.
CHL	Chemol, Inc.
CHP	C.H. Patrick & Co., Inc.
CIN	Cindet Chemicals, Inc.
CLD	Colloids, Inc.
CLI	Clintwood Chemical Co.
CO	Continental Oil Co.
CON	Concord Chemical Co., Inc.
CP	Colgate-Palmolive Co.
CRD	Croda, Inc.
CRN	CPC International, Inc., Amerchol
CRT	Crest Chemical Corp.
CRZ	Crown Zellerbach Corp., Chemical Products Div.
CST	Charles S. Tanner Co.
CTL	Continental Chemical Co.
CWP	Consolidated Papers, Inc.
DA	Diamond Shamrock Corp.
DAN	Dan River, Inc.
DEP	DePaul Chemical Co., Inc.
DEX	Dexter Chemical Corp.
DOW	Dow Chemical Co.
DUP	E.I. duPont de Nemours & Co., Inc.
DYS	Davies-Young Co.
ECC	Eastern Color & Chemical Co.
EFH	E.F. Houghton & Co.
EKT	Eastman Kodak Co., Tennessee Eastman Co. Div.
EMK	Emkay Chemical Co.
EMR	Emery Industries, Inc.
ENO	Enenco, Inc.
ESS	Essential Chemicals Corp.
FER	Ferro Corp., Keil Chemical Div.
FIN	Hexcel Corp., Fine Organics Div.
GAF	GAF Corp., Chemical Div.
GLD	SCM Corp., Durkee Div.
GLY	Glyco Chemicals, Inc.
GNM	General Mills Chemicals, Inc.
GRC	Chemed Corp., Dubois Chemicals Div.
GRD	W.R. Grace & Co., Polymer & Chemicals Div.
GRL	Chemed Co ., Vestal Laboratories, Inc.
GRO	A. Gross & Co., Millmaster Onyx Group, Kewanee Industries, Inc.
HAL	C.P. Hall Co.
HDG	Hodag Chemical Corp.
HEW	Hewitt Soap Co., Inc.
HK	Hooker Chemicals & Plastics Corp.
HL1	Haag Laboratories, Inc.
HMP	W.R. Grace & Co., Organic Chemicals Div.
HNT	Huntington Laboratories, Inc.
HPC	Hercules, Inc.
HRT	Hart Products Corp.
HUM	Kraft, Inc., Humko Products Div.
ICI	ICI United States, Inc., Specialty Chemicals Group
IMC	IMC Chemical Group, Inc.
JCC	Jefferson Chemical Co., Inc.
JOR	Jordan Chemical Co.
JRG	Andrew Jergens Co.
KAL	Pathan Chemical Co.
KNP	Knapp Products, Inc.
LAK	Lakeway Chemicals, Inc.
LEA	Leatex Chemical Co.
LEV	Lever Brothers Co.
LIL	Eli Lilly & Co.
LKY	Lake States Div. of St. Regis Paper Co.
LMI	North American Chemical Co.
LUR	Laurel Products Corp.
MAR	American Can Co., Wood Chemicals Div.
MCP	Moretex Chemical Products, Inc.
MIL	Milliken & Co., Milliken Chemical Div.
MIR	Miranol Chemical Co., Inc.
MOA	Mona Industries, Inc.
MON	Monsanto Co.

TABLE 3.--SURFACE-ACTIVE AGENTS: DIRECTORY OF MANUFACTURERS, 1976--CONTINUED

Code	Name of company	Code	Name of company
MRA	Bostik South, Inc.	SEA	Seaboard Chemicals, Inc.
MRD	Marden-Wild Corp.	SFS	Stauffer Chemical Co., Specialty Div.
MRT	Morton Chemical Co. Div. of Morton Norwich Products, Inc.	SHC	Shell Oil Co., Shell Chemical Co. Div.
		SID	George F. Siddall Co., Inc.
MRV	Marlowe-Van Loan Corp.	SLC	Soluol Chemical Co., Inc.
		SLM	Salem Oil & Grease Co.
NCW	Nostrip Chemical Works, Inc.	SM	Mobil Oil Corp., Mobil Chemical Co., Chemical Coatings Div.
NES	Nease Chemical Co., Inc.		
NLC	Nalco Chemical Co.	SNW	Sun Chemical Corp., Chemicals Div.
NMC	National Milling & Chemical Co., Inc.	SOC	Standard Oil Co. of California, Chevron Chemical Co.
NPR	Safeway Stores, Inc.		
NTL	NL Industries, Inc.	SOP	Southern Chemical Products Co., Inc.
NW	Northwestern Chemical Co.	SOS	Southern Sizing Co.
		SPA	Scott Paper Co.
OMC	Olin Corp.	STC	American Hoechst Corp., Sou-Tex Works
ONX	Millmaster Onyx Corp., Onyx Chemical Co.	STP	Stepan Chemical Co.
ORO	Chevron Chemical Co.	TCC	Tanatex Chemical Corp.
		TCH	Emery Industries, Inc., Trylon Div.
PC	Proctor Chemical Co., Inc.		
PCH	Peerless Chemical Co.	TCI	Texize Chemical Co.
PEK	Peck's Products Co.	TEN	Cities Service Co., Copperhill Operations
PFZ	Pfizer, Inc.	TMH	Thompson-Hayward Chemical Co.
PG	Procter & Gamble Co. and Procter & Gamble Paper Products Co.	TNA	Ethyl Corp.
		TNI	The Gillette Co., Chemical Div.
PIL	Pilot Chemical Co.	TXC	Tex Chem. Co.
PLX	Plex Chemical Corp.		
PNX	Murphy-Phoenix Co.	UCC	Union Carbide Corp.
PRX	Purex Corp.	UDI	Petrochemicals Co., Inc.
PSP	Georgia-Pacific Corp., Bellingham Div.	UNN	United Chemical Corp. of Norwood
PVO	PVO International, Inc.	UNP	United Chemical Products Corp.
		USR	Uniroyal, Inc., Chemical Div.
QCP	Quaker Chemical Corp.		
		VAL	Valchem
RAY	ITT Rayonier, Inc.	VND	Van Dyk & Co., Inc.
RBC	Fike Chemicals, Inc.	VPC	Mobay Chemical Corp., Verona Div.
RCD	Richardson Co., Organic Chemical Div.		
RH	Rohm & Haas Co.	WAW	W.A. Wood Co.
ROB	Robeco Chemicals, Inc.	WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.
RPC	Millmaster Onyx Corp., Refined-Onyx Div.		
		WBG	White & Bagley Co.
S	Sandoz, Inc., Sandoz Colors & Chemical Div.	WHI	White & Hodges, Inc.
SBC	Scher Bros. Inc.	WHW	Whittemore-Wright Co., Inc.
SBP	Sugar Beet Products Co.	WM	Inolex Corp.
SCO	Scholler Bros., Inc.	WTC	Witco Chemical Co., Inc.
SCP	Henkel, Inc.	WVA	Westvaco Corp., Chemicals Div., Polychemicals Dept.
SDC	Martin-Marietta Corp., Sodyeco Div.		
	Sterling Drug, Inc.:		
SDH	Hilton-Davis Chemical. Div.		
SDW	Winthrop Laboratories Div.		

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

PESTICIDES AND RELATED PRODUCTS

Edmund Cappuccilli

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 thus exclude such materials as diluents, emulsifiers, and wetting agents.

U.S. production of pesticides and related products in 1976 amounted to 1,364 million pounds--14.9 percent less than the 1,603 million pounds reported for 1975 (table 1).[1] Sales in 1976 were 1,193 million pounds, a decrease of 10.2 percent, as compared with 1,328 million pounds reported in 1975; the value of sales was $2,410 million in 1976, compared with $2,366 million in 1975--a small increase of 1.8 percent.

The output of cyclic pesticides and related products amounted to 940 million pounds in 1976--21.4 percent less than the 1,196 million pounds produced in 1975. Sales in 1976 were 839 million pounds, valued at $1,844 million, compared with 965 million pounds, valued at $1,891 million in 1975. Production of acyclic pesticides and related products in 1976 amounted to 424 million pounds, compared with 407 million pounds reported for 1975, an increase of 4.3 percent. Sales in 1976 were 354 million pounds, a decrease of about 2.6 percent, as compared with 363 million pounds reported in 1975; the value of sales was $566 million in 1976, compared with $475 million in 1975--an increase of 19.1 percent.

[1] See also table 2 which lists these products and identifies the manufacturers by codes. These codes are given in table 3.

Pesticides

In 1976, while other sectors of the chemical industry were rebounding from the recession of 1975, the production of synthetic organic pesticides decreased by approximately 15 percent. The quantity of sales also declined from the 1975 figures by 10 percent. The value of sales, however, remained at its 1975 level as the average unit value for pesticides increased from $1.78 in 1975 to $2.02 in 1976.

Weather conditions in various parts of the country and surplus inventories in the hands of both distributors and consumers are the causal factors behind the declines in production and in the quantity of sales. These factors, which depressed the industry in 1976, were temporary, and the statistics for 1977 should show improvement. The value of sales in 1976 (and 1977) has shown signs of slowing down as compared with previous years' increases. In 1974 and 1975, increases were approximately 32 percent per year while the unit values went from $1.33 to $1.78. These earlier increases were attributed principally to higher costs for fuel, labor, transportation, and raw materials which were often in short supply.

Herbicides

Herbicides were again the leading class of pesticides produced in the United States in 1976, accounting for approximately 50 percent of the total pesticides production as compared with 49 percent of the total in 1975. Herbicides' share of the total pesticide market in 1976 had earlier been estimated by industry to be much larger than 50 percent because of increased planting of certain crops in 1976. However, drought conditions in the Midwest and the West coupled with the price resistance of farmers all but eliminated the predicated larger increase. Production of most types of herbicides has been increasing over the past few years; however, for one class, the phenoxyacetic acids and their derivatives, production has been slowly declining. The main products in the group are 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), and their derivatives. In 1970, 10 companies were actively producing approximately 60 million pounds of these herbicides for consumption both here and abroad. By 1976, only seven companies were producing approximately the same amount of these herbicides while the total production of herbicides had increased from 404 million pounds in 1970 to over 800 million pounds in 1976. The two major reasons for the lack of growth of the phenoxyacetic acid herbicides are the increased use in the recent years of newer herbicides (e.g., triazine and urea-derivative herbicides), increased environmental controls, and greater competition by foreign pesticide producers.

Insecticides

The most significant trend in the production of insecticides in recent years has been the decrease of the organochlorine insecticides (e.g., DDT) and the rise in the production of the organophosphorous insecticides (e.g., methyl parathion). This trend is illustrated in the following graph. The decline in the output of the organochlorine-type of insecticides can be attributed to two major factors: (1) a decrease in product effectiveness, and (2) an increase in regulations by the Environmental Protection Agency (EPA). With regard to product effectiveness, it has become apparent that insects exposed to a certain insecticide over a long period of time begin to develop immunity to that insecticide. The use of alternate products, such as organophosphorus insecticides, every other year decreases the degree of immunity.

In 1972, the EPA banned the use of DDT in the United States except in cases of extreme infestation. Since then, that agency has banned or severely limited the use of several other chlorinated insecticides, among them aldrin, chlordane, dieldrin, heptachlor, and mirex. Additional organochlorine insecticides are under investigation by the EPA for possible restriction in the near future. Further restrictions and controls will decrease the production of organochlorine insecticides still further in the next few years.

The production of organophosphorous insecticides surpassed the production of organochlorine insecticides for the first time in 1975 as pesticides producers began to increase production of alternative insecticides for farm use to replace aldrin and dieldrin, which were banned in 1974. The production of other insecticides, mainly the organophosphorous compounds, should increase rapidly over the next several years.

Imports and foreign industry

During the past few years, imports of benzenoid pesticides (TSUS item 405.15) have increased at a dramatic rate. In 1975, 50.4 million pounds of pesticides were imported into the United States. This was a 78-percent increase over 1974 when only 28.3 million pounds were imported. In 1976, benzenoid pesticide imports amounted to 62.1 million pounds, an increase of 23 percent over 1975, and they accounted for 7 percent of domestic consumption.

A sharp decline in the level of domestic inventories of pesticides in 1974 was a major reason for the large increase in imports of pesticides in 1975 over 1974. This drop in inventories was attributed to the oil embargo which led to raw material shortages and a resultant slowdown in the production of pesticides. Inventories were more than restored in 1975. The unit values and prices of imports have also increased, owing to an increase in demand as well as increases in the costs of transportation and fuel. The following table shows the increase in the value of imported benzenoid pesticides which occurred between 1974 and 1975. The 1975 value of $97.1 million was 127 percent over the 1974 value. The value of imports in 1976 amounted to $128.8 million, an increase of 33 percent over that in 1975. It is expected that future increases in the value of pesticides will average about 10 to 15 percent per year.

For the past few years, imports of pesticides into the United States have come principally from four countries: Japan, Switzerland, the United Kingdom, and West Germany. As shown in the following table, these four countries have annually accounted for well over half of the imports under TSUS item 405.15 during the period 1973-76. From 1973 to 1975, United Kingdom producers annually allocated a large share of their expenditures to pesticide research and development. These producers have two distinct advantages over their U.S. counterparts in the area of research and development of new pesticides. First, it costs considerably less in the United Kingdom to develop a new pesticide than in the United States; approximately 50 percent less in some cases. Second, the United Kingdom has a more favorable working relationship between government and industry concerning the registration of new pesticides for public use. In addition, their firms aggresively market their new pesticide products in all the world markets, especially in the United States.

It does not seem likely that the growth of production and sale of pesticides in the future will match the gains of the past. Increasing pesticide prices caused by rising costs of raw materials, research, and Government registration will probably keep sales from rising at their previous rate. However, increased food production for both domestic and foreign markets and increased exports of pesticides to foreign markets should provide the industry with moderate growth in the near future.

U.S. Imports of pesticides, 1/ 1973-76

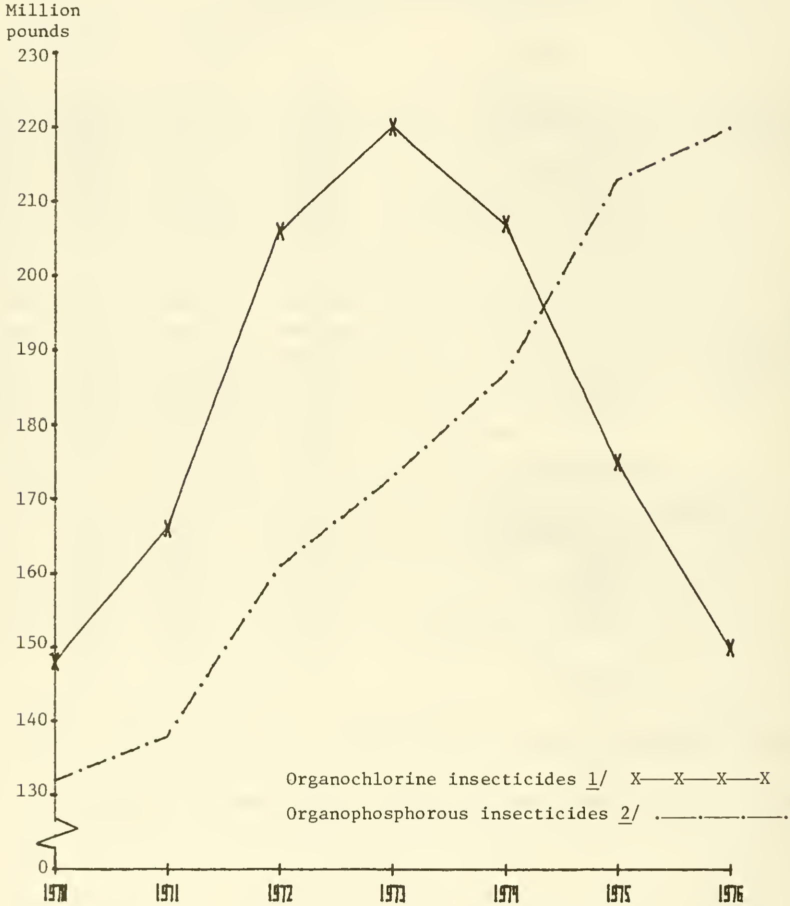
Principal sources of imports

	Source	1973	1974	1975	1976
Quantity (in 1,000 lbs)	United Kingdom	15,381	16,759	17,587	12,988
	West Germany	2,962	3,125	7,362	15,732
	Japan	3,634	2,293	3,922	5,613
	Switzerland	1,337	1,131	6,388	10,885
	Canada	987	1,793	4,842	2,289
	All other countries	4,550	3,241	10,315	14,607
	Total imports	28,851	28,342	50,416	62,114
Value (in $1,000)	United Kingdom	17,121	22,197	29,493	19,904
	West Germany	5,138	7,327	20,035	48,643
	Japan	3,936	3,210	6,323	10,599
	Switzerland	3,136	2,244	14,618	26,060
	Canada	1,011	1,728	5,043	3,383
	All other countries	4,526	6,032	21,615	20,244
	Total imports	34,868	42,738	97,127	128,833
Avg. unit value	United Kingdom	1.11	1.33	1.68	1.53
	West Germany	1.73	2.35	2.72	3.09
	Japan	1.08	1.40	1.61	1.89
	Switzerland	2.35	1.98	2.29	2.39
	Canada	1.02	.96	1.04	1.48
	All other countries	1.00	1.86	2.10	1.39
	Total imports	1.21	1.51	1.93	2.07

1/ TSUS item 405.15 only.

Source: Official statistics of the U.S. Department of Commerce.

Organochlorine insecticides and organophosphorous insecticides: U.S. production, 1970-76



1/ Includes aldrin, chlordan, DDT, dieldrin, endrin, heptachlor, and others.
2/ Includes acephate, diazinon, fonofos, methyl parathion, parathion, phorate, and others.

Source: Compiled from data contained in various U.S. International Trade Commission publications.

Note: Data are partially estimated.

PESTICIDES AND RELATED PRODUCTS

TABLE 1.--PESTICIDES AND RELATED PRODUCTS: U.S. PRODUCTION AND SALES, 1976

[Listed below are all pesticides and related products for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists all pesticides and related products for which data on production and/or sales were reported and identifies the manufacturers of each]

PESTICIDES AND RELATED PRODUCTS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	1,364,391	1,192,604	2,410,134	$2.02
Benzenoid	750,170	642,592	1,401,613	2.18
Nonbenzenoid	614,221	550,012	1,008,521	1.83
PESTICIDES AND RELATED PRODUCTS, CYCLIC				
Total	940,263	838,814	1,843,896	2.20
Fungicides, total	109,635	99,442	120,021	1.21
Naphthenic acid, copper salt	906	895	585	.65
Pentachlorophenol (PCP)	43,868	43,796	16,128	.37
Phenylmercuric acetate (PMA)	172	141	1,022	7.26
All other cyclic fungicides[2]	64,689	54,610	102,286	1.87
Herbicides and plant growth regulators, total	511,560	445,348	1,233,941	2.77
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	15,699	14,203	16,273	1.15
2,4-Dichlorophenoxyacetic acid, iso-octyl ester	8,361	3,022	2,763	.91
Plant growth regulators, total	7,522	7,759	19,070	2.46
1,2-Dihydro-3,6-pyridazinedione (Maleic hydrazide)	3,822	...	...	...
All other plant growth regulators	3,700	7,759	19,070	2.46
All other cyclic herbicides[3]	479,978	420,364	1,195,835	2.85
Insecticides and rodenticides, total	319,068	294,024	489,934	1.67
Organophosphorus insecticides[4]	114,325	98,162	210,561	2.15
Toxaphene(chlorinated camphene)	42,164	47,919	20,745	.43
All other cyclic insecticides and rodenticides[5]	162,579	147,943	258,628	1.75
PESTICIDES AND RELATED PRODUCTS, ACYCLIC				
Total	424,128	353,790	566,238	1.60
Fungicides, total	32,627	33,347	32,934	.99
Dithiocarbamic acid salts[6]	30,975	31,888	28,719	.90
All other acyclic fungicides[7]	1,652	1,459	4,215	2.89
Herbicides and plant growth regulators[8]	144,485	112,384	215,453	1.92
Insecticides, rodenticides, soil conditioners and fumigants, total	247,016	208,059	317,851	1.53
Methyl bromide (Bromomethane)	35,856	35,844	16,454	.46
S-Methyl-N-[(methylcarbamoyl)oxy] thioacetimidate (Methomyl)	14,328	...	...	...
Organophosphorus insecticides[9]	75,554	61,253	170,750	2.79
Trichloronitromethane (Chloropicrin)	6,423	5,773	2,865	.50
All other acyclic insecticides, rodenticides, soil conditioners and fumigants[10]	114,855	105,189	127,782	1.21

See footnotes on following page.

Footnotes for Table 1

[1] Calculated from rounded figures.
[2] Includes benomyl, captafol, captan, chlorothalonil, dinocap, DMTT, folpet, pentachloronitrobenzene, sodium pentachlorophenate, 2,4,5-trichlorophenol salts, all other phenylmercury compounds, and others.
[3] Includes alachlor, atrazine, barban, benefin, bensulide, 2,4-D acid (esters and salts), 2,4-DB, dicamba, dimethylurea compounds, dinitrophenol compounds, isopropyl phenylcarbamates (IPC and ClPC), MCPA, molinate, NPA, picloram, propanil, silvex and its esters, 2,4,5-T acid (esters and salts), triazines, trifluralin, uracils, and others.
[4] Includes carbophenothion, diazinon, dioxathion, fensulfothion, methyl parathion, parathion, ronnel, and other phosphorothioates and phosphorodithioates, and others.
[5] Includes carbaryl, carbofuran, chlorinated insecticides (BHC + lindane, chlordan, chlorobenzilate, DDT, dicofol, endosulfan, endrin, heptachlor, methoxyclor, and others), insect attractants, DEET and other insect repellents, small amounts of rodenticides, piperonyl butoxide and other synergists, and others.
[6] Includes ferbam, maneb, nabam, PETD, and zineb, plus the remaining dithiocarbamates which are used chiefly as fungicides.
[7] Includes dodine, and others.
[8] Includes cacodylic acid, CDAA, dalapon, methanearsonic acid salts, sodium TCA, thiocarbamates, thiolcarbamates, and organophosphorus herbicides, and others.
[9] Includes dichlorvos, disulfoton, ethion, malathion, monocrotophos, naled, phorate, and other organophosphorus insecticides.
[10] Includes DBCP, soil conditioners and fumigants, aldicarb, small quantities of rodenticides, and others.

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

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AND "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C	
@FUNGICIDES:	
2,6-BIS(DIMETHYLAMINOMETHYL)CYCLOHEXANONE	MRK.
1,4-DICHLORO-2,5-DIMETHOXYBENZENE	DUP.
1,2-DIHYDRO-6-ETHOXY-2,2,4-TRIMETHYLQUINOLINE (ETHOXYQUIN)	MON.
5-ETHOXY-3-(TRICHLOROMETHYL)-1,2,4-THIADIAZOLE	OMC, VNC.
HEXAHYDRO-1,3,5-TRIETHYL-S-TRIAZINE	CHG.
MERCAPTOBENZOTHIAZOLE, ZINC SALT	VNC.
METHYL-1-(BUTYLCARBAMOYL)-2-BENZIMIDAZOLECARBAMATE (BENOMYL)	DUP.
2-(1-METHYL-NORMAL-HEPTYL)-4,6-DINITROPHENYL CROTONATE	RH.
3-(2-METHYLPIPERIDINO)PROPYL 3,4-DICHLOROBENZOATE (PIPERALIN)	LIL.
@NAPHTHENIC ACID,COPPER SALT	CCA, MCI, TRO, WTC, X.
PENTACHLORONITROBENZENE	OMC, OTC(E).
@PENTACHLOROPHENOL	DOW, FRO, MON, RCI.
PENTACHLOROPHENOL, POTASSIUM SALT	NLC.
PENTACHLOROPHENOL,SODIUM SALT	DOW.
8-QUINOLINOL(8-HYDROXYQUINOLINE),COPPER SALT	ASH, X.
CIS-N-*(1,1,2,2-TETRACHLOROETHYL)THIO*-1-CYCLOHEXENE-1,2-DICARBOXIMIDE (CAPTAFOL)	ORO.
2,4,5,6-TETRACHLOROISOPHTHALCNITRILE	DA.
TETRAHYDRO-3,5-DIMETHYL-2H-1,3,5-THIADIAZINE-2-THIONE	MRK, VCC.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINURD

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@FUNGICIDES--CONTINUED	
MERCURY FUNGICIDES:	
@PHENYLMERCURIC ACETATE (PMA)	CLY, MRK, TRO.
PHENYLMERCURIC AMMONIUM ACETATE	TRO.
PHENYLMERCURIC OLEATE	TRO.
PHENYLMERCURIC PROPIONATE	MRK.
N-TRICHLOROMETHYLTHIO-4-CYCLOHEXENE-1,2-DICARBOXIMIDE	SFA, SFC, X.
N-TRICHLOROMETHYLTHIOPHTHALAMIDE	SFA, SFC.
2,4,5-TRICHLOROPHENOL ACID AND SALTS:	
2,4,5-TRICHLOROPHENOL	DOW.
2,4,5-TRICHLOROPHENOL, SODIUM SALT	DOW, GAF.
2,4,5-TRICHLOROPHENOL, POTASSIUM SALT	NLC.
1,3,5-TRI(2-ISOPROPANOL)-5-TRIAZINE	EFH.
CYCLIC FUNGICIDES, ALL OTHER	X.
@HERBICIDES AND PLANT GROWTH REGULATORS:	
3-AMINO-2,5-DICHLOROBENZOIC ACID, AMMONIUM SALT (2,5-DICHLORO-3-AMINOBENZOIC ACID, AMMONIUM SALT	AMC, GAF.
4-AMINO-6-(1,1-DIMETHYLETHYL)-3-(METHYLTHIO)-1,2,4-TRIAZIN-5-(4H)-ONE	CFG.
4-AMINO-3,5,6-TRICHLOROPICOLINIC ACID (PICLORAM)	DOW.
2,4-BIS(ISOPROPYLAMINO)-6-(METHYLTHIO)-S-TRIAZINE (PROMETRYN)	CGY.
4,6-BIS(ISOPROPYLAMINO)-2-METHOXY-S-TRIAZINE (PROMETON)	CGY.
5-BROMO-3-SEC-BUTYL-6-METHYLURACIL (BROMOCIL)	DUP.
2-(TERT-BUTYLAMINO)-4-CHLORO-6-(ETHYLAMINO)-S-TRIAZINE	CGY.
2-(TERT-BUTYLAMINO)-4-ETHYLAMINO-6-METHOXY-S-TRIAZINE	CGY.
2-(TERT-BUTYLAMINO)-4-ETHYLAMINO-6-METHYLTHIO-S-TRIAZINE	CGY.
N-SEC-BUTYL-4-TERT-BUTYL-2,6-DINITROANILINE	AMC.
3-TERT-BUTYL-5-CHLORO-6-METHYLURACIL	DUP.
N-BUTYL-N-ETHYL-ALPHA,ALPHA,ALPHA-TRIFLUORO-2,6-DINITRO-PARA-TOLUIDINE	LIL.
2-BUTYNYL-4-CHLORO-META-CHLORCCARBANILATE	GOC.
2-CHLORO-4,6-BIS(ETHYLAMINO)-S-TRIAZINE	CGY.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@HERBICIDES AND PLANT GROWTH REGULATORS--CONTINUED	
2-CHLORO-4,6-BIS(ISOPROPYLAMINO)-2-TRIAZINE (PROPAZINE)	CGY.
2-CHLORO-2',6'-DIETHYL-N-(NORMAL-BUTOXYMETHYL)ACETANILIDE	MON.
2-CHLORO-2',6'-DIETHYL-N-(METHOXYMETHYL)ACETANILIDE (ALACHLOR)	MON.
2-CHLORO-4-ETHYLAMINO-6-ISOPROPYLAMINO-S-TRIAZINE (ATRAZINE)	CGY, VTC.
2-(4-CHLORO-6-(ETHYLAMINO)-S-TRIAZIN-2-YLAMINO)-2-METHYLPROPIONITRILE	CGY, SHC, VTC.
N-(2-CHLOROETHYL)-ALPHA,ALPHA,ALPHA-TRIFLUORO-2,6-DINITRO-N-PROPYL-PARA-TOLUIDINE	BAS.
2-CHLORO-N-ISOPROPYLACETANILIDE	DOW, MON.
4-CHLORO-5-(METHYLAMINO)-2-(ALPHA, ALPHA, ALPHA-TRIFLUORO-META-TOLYL)-3-(2H)-PYRIDAZINONE (NORFLURAZON)	S.
4-(4-CHLORO-2-METHYLPHENOXY)BUTYRIC ACID	RDA.
3-(PARA-CHLOROPHENYL)-1,1-DIMETHYLUREA	DUP.
3-CYCLOHEXYL-6-(DIMETHYLAMINO)-1-METHYL-1,3,5-TRIAZINE-2,4-(1H,3H)-DIONE	DUP.
N-(CYCLOPROPYLMETHYL)-ALPHA,ALPHA,ALPHA-TRIFLUORO-2,6-DINITRO-N-PROPYL-P-TOLUIDINE	CGY.
3,6-DICHLORO-2-ANISIC ACID	VEL.
4-(2,4-DICHLOROPHENOXY)BUTYRIC ACID	RDA.
4-(2,4-DICHLOROPHENOXY)BUTYRIC ACID, ISO-OCTYL ESTER	RDA.
3-(3,4-DICHLOROPHENYL)-1,1-DIMETHYLUREA	DUP.
3-(3,4-DICHLOROPHENYL)-1-METHOXY-1-METHYLUREA (LINURON)	DUP.
2,4-DICHLOROPHENYL PARA-NITROPHENYL ETHER	RH.
3',4'-DICHLOROPROPIONANILIDE (PROPANIL)	EGR, RH.
N4/,N4/-DIETHYL-ALPHA,ALPHA,ALPHA-TRIFLUORO-3,5-DINITROTOLUENE-2,4-DIAMINE-(DINITROAMINE)	X.
S-(O,O-DIISOPROPYL PHOSPHORODITHIOATE) ESTER OF N-(ALPHA-MERCAPTOETHYL)BENZENESULFONAMIDE (BENSULIDE)	SFA.
N,N-DIMETHYL-2,2-DIPHENYLACETAMIDE	CWN.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@HERBICIDES AND PLANT GROWTH REGULATORS--CONTINUED	
1,2-DIMETHYL-3,5-DIPHENYL-1H-PYRAZOLIUM METHYL SULFATE	LAK.
N-(1,1-DIMETHYL-2-PROPYNYL)-3,5-DICHLOROBENZAMIDE (PRONAMIDE)	RH.
DIMETHYL-2,3,5,6-TETRACHLOROTEREPHTHALATE	DA.
DINITROBUTYLPHENOL	DOW, FMN, VTC.
DINITROBUTYLPHENOL,AMMONIUM SALT	DOW.
DINITROBUTYLPHENOL,TRIETHANOLAMINE SALT	DOW, VTC.
DINITROCRESOL,SODIUM SALT	FMN.
5-ETHYL CYCLOHEXYLETHYLTHIOCARBAMATE	SFA.
2-(ETHYLAMINO)-4-(ISOPROPYLAMINO)-6-(METHYLTHIO)-S-TRIAZINE (AMETRYNE)	CGY.
S-ETHYL-HEXAHYDRO-1H-AZEPINE-1-CARBOTHIOATE (MOLINATE)	SFA.
N-(1-ETHYLPROPYL)-3,4-DIMETHYL-2,6-DINITROBENZENAMINE	X.
2-ETHYLTHIO-4,6-BIS(ISOPROPYLAMINO)-S-TRIAZINE	CGY.
3-ISOPROPYL-1H-2,1,3-BENZOTHIADIAZIN-4(3H)-ONE 2,2-DIOXIDE	BAS.
ISOPROPYL N-(3-CHLOROPHENYL)CARBAMATE	PPG.
ISOPROPYL N-PHENYLCARBAMATE	PPG.
1-(2-METHYLCYCLOHEXYL)-3-PHENYLUREA	DUP.
METHYL 5-(2',4'-DICHLOROPHENOXY)-2-NITROBENZOATE	RDA, SM.
4-(METHYLSULFONYL)-2,6-DINITRO-N,N-DIPROPYLANILINE (NITRALIN)	SHC.
1-NAPHTHYLPHTHALAMIC ACID	USR.
7-OXABICYCLO-*2.2.1*-HEPTANE-2,3-DICARBOXYLIC ACID,DISODIUM SALT	PAS.
PHENOXYACETIC ACID DERIVATIVES:	
4-CHLORO-2-METHYLPHENOXYACETIC ACID	CLY, RDA, RIV, TMH.
4-CHLORO-2-METHYLPHENOXYACETIC ACID, DIMETHYLAMINE SALT	RDA.
4-CHLORO-2-METHYLPHENOXYACETIC ACID, ISO-OCTYL ESTER	RDA.
2,4-DICHLOROPHENOXYACETIC ACID	DOW, RDA.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@HERBICIDES AND PLANT GROWTH REGULATORS--CONTINUED	
PHENOXYACETIC ACID DERIVATIVES--CONTINUED	
2,4-DICHLOROPHENOXYACETIC ACID, ESTERS AND SALTS:	
2,4-DICHLOROPHENOXYACETIC ACID, BUTOXY ETHANOL ESTER	DOW.
2,4-DICHLOROPHENOXYACETIC ACID,BUTOXYPOLYPROPYLENEGLYCOL ESTER	DOW.
2,4-DICHLOROPHENOXYACETIC ACID,NORMAL-BUTYL ESTER	RIV.
2,4-DICHLOROPHENOXYACETIC ACID,SEC-BUTYL ESTER	DOW.
@2,4-DICHLOROPHENOXYACETIC ACID,DIMETHYLAMINE SALT	DOW, RDA, RIV, TMH.
2,4-DICHLOROPHENOXYACETIC ACID,ETHANOLAMINE AND ISOPROPANOLAMINE SALTS	DOW.
2,4-DICHLOROPHENOXYACETIC ACID, ISOBUTYL ESTER	RDA.
@2,4-DICHLOROPHENOXYACETIC ACID,ISO-OCTYL ESTER	DOW, RDA, RIV, TMH.
2,4-DICHLOROPHENOXYACETIC ACID,SODIUM SALT	DOW.
2,4,5-TRICHLOROPHENOXYACETIC ACID, ESTERS AND SALTS	
2,4,5-TRICHLOROPHENOXYACETIC ACID, BUTOXY ETHANOL ESTER	DOW.
2,4,5-TRICHLOROPHENOXYACETIC ACID,BUTOXYPOLYPROPYLENEGLYCOL ESTER	DOW.
2,4,5-TRICHLOROPHENOXYACETIC ACID, SEC-BUTYL ESTER	DOW.
2,4,5-TRICHLOROPHENOXYACETIC ACID,ISO-OCTYL ESTER	DOW, RIV, TMH.
2,4,5-TRICHLOROPHENOXYACETIC ACID, TRIETHYLAMINE SALT	DOW.
@PLANT GROWTH REGULATORS:	
2-CHLORO-6-(TRICHLOROMETHYL)PYRIDINE	DOW, GAF.
2,4-DICHLOROBENZYLTRIBUTYLPHOSPHONIUM CHLORIDE	SM.
@1,2-DIHYDRO-3,6-PYRIDAZINEDIONE (MALIC HYDRAZIDE)	ACY, ASL, CHP, FMT, USR.
GIBBERELLIC ACID	ABB, MRK.
3-INDOLEBUTYRIC ACID	ARA, MRK.
1-NAPHTHALENEACETAMIDE	AMC.
1-NAPHTHALENEACETIC ACID	GNW.
1-NAPHTHALENEACETIC ACID, SODIUM SALT	BKL, GNW.
PLANT GROWTH REGULATORS, CYCLIC, ALL OTHER	MMM, USR.
2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID	TMH.
2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID, 2-BUTOXYPOLYPROPYLENE ESTER	DOW.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
2-(2,4,5-TRICHLOROPHENOXY) PROPIONIC ACID, DIMETHYLAMINE SALT	RIV.
2-(2,4,5-TRICHLOROPHENOXY) PROPIONIC ACID, ISO-OCTYL ESTER	RIV.
ALPHA,ALPHA,ALPHA-TRIFLUORO-2,6-DINITRO-N,N-DIPROPYL-PARA-TOLUIDINE (TRIFLURALIN)	LIL.
CYCLIC HERBICIDES, ALL OTHER	MMM, VEL, X.
INSECT ATTRACTANTS AND REPELLENTS:	
TERT-BUTYL 4(OR 5)-CHLORO-2-METHYLCYCLOHEXANECARBOXYLATE	UOP.
N,N-DIETHYLTOLUAMIDE (DEET)	PFZ.
DI-NORMAL-PROPYLISOCINCHOMERONATE	MGK.
INSECTICIDES:	
3-(SEC-AMYLPHENYL)-N-METHYLCARBAMATE	X(E).
BACILIUS THURINGIENSIS	ABB, S.
(5-BENZYL-3-FURYL) METHYL-2,2-DIMETHYL-3-(2-METHYLPROPENYL) CYCLOPROPANE CARBOXYLATE	PEN.
2,3,4,5-DELTA2/-BUTENYLENE-TETRAHYDROFURFURAL	ORO, PLC.
CHLORINATED INSECTICIDES:	
ORTHO-CHLOROPHENYL-N-METHYLCARBAMATE	OTC(E).
PARA-CHLOROPHENYL 2,4,5-TRICHLOROPHENYL SULPONE (TETRADIFON)	FMN.
1,1-DICHLORO-2,2-BIS(PARA-ETHYLPHENYL) ETHANE	CHF, RH.
4,4'-DICHLORO-ALPHA-TRICHLOROMETHYLBENZHYDROL (DICOFOL)	RH.
ETHYL 4,4'-DICHLOROBENZILATE	CGY.
HEPTACHLORO-TETRAHYDRO-ENDO-METHANOINDENE (HEPTACHLOR)	VEL.
1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE (BENZENE HEXACHLORIDE)	X.
1,2,3,4,5,6-HEXACHLOROCYCLOHEXANE, 100% GAMMA ISOMER -(LINDANE)	X.
HEXACHLOROEPOXYOCTAHYDRO-ENDO,ENDO-DIMETHANOPHTHALENE	VEL.
HEXACHLORO-HEXAHYDRO-METHANO-BENZODIOXATHIEPIN 3-OXIDE	X.
OCTACHLOROHEXAHYDRO-4,7-METHANOINDENE	VEL.
@TOXAPHENE (CHLORINATED CAMPHENE)	HN, HPC, VTC.
1,1,1-TRICHLORO-2,2-BIS(PARA-CHLOROETHANE) (DDT)	MTO.
1,1,1-TRICHLORO-2,2-BIS(PARA-METHOXYPHENYL) ETHANE (METHOXYCHLOR)	CHF, DUP.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
INSECTICIDES--CONTINUED	
DISTANNOXANE, HEXAKIS (BETA,BETA-DIMETHYL-PHENETHYL)-	SHC.
META-(1-ETHYLPROPYL) PHENY METHYLCARBAMATE	ORO.
1-NAPHTHYL N-METHYLCARBAMATE	UCC.
@ORGANOPHOSPHORUS INSECTICIDES:	
O-(4-BROMO-2,5-DICHLOROPHENYL)-O-METHYL PHENYLPHOSPHONOTHIOATE-	VEL.
4-TERT-BUTYL-2-CHLOROPHENYL METHYL METHYLPHOSPHORAMIDATE-	DOW.
S-**(PARA-CHLOROPHENYL) THIO*METHYL* O,O-DIETHYL PHOSPHORODITHIOATE-	SPA.
2-CHLORO-1-(2,4,5-TRICHLOROPHENYL) VINYL DIMETHYL PHOSPHATE-	SHC.
O-(2,4-DICHLOROPHENYL) O-ETHYL S-PROPYL PHOSPHORODITHIOATE-	CHG.
2-(DIETHOXYPHOSPHINYLIMINO-4-METHYL-1,3-DITHIOLANE	ACY, X.
O,O-DIETHYL O-(2-ISOPROPYL-4-METHYL-6-PYRIMIDINYL) PHOSPHOROTHIOATE (DIAZINON)	CGY.
O,O-DIETHYL O-*4-(METHYLSULFINYL) PHENYL* PHOSPHOROTHIOATE	CHG.
O, O'-DIETHYL-O'-PYRAZINYL PHOSPHORODITHIDATE-	ACY.
O,O-DIETHYL O-(PARA-NITROPHENYL) PHOSPHOROTHIOATE (PARATHION)	MON.
O,O-DIETHYL O-3,5,6-TRICHLORO-2-PYRIDYL PHOSPHOROTHIOATE-	DOW.
O,O-DIMETHYL O-*4-(METHYLTHIO)-META-TOLYL*-PHOSPHOROTHIOATE	CHG.
O,O-DIMETHYL O-(PARA-NITROPHENYL) PHOSPHOROTHIOATE (METHYL PARATHION)	AMP, MON, SPA, VTC.
O,O-DIMETHYL S*4-OXO-1,2,3-BENZOTRIAZIN-3-(4H)-YLMETHYL*PHOSPHORODITHIOATE-	CHG.
O,O-DIMETHYL S-PHTHALIMIDOMETHYL PHOSPHORODITHIOATE	SPA.
O,O-DIMETHYL O-(2,4,5-TRICHLOROPHENYL) PHOSPHOROTHIOATE-	DOW.
2,3-PARA-DIOXANEDITHIOL S,S-BIS-(O,O-DIETHYL PHOSPHORODITHIOATE	HPC.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
C Y C L I C--CONTINUED	
@ORGANOPHOSPHORUS INSECTICIDE--CONTINUED	
O-ETHYL O-*4-(METHYLTHIO)PHENYL* S-PROPYL PHOSPHORODITHIOATE	CHG.
O-ETHYL O-(PARA-NITROPHENYL)PHENYLPHOSPHONOTHIOATE (EPN)	SFA, VEL.
O-ETHYL O-(2,4,5-TRICHLOROPHENYL)ETHYL PHOSPHONOTHIOATE	CHG.
2-IMINO-1,3-DITHIOLANE, DIHYDROGEN SULFATE	ACY.
O,O,O',O'-TETRAMETHYL-O,O'-THIODI-PARA-PHENYLENE PHOSPHOROTHIOATE	ACY.
ALL OTHER CYCLIC INSECTICIDES	ACN, FMN, HPC, KF, OTC, S, USR, X, X, X.
NEMATOCIDES:	
O,O-DIETHYL O-(2,4-DICHLOROPHENYL)PHOSPHOROTHIOATE (DICHLOFENTHION)	SM.
RODENTICIDES:	
2-DIPHENYLACETYL-1,3-INDANDIONE AND SODIUM SALT	NES.
2-PIVALOYL-1,3-INDANDIONE	PIC.
N-(3-PYRIDYLMETHYL)-N'-(PARA-NITROPHENYL)UREA	CWN.
RODENTICIDES, CYCLIC,ALL OTHER	X.
SYNERGISTS:	
ALPHA-*2-(2-NORMAL-BUTOXYETHOXY)-ETHOXY*-4.5-METHYLENEDIOXY-2-PROPYLTOLUENE (PIPERONYL BUTOXIDE)	ALP, FMN.
N-(2-ETHYLHEXYL)BICYCLO(2.2.1)-5-HEPTENE-2,3-DICARBOXIMIDE	MGK.
BENZYL BROMOACETATE	MRK.
4-BROMOACETOXYMETHYL-N-DIOXOLINE	EPH.
A C Y C L I C	
@FUNGICIDES:	
BIS-1,4-BROMOACETOXY-2-BUTENE	VIN.
CHLOROMETHOXYPROPYLMERCURIC ACETATE	TRO.
@DITHIOCARBAMIC ACID FUNGICIDES:	
DIMETHYLDITHIOCARBAMIC ACID,FERRIC SALT	PMN.
DIMETHYLDITHIOCARBAMIC ACID,MANGANESE SALT	PMN.
ETHYLENE BIS(DITHIOCARBAMIC ACID),DIAMMONIUM SALT	RBC.
ETHYLENE BIS(DITHIOCARBAMIC ACID),DISODIUM SALT (NABAM)	ALC, RH, USR.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C Y C L I C--CONTINUED	
@FUNGICIDES--CONTINUED	
ETHYLENE BIS(DITHIOCARBAMIC ACID), MANGANESE SALT (MANEB)	DUP, RH.
ETHYLENE BIS(DITHIOCARBAMIC ACID), MANGANESE SALT WITH ZINC IONS	RH.
ETHYLENE BIS(DITHIOCARBAMIC ACID), ZINC AND MANGANESE SALTS	DUP.
ETHYLENE BIS(DITHIOCARBAMIC ACID), ZINC SALT (ZINEB)	FMN, RH.
POLYETHYLENETHIURAM DISULFIDE	FMN.
NORMAL-DODECYLGUANIDINE	ACY, MRK.
METHYLENE BIS(THIOCYANATE)	MRK.
ACYCLIC FUNGICIDES, ALL OTHER	VCC.
@HERBICIDES AND PLANT GROWTH REGULATORS:	
N,N-BIS(PHOSPHONOMETHYL)GLYCINE	MON.
2-CHLOROALLYL DIETHYLDITHIOCARBAMATE	MON.
2-CHLORO-N,N-DIALLYLACETAMIDE	MON.
2-CHLOROETHYLTRIMETHYL AMMONIUM CHLORIDE	ACY.
2,2-DICHLOROPROPIONIC ACID, SODIUM SALT (DALAPON)	DOW.
DIMETHYLARSINIC ACID (CACODYLIC ACID)	ASL.
ETHYL CARBAMOYLPHOSPHONATE, AMMONIUM SALT	DUP.
S-ETHYL DIPROPYLTHIOCARBAMATE	SFA.
S-ETHYLDIISOBUTYLTHIOCARBAMATE	SFA.
ETHYL XANTHOGEN DISULFIDE	RBC.
METHANEARSONIC ACID, DISODIUM SALT (DSMA)	ASL, CLY, VIN.
METHANEARSONIC ACID, DODECYL- AND OCTYL- AMMONIUM SALTS	CLY.
METHANEARSONIC ACID, MONOSODIUM SALT (MSMA)	ASL, DA.
N-(PHOSPHONOMETHYL)GLYCINE, ISOPROPYLAMINE SALT	MON.
PLANT GROWTH REGULATORS:	
SUCCINIC ACID, 2,2-DIMETHYLHYDRAZIDE	USR.
S-PROPYL BUTYLETHYLTHIOCARBAMATE	SFA.
S-PROPYL DIPROPYLTHIOCARBAMATE	SFA.
S,S,S-TRIBUTYL PHOSPHOROTRITHIOATE	PLC.
TRIBUTYL PHOSPHOROTRITHIOATE	SM.
TRICHLOROACETIC ACID, SODIUM SALT (TCA)	DOW.
S-(2,3,3-TRICHLOROALLYL) DIISOPROPYLTHIOLCARBAMATE (TRIALLATE)	MON.
ACYCLIC HERBICIDES, ALL OTHER	LIL, S.
@INSECTICIDES:	
2-(2-BUTOXYETHOXY)ETHYL THIOCYANATE	RH.
METHYL N',N'-DIMETHYL-N-*(METHYLCARBAMOYL)OXY*-1-THIOOXAMIDATE	DUP.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S.PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
A C Y C L I C--CONTINUED	
@INSECTICIDES--CONTINUED	
@S-METHYL-N-*(METHYLCARBAMOYL)CXY*THIOACETIMIDATE (METHOMYL)	DUP, EGR, SHC.
2-METHYL-2-(METHYLTHIO)PROPIONALDEHYDE O-(METHYLCARBAMOYL)OXIME	CGY, SHC, UCC.
@ORGANOPHOSPHORUS INSECTICIDES:	
S-*1,2-BIS(ETHOXYCARBONYL)ETHYL*O,O-DIMETHYL PHOSPHORODITHIOATE	ACY.
2-CARBOMETHOXY-1-PROPEN-2YL DIMETHYL PHOSPHATE	SHC.
1,2-DIBROMO-2,2-DICHLOROETHYL DIMETHYL PHOSPHATE (NALED)	SHC.
O,O-DIETHYL S-*2-(ETHYLTHIO)ETHYL* PHOSPHORODITHIOATE	CHG.
O,O-DIETHYL S-*(ETHYLTHIO)METHYL* PHOSPHORODITHIOATE	ACY, CHG, X.
O,O-DIETHYL O-*2-(ETHYLTHIO)ETHYL* PHOSPHOROTHIOATE	CHG.
3-(DIMETHOXYPHOSPHINYLOXY)-N,N-DIMETHYL-CIS-CROTONAMIDE	SHC.
O,S-DIMETHYLACETYLPHOSPHORAMIDOTHIOATE	ORO.
O,O-DIMETHYL-O-2,2-DICHLOROVINYL PHOSPHATE (DDVP)	SHC.
DIMETHYL PHOSPHATE OF 3-HYDROXY-N-METHYL-CIS-CROTONAMIDE	SHC.
O,S-DIMETHYL PHOSPHORAMIDOTHIOATE	CHG.
O,O-DIMETHYL PHOSPHOROCHLORIDOTHIOATE	CHG.
S-*2-(ETHYLSULFINYL)ETHYL*O,O-DIMETHYL PHOSPHOROTHIOATE	CHG.
O,O,O',O'-TETRAETHYL S,S'-METHYLENE BIS-PHOSPHORODITHIOATE	FMN.
O,O,O,O-TETRA-NORMAL-PROPYLDITHIOPYROPHOSPHATE	SFA.
RODENTICIDES:	
2-HYDROXYETHYL NORMAL-OCTYL SULFIDE	PLC.
RODENTICIDES, ACYCLIC, ALL OTHER	PLC.
SODIUM FLUOROACETATE	RBC.
SOIL CONDITIONERS:	
POLYACRYLONITRILE,HYDROLYZED,SODIUM SALT	ACY.
SOIL FUMIGANTS:	
1,2-DIBROMO-3-CHLOROPROPANE	DOW, SHC, VEL.
1,3-DICHLOROPROPENE	DOW.
1,3-DICHLOROPROPENE,1,2-DICHLOROPROPANE	SHC.
O-ETHYL S,S-DIPROPYL PHOSPHORODITHIOATE	SM.
@METHYL BROMIDE (BROMOMETHANE)	AMP, DOW, GTL, VEL.
N-METHYLDITHIOCARBAMIC ACID,SODIUM SALT	SFA.
@TRICHLORONITROMETHANE (CHLOROPICRIN)	DOW, IMC, NLD.
SOIL FUMIGANTS, ETC., ALL OTHER	MRT(E).
ACYCLIC PESTICIDES AND RELATED PRODUCTS,ALL OTHER	MRK, NLC, TRO.

TABLE 3.--Pesticides and related products: Directory of manufacturers, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers of pesticides and related products that reported production or sales to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company	Code	Name of company
ABB	Abbott Laboratories	MGK	McLaughlin, Gormley & King Co.
ACN	Allied Chemical Corp., Agricultural Dept.	MMM	Minnesota Mining & Manufacturing Co.
ACY	American Cyanamid Co.	MON	Monsanto Co.
ALC	Alco Chemical Corp.	MOT	Motomco, Inc.
ALP	Alpha Laboratories, Inc.	MRK	Merck & Co., Inc.
AMC	Amchem Products, Inc. Div. of Rorer-Amchem, Inc.	MRT	Morton Chemical Co., Div. of Morton Norwich Products, Inc.
AMP	Kerr-McGee Chemical Corp.	MTO	Montrose Chemical Corp. of California
ARA	Arapahoe Chemical, Inc. Sub. of Syntex Corp. (U.S.A.)	NES	Nease Chemical Co., Inc
ASH	Ashland Oil, Inc., Ashland Chemical Co.	NLC	Nalco Chemical Co.
ASL	Ansul Chemical Co.	NLO	Niklor Chemical Co.
BKL	Kewanee Industries, Inc., Millmaster Chemical Co. Div.	OMC	Olin Corp.
BKM	Buckman Labs., Inc.	ORO	Chevron Chemical Co.
CCA	Interstab Chemical, Inc.	OTC	Story Chemical Corp.
CGY	Ciba-Geigy Corp., Agricultural Div.	PAS	Pennwalt Corp.
CHF	Chemical Formulators, Inc.	PCW	Pfister Chemical, Inc.
CHG	Mobay Chemical Corp., Chemagro Agricultural Div.	PD	Parke, Davis & Co. Sub of Warner-Lambert Co.
CLY	W. A. Cleary Corp.	PEN	CPC International, Inc., Penick Div.
CWN	Upjohn Co., Fine Chemical Div.	PFZ	Pfizer, Inc.
DA	Diamond Shamrock Corp.	PIC	Pierce Organics, Inc.
DOW	Dow Chemical Co.	PLC	Phillips Petroleum Co.
DUP	E. I. duPont de Nemours & Co., Inc.	PPG	PPG Industries, Inc.
EFH	E. F. Houghton & Co.	RBC	Fike Chemicals, Inc.
EGR	Eagle River Chemical Corp.	RCI	Reichhold Chemicals, Inc.
FER	Ferro Corp., Ferro Chemical Div.	RDA	Rhodia, Inc.
FMN	FMC Corp., Agricultural Chemical Div.	RH	Rohm & Haas Co.
FMT	Fairmount Chemical Co.	RIV	Riverdale Chemical Co.
FRO	Vulcan Materials Co., Chemical Div.	S	Sandoz Inc., Crop Protection Dept.
GAF	GAF Corp., Chemical Div.	SDC	Martin-Marietta Corp., Sodyeco Div.
GNW	Greenwood Chemical Co.		Stauffer Chemical Co.:
GOC	Gulf Oil Corp., Gulf Oil Chemical Co. - U.S.	SFA	Agricultural Div.
GTH	Guth Chemical Co.	SFC	Calhio Chemicals, Inc. Div.
GTL	Great Lakes Chemical Corp.	SHC	Shell Oil Co., Shell Chemical Co. Div.
HK	Hooker Chemicals & Plastics Corp.	SM	Mobil Oil Corp., Mobil Chemical Co., Phosphorus Div.
HN	Tenneco Chemicals, Inc.	TMH	Thompson-Hayward Chemical Co.
HPC	Hercules, Inc.	TRO	Troy Chemical Corp.
IMC	IMC Chemical Group, Inc.	UCC	Union Carbide Corp.
KF	Kay-Fries Chemicals, Inc.	UOP	UOP, Inc., UOP Chemical Div.
LAK	Lakeway Chemicals, Inc.	USR	Uniroyal, Inc., Chemical Div.
LIL	Eli Lilly & Co.	VCC	Vinings Chemical Co.
MAL	Mallinckrodt Chemical Works	VEL	Velsicol Chemical Corp.
MCI	Mooney Chemical Corp.	VIN	Vineland Chemical Co.
		VNC	Vanderbilt Chemical Corp.
		VTC	Vicksburg Chemical Co. Div. of Vertac Consolidated
		WTC	Witco Chemical Co., Inc.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the appendix.

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

K. James O'Connor, Jr. and Thomas O'Connell

The Miscellaneous Chemicals section was extensively revised in 1976 to incorporate the proposed suggestions of an industry task force. Because there is a radical shift in the composition of this section as well as in many of the subgroups within this section, the 1976 data are not strictly comparable with previous reports. Production of the end-use groups contained within other sections generally increased over 1975 levels paralleling the organic sector as a whole. This section incorporates those end-use groups which are not readily classifiable within the prior sections of this report. Both cyclic and acyclic chemicals now fall with this section.

In 1976, the production of miscellaneous end-use chemicals exceeded 15.8 billion pounds. Sales in 1976 reached 9.2 billion pounds, valued at $2.3 billion. Polymers for fibers and urea collectively accounted for 84 percent of the 1976 production of these miscellaneous end-use chemicals. Urea, alone, accounted for 71 percent of the 1976 sales quantity of these chemicals although in terms of value it accounted for only 17 percent of the total value of merchant sales.

Production of gasoline additives for 1976 totalled 1.1 billion pounds. Sales exceeded 931 million pounds, valued at $736 million. The future growth of the lead additive portion of this market is seriously threatened by pending environmental legislation governing its use.

Methanol

Methanol production rebounds in 1976

In 1976, methanol ranked 20th among the 50 most important U.S. industrial chemicals with production in excess of 6.2 billion pounds. This volume represented a significant increase of 21.6 percent over the 1975 level of 5.2 billion pounds, a figure which reflected the doldrums that industrial chemical producers faced in the recession of 1975. Despite this encouraging increase in the 1976 production of methanol, it, nonetheless, lagged 1973 and 1974 output figures and remained slightly below the recent trend line shown in figure 1. On a more optimistic note, methanol fared better in 1976 than the organic chemicals sector as a whole, which registered an overall increase of 18 percent in production over the 1975 level.

Moderate growth of 5 to 6 percent projected for methanol

Industry sources are projecting, amid considerable speculation, that methanol production for nonfuel use will expand at a moderate rate of 5 to 6 percent a year for the remainder of this decade and into the early 1980's. These projections are predicated to some extent on the level of new housing starts reaching 1.5 to 2.0 million a year for the remainder of the decade. The correlation between methanol and the number of housing starts stems from methanol's major end use as an adhesive in the production of plywood and particle board, products which are sensitive to changes in the rate of new housing construction. On this score, methanol producers have reason to be encouraged with the renewed activity in the housing sector in recent months. In 1976, total new housing starts numbered 1.55 million, 32 percent more than in 1975. Through the first quarter of 1977, the 370,000 recorded new housing starts are well ahead of the 283,000 recorded in the first quarter of 1976 and dramatically ahead of the 194,000 recorded in the first quarter of 1975. 1/ Despite this upward trend, producers remain guarded in their projections, in that a sustained surge in housing construction will be largely dependent upon the Nation's ability to contain its inflation rate and to maintain a prime rate low enough to encourage new housing.

The 5 to 6 percent projected growth rate is also dependent upon the producers' ability to achieve moderate growth in methanol's other multiple commercial markets, such as the polyester fiber and solvent markets.

Domestic capacity expected to keep pace with projected demand through 1980

There is a general consensus among industry experts that new capacity additions scheduled for completion by 1980 will keep pace with projected

---

1/ U.S. Department of Commerce, Survey of Current Business, November 1976 (vol. 56, No. 11) and May 1977 (vol. 57, No. 5).

demand requirements. By 1980, U.S. capacity for methanol production is projected to reach 11 billion to 12 billion pounds a year, representing a 20-percent increase over current capacity levels. DuPont, alone, is scheduled to place a new plant with a capacity of 1.3 billion pounds a year on stream by 1980.

Domestic demand estimates, excluding methanol produced for fuel use, border on 8 billion pounds a year for 1980, representing an increase of 5 to 6 percent a year in the domestic demand for methanol.

Methanol may make inroads into new markets

There is continued speculation as to whether methanol will make new inroads into two potentially significant markets; one for clean-burning automotive fuel and the other for an intermediate in the production of a synthetic food source--single-cell protein.

In recent years methanol has undergone considerable testing for use in automotive fuel applications, the results of which have not to date been encouraging. However, testing continues, and industry sources forecast that if a breakthrough occurs, there will be a dramatic shift in the composition of the industry away from traditional chemical producers and toward the oil producers and refiners. The reason for this possible shift is that methanol (a primary chemical feedstock) is derived directly from natural gas, and is very close in the vertical chain to traditional oil producers' and refiners' markets. It must be pointed out, however, that such a breakthrough and consequential shift in production is certainly not expected over the short term and is questionable on a cost/performance basis over the long term.

The outlook is unclear for methanol's use as an intermediate in the production of single-cell protein, a product which is still very much in its experimental stages. The benefits of single-cell protein in alleviating some of the world's nutritional needs are potentially great, and one would expect significant markets to open for this product if technical and commercial difficulties can be overcome. Although inconclusive, current research indicates a leaning away from methanol as an intermediate in the production of single-cell protein in favor of ethanol.

Methanol imports on the rise

Imports of methanol for nonfuel use reached a record high of 277 million pounds valued at $8.5 million, in 1976, representing nearly a 150-percent increase by volume over the 1975 level. These imports supplied approximately 4 to 5 percent of domestic demand in 1976, or more than twice as much as in any other year in this decade; more than 70 percent come from Canada. Imperial Chemical Industries and Alberta Gas Chemicals are believed to be the major exporting companies to the United States.

According to Public Law 93-482, enacted October 26, 1974, methanol can be imported into the United States under TSUS item 427.96 free of duty (col. 1 rate) for fuel use or for use in producing synthetic natural gas. In 1976, 6.9 million pounds of methanol valued at $289,000 entered the United States under this category, a significant increase over the 3,700 pounds of methanol imported under this category in 1975.

Imports of methanol under the nonfuel use category in the first quarter of 1977 were substantially higher than those in the first quarter of 1976, indicating that imports are continuing their rising trend. Imports through the first quarter of 1977 reached 79 million pounds, compared with 53 million pounds imported through the first quarter of 1976. There were no imports of methanol for fuel use recorded in the first quarter of 1977.

Exports increase 22 percent over the 1975 level

Exports of methanol, both natural and synthetic, increased from 458 million pounds, valued at $16.8 million, in 1975 to 561 million pounds, valued at $23.2 million in 1976. There is no indication of fundamental changes in the composition of U.S. export markets for methanol.

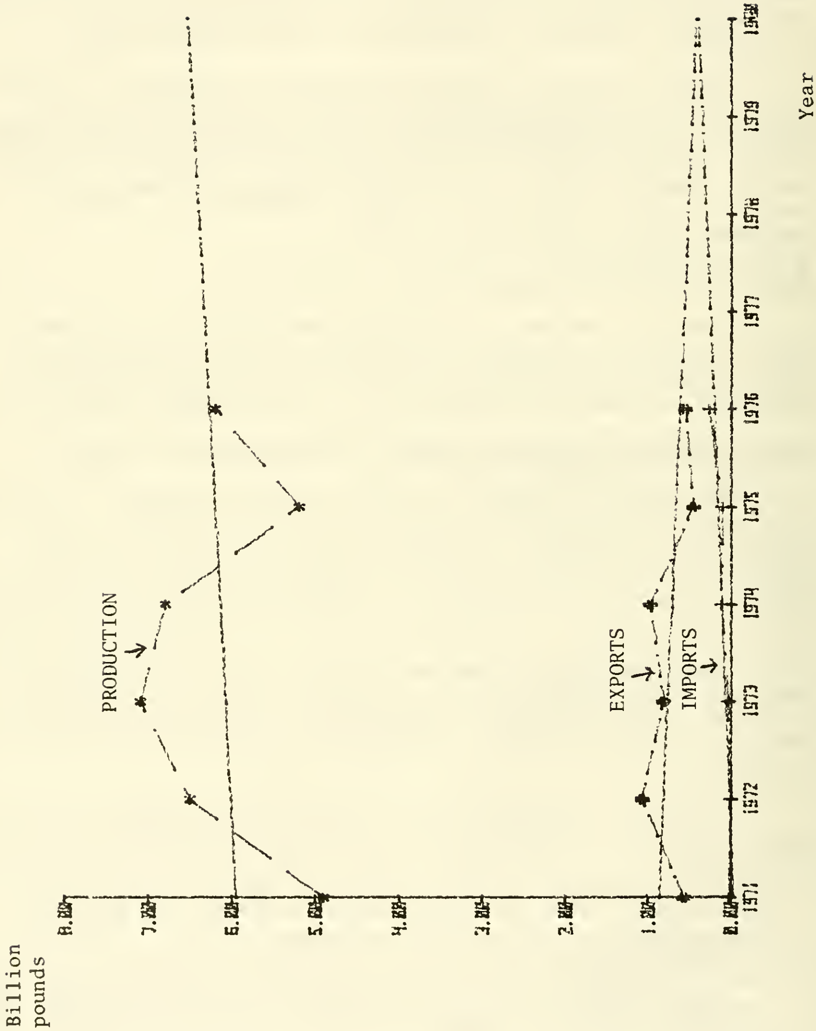
The international outlook for methanol through 1980's is unclear

There is little question that the chief determinant in the future competitiveness of world methanol producers will be raw material costs. The most economic technology, the Imperial Chemical Industries process, is readily licensable, and as such is no longer a crucial variable in establishing a nation's comparative advantage vis-a-vis other producing nations. Labor cost differences are not likely to be major determinants in the competitiveness of methanol producers, given the facts that the labor input in methanol production is low and that these differences in labor costs have equilibrated in recent years. Thus, it would seem that the future competitiveness of world methanol producers will greatly depend upon their ability to secure an adequate long-term raw material supply at a competitive price.

Given this determinant, all eyes are directed toward the announced plant construction in the Middle East, which, if it materializes could substantially alter established trading patterns not only in methanol but in many other commodity chemicals as well. There are, however, a number of indeterminate factors which may well mitigate the raw material cost advantages that these oil-rich nations currently enjoy. Their construction and distribution costs are presently much higher than those in the developed nations. In addition, these oil-rich nations may well decide to upgrade the commodity chemicals with low unit costs into intermediate and end-use products with higher unit values; the trade impact would then be felt in those sectors.

245-856 O - 77 - 19

Figure 1.--Methanol: United States Production, Exports, and Imports, 1971-76



MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS

TABLE 1.--Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1976

[Listed below are all miscellaneous end-use chemicals and chemical products for which any reported data on production and/or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists alphabetically all miscellaneous end-use chemicals and chemical products on which data on production and/or sales were reported and identifies the manufacturers of each]

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*per pound*
Grand total	15,851,080	9,159,570	2,251,127	$0.25
Chelating agents, nitriloacid and salts, total	151,043	125,114	59,223	.47
(Diethylenetrinitrilo)pentaacetic acid, pentasodium salt	...	2,821	2,146	.76
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	49,637	32,701	20,598	.63
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt	4,791	3,349	2,868	.86
All other	96,615	86,243	33,611	.40
Enzymes	(2)	(2)	33,904	...
Flotation reagents	5,568	...	...	...
Gasoline additives, total[3]	1,050,995	931,211	735,589	.79
N,N'-Di-sec-butyl-p-phenyldiamine	2,715	2,259	3,247	1.44
N,N'-Diisopropyl-p-phenylenediamine	1,178	1,067	2,139	2.00
Ethylenedibromide	201,080	148,516	41,942	.28
Tetraethyl lead	363,775	409,641	364,056	.89
All other gasoline additives	482,247	369,728	324,205	.87
Lubricating oil and grease additives, total	1,100,255	557,430	182,847	.33
Oil soluble petroleum sulfonate, calcium salt	234,316	138,805	37,657	.27
Oil soluble petroleum sulfonate, sodium salt	104,119	101,623	21,802	.21
All other lubricating oil and grease additives	761,820	317,002	123,388	.39
Paint driers, naphthenic acid salts, total[4,5]	11,336	11,151	8,322	.75
Calcium naphthenate	842	802	419	.52
Cobalt naphthenate	2,901	2,938	3,497	1.19
Lead naphthenate	4,629	4,629	2,217	.48
Manganese naphthenate	1,003	985	599	.61
Zinc naphthenate	980	885	435	.49
All other	981	912	1,155	1.27
Polymers for fibers, total	[6] 5,082,003	[6] 766,809	[6] 574,230	.75
Nylon 6 and 6/6	1,634,132	...	...	...
Polyacrylonitrile and acrylonitrile copolymers	[6] 551,961	...	...	...
Polyethylene terephthalate	1,988,132	205,852	86,179	.42
All other polymers for fiber	907,778	560,957	488,051	.87
Polymers, water soluble, total	[6] 185,312	[6] 161,018	[6] 164,766	1.02
Cellulose ethers and esters, total	[6] 115,294	[6] 99,256	[6] 101,250	1.02
Polyacrylamide	41,507	36,829	41,479	1.13
Polyacrylic acid salts, total	17,302	16,265	9,596	.59
Sodium polyacrylate	6,783	...	...	...
All other polyacrylic acid salts	10,519	16,265	9,596	.59
All other water soluble polymers	11,209	8,668	12,441	1.44
Tanning materials, synthetic	59,468	54,541	22,365	.41
Urea, total	8,161,726	6,524,000	376,363	.06
In feed compounds	490,378	421,679	26,585	.06
In liquid fertilizer	2,268,234	2,175,599	99,973	.05
In solid fertilizer	4,176,474	3,500,481	217,588	.06
In plastics	392,636	298,360	24,526	.08
All other	834,004	127,881	7,691	.06
All other miscellaneous end-use chemicals and chemical products[7]	43,374	28,296	93,518	3.30

See footnotes on following page.

Footnotes for Table 1

[1] Calculated from rounded figures.
[2] Not available.
[3] Statistics exclude production and sales of tricresyl phosphate. Statistics on tricresyl phosphate are given with the section on "Plasticizers."
[4] Quantities are given on the basis of solid naphthenate.
[5] Statistics exclude production and sales of copper naphthenate. Statistics for copper naphthenate are given in the section on "Pesticides and Related Products."
[6] Greater than 10 percent of this total is data which were estimated. It was necessary to estimate these data because one or more manufacturers of the compounds failed to supply the U.S. International Trade Commission with their data in sufficient time for its inclusion in this report. Such manufacturers are presumed to have continued production of the compound in question in 1976, therefore the volume of production and sales has been estimated by the USITC staff members.
[7] Includes all other items listed in table 2 which are not individually publishable or publishable as groups.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS' IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AN "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@CHELATING AGENTS, NITRILOACIDS AND SALTS:	
(DIETHYLENETRINITRILO)PENTAACETIC ACID	HMP.
(DIETHYLENETRINITRILO)PENTAACETIC ACID, MONOSODIUM HYDROGEN FERRIC SALT	CGY(E).
@(DIETHYLENETRINITRILO)PENTAACETIC ACID, PENTASODIUM SALT	CGY(E), DAN, DOW, HMP.
(DIETHYLENETRINITRILO)PENTAACETIC ACID, SODIUM SALT	CGY(E), RPC.
N,N-DIHYDROXYETHYLGLYCINE, SODIUM SALT	DAN, DOW, HMP.
ETHANOLDIGLYCINE, DISODIUM SALT	HMP.
(ETHYLENEDINITRILO)TETRAACETIC (ETHYLENEDIAMINETETRAACETIC ACID) (EDTA)	DOW, HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, CALCIUM DISODIUM SALT	CGY(E), DOW.
(ETHYLENEDINITRILO)TETRAACETIC ACID, DIAMMONIUM SALT	DOW, HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, DIPOTASSIUM ZINC SALT	HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, DISODIUM SALT	DOW, HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, DISODIUM COPPER SALT, DIHYDRATE	CGY(E), HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, DISODIUM ZINC SALT, DIHYDRATE	HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, MANGANESE SALT	HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, MONOAMMONIUM FERRIC SALT	HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, MONOSODIUM IRON SALT	HMP.
(ETHYLENEDINITRILO)TETRAACETIC ACID, TETRAAMMONIUM SALT	DOW.
(ETHYLENEDINITRILO)TETRAACETIC ACID, TETRAPOTASSIUM SALT	CGY(E), HMP.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@CHELATING AGENTS, NITRILOACIDS AND SALTS--CONTINUED	
@(ETHYLENEDINITRILO)TETRAACETIC ACID, TETRASODIUM SALT	CGY(E), CRT, DAN, DOW, HMP, JOR, RPC.
(ETHYLENEDINITRILO)TETRAACETIC ACID, TRISODIUM SALT	HMP.
(N-HYDROXYETHYLETHYLENEDINITRILO) TRIACETIC ACID	HMP.
(N-HYDROXYETHYLETHYLENEDINITRILO)TRIACETIC ACID, IRON SALT	HMP.
(N-HYDROXYETHYLETHYLENEDINITRILO)TRIACETIC ACID, MAGNESIUM SALT	HMP.
@(N-HYDROXYETHYLETHYLENEDINITRILO)TRIACETIC ACID, TRISODIUM SALT	CRT, DAN, DOW, HMP, RPC.
IMINODIACETIC ACID, DISODIUM SALT	HMP.
NITRILOTRIACETIC ACID	HMP, MON.
NITRILOTRIACETIC ACID, DISODIUM SALT	HMP.
NITRILOTRIACETIC ACID, TRISODIUM SALT	HMP.
@CHELATING AGENTS, NITRILOACIDS AND SALTS, ALL OTHER	CGY(E), DOW.
CHEMICAL INDICATORS	EK, FIN, GFS, NLC.
CHEMICAL REAGENTS	EK, GFS, RSA, UCC.
@ENZYMES:	
HYDROLYTIC ENZYMES:	
AMYLASES:	
AMYLASES, ALL OTHER	BAX, MLS, PFZ, RH, X.
PROTEASES:	
BROMELAIN	DOL.
FICIN	PFZ.
PAPAIN	PEN(E), PFZ.
PEPSIN	CHH, PFZ, X.
RENNIN	CHH, PFZ.
PROTEASES, ALL OTHER	BAX, MLS, PFZ, PIC, PMP, X.
HYDROLYTIC ENZYMES INCLUDING PECTIC ENZYMES AND LIPASE, ALL OTHER	BAX, JFR, MLS, PFN, PMP, RH, WBC, X.
NON-HYDROLYTIC ENZYMES:	
GLUCOSE OXIDASE	DLI.
NONHYDROLYTIC ENZYMES	MLS, OMS, PLB.
@FLOTATION REAGENTS:	
PHOSPHORODITHIOATES (DITHIOPHOSPHATES):	
DICRESYLPHOSPHORODITHIOIC ACID	ACY.
DICRESYLPHOSPHORODITHIOIC ACID, AMMONIUM SALT	ACY.
DICRESYLPHOSPHORODITHIOIC ACID, SODIUM SALT	KCU.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@FLOTATION REAGENTS--CONTINUED	
OTHER FLOTATION REAGENTS:	
2,2'-DIMETHYLTHIOCARBANILIDE (DI-ORTHO-TOLYLTHIOUREA)	RBC.
NOKES REAGENT	KCU.
ROSIN AMINES	HPC.
THIOCARBANILIDE	ACY.
@GASOLINE ADDITIVES:	
N-SEC-BUTYL-N-PHENYLPHENYLENEDIAMINE	X.
4,4'-DI-SEC-BUTYLAMINODIPHENYLMETHANE	X.
2,6-DI-TERT-BUTYL-ALPHA-DIMETHYLAMINO-PARA-CRESOL	TNA.
2,6-DI-TERT-BUTYLPHENOL	TNA.
@N,N'-DI-SEC-BUTYL-PARA-PHENYLENEDIAMINE	DUP, USR, X.
2,6-DIETHYLANILINE	TNA(E).
@N,N'-DIISOPROPYL-PARA-PHENYLENEDIAMINE	DUP, USR, X.
N,N'-DISALICYLIDENE-1,2-PROPANEDIAMINE	DUP, PER, TX, X.
@ETHYLENE DIBROMIDE	DOW, PPG, TNA.
METHYLCYCLOPENTADIENYLMANGANESE TRICARBONYL	TNA.
METHYLENE-BRIDGED POLYALKL PHENOLS	TNA.
4,4'-METHYLENEBIS(2,6-DI-TERT-BUTYLPHENOL)	TNA.
@TETRAETHYL LEAD	DUP, PPG, TNA.
TETRA(METHYL-ETHYL)LEAD, (TEL-TML,REACTED)	DUP, TNA.
TETRAMETHYLLEAD	NLC, TNA(E).
1,3,5-TRIS(3,5-DI-TERT-BUTYL-4-HYDROXYBENZYL)MESITYLENE	TNA.
@GASOLINE ADDITIVES, ALL OTHER	ASH, GLY, TNA, UPM, X.
@LUBRICATING OIL AND GREASE ADDITIVES:	
CHLOROSULFURIZED AND SULFURIZED COMPOUNDS:	
CHLOROSULFURIZED AND SULFURIZED COMPOUNDS: USED AS LUBRICATING OIL AND GREASE ADDITIVES, ALL OTHER	GLY.
OIL-SOLUBLE PETROLEUM SULFONATES:	
OIL-SOLUBLE PETROLEUM SULFONATE, AMMONIUM SALT	NTL.
OIL-SOLUBLE PETROLEUM SULFONATE, BARIUM SALT	PAR, WTC, X.
@OIL-SOLUBLE PETROLEUM SULFONATE, CALCIUM SALT	ENJ(E), ORO, PAR, PLC, TX, WTC, X.
OIL-SOLUBLE PETROLEUM SULFONATE, MAGNESIUM SALT	WTC.
@OIL-SOLUBLE PETROLEUM SULFONATE, SODIUM SALT	ENJ(E), MOR, PAR, SHC, SOC, WTC, X.
OIL-SOLUBLE PETROLEUM SULFONATE, ALL OTHER	SHC.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@LUBRICATING OIL AND GREASE ADDITIVES--CONTINUED	
PHENOL SALTS:	
NONYLPHENOL, BARIUM SALT	CCA, ENJ(E), X.
PHENOL SALTS, ALL OTHER	ORO, TX, WTC, X.
PHOSPHORODITHIOATES (DITHIOPHOSPHATES):	
DI-2-ETHYLHEXYLPHOSPHORODITHIOIC ACID	SPA.
DI-N-PROPYLPHOSPHORODITHIOIC ACID	SPA.
ZINC DIALKYLDITHIOPHOSPHATE	TX.
ZINC HYDROCARBON DITHIOPHOSPHATE	X.
PHOSPHORODITHIOATES USED AS LUBRICATING OIL AND GREASE ADDITIVES, ALL OTHER	ORO, TX.
SULFUR COMPOUNDS:	
ALIPHATIC HYDROCARBON SULFIDES	X.
ALIPHATIC IMIDES, SULFUR COMPOUNDS	ORO.
CHLOROSULFURIZED SPERM OIL	CCW.
DIISOBUTYLENE POLYSULFIDE	TX.
DI-TERTIARY NONYLPOLYSULFIDE	PAS.
SULFURIZED LARD OIL	CCW, FER, QCP, WBG.
SULFURIZED SPERM OIL SUBSTITUTES	FER, ORO.
SULFUR COMPOUNDS, ALL OTHER	CCW, TX.
@LUBRICATING OILS AND GREASE ADDITIVES, ALL OTHER	ALX, CCW, ENJ(E), FMP(E), GRH, MIL, MON, ORO, PLC, SM, TX, WTH, X, X.
@PAINT DRIERS, NAPHTHENIC ACID SALTS:	
BARIUM NAPHTHENATE	CCA.
CADMIUM NAPHTHENATE	CCA.
@CALCIUM NAPHTHENATE	CCA, HN, MCI, SW(E), TRO, WTC, X.
CHROMIUM NAPHTHENATE	MCI, WTC.
@COBALT NAPHTHENATE	CCA, HN, MCI, SHP, TRO, WTC, X.
IRON NAPHTHENATE	HN.
@LEAD NAPHTHENATE	CCA, MCI, SHP, SW(E), TRO, TX, WTC, X.
LITHIUM NAPHTHENATE	CCA, MCI.
@MANGANESE NAPHTHENATE	CCA, HN, MCI, SHP, SW(E), TRO, WTC, X.
RARE EARTHS NAPHTHENATE	CCA, SHP.
STRONTIUM NAPHTHENATE	CCA.
@ZINC NAPHTHENATE	CCA, HN, MCI, SW(E), TRO, WTC, X.
@PAINT DRYERS, NAPHTHENIC ACID SALTS, ALL OTHER	CCA, EK, MCI, SHP.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
PHOTOGRAPHIC CHEMICALS:	
N-2-(4-AMINO-N-ETHYL-META-TOLUIDINO)ETHYL METHANE-SULFONAMIDE	X.
2-(4-AMINO-N-ETHYL-META-TOLUIDINO) ETHYL SULFATE	X.
3-AMINO-1,2,4-TRIAZOLE	PMT.
BENZOTRIAZOLE	PMT.
CATECHOL	CRZ.
3-CHLORO-4-DIETHYLAMINOBENZENEDIAZONIUM CHLORIDE (PARA-DIAZO-2-CHLORO-N,N-DIETHYLANILINE)-ZINC CHLORIDE	ESA, PMT.
4-DIAZO-3,5-DIETHOXYTHIOCRESOL SALTS	PMT.
2,5-DIETHOXY-4-MORPHOLINOBENZENEDIAZONIUM CHLORIDE	ALL, ESA.
P-DIETHYLAMINOBENZENEDIAZONIUM CHLORIDE (P-DIAZO-N,N-DIETHYLANILINE)-ZINC CHLORIDE	ESA, PMT, WAY.
N,N-DIETHYL-P-PHENYLENEDIAMINE HYDROCHLORIDE	EKT.
N,N-DIETHYLTOLUENE-2,5-DIAMINE, MONOHYDROCHLORIDE	EKT, WAY.
P-DIMETHYLAMINOBENZENEDIAZONIUM CHLORIDE (P-DIAZO-N,N-DIMETHYLANILINE)-ZINC CHLORIDE	ESA, PMT.
PARA-DIPHENYLAMINEDIAZONIUM SULFATE	PMT.
PARA-(N-ETHYLBENZIMIDO)BENZENEDIAZONIUM CHLORIDE (PARA-DIAZO-N-BENZYL-N-ETHYLANILINE)-ZINC CHLORIDE	PMT.
PARA-*ETHYL(2-HYDROXYETHYL)AMINO*BENZENEDIZONIUM CHLORIDE (PARA-DIAZO-N-ETHYL-N-HYDROXYETHYLANILINE)-ZINC CHLORIDE	ESA, PMT, WAY.
N-ETHYL-N-HYDROXYETHYL-PARA-PHENYLENEDIAMINE SULFATE	WAY.
HYDROQUINONE	EKT.
PARA-*(2-HYDROXYETHYL)METHYLAMINO*BENZENEDIAZONIUM CHLORIDE (PARA-DIAZO-N-HYDROXYETHYL-N-METHYLANILINE)-ZINC CHLORIDE	ESA, PMT.
4-METHOXY-1-NAPHTHOL	X.
PARA-METHYLAMINOPHENOL SULFATE	EK.
5-METHYLBENZOTRIAZOLE	EK.
6-NITROBENZIMIDAZOLE	EK, PMT.
PHENYL-5-MERCAPTOTETRAZOLE	PMT.
1-PHENYL-3-PYRAZOLIDONE	CGY(E).
1-(2,4,6-TRICHLOROPHENYL)-3-PARA-NITROANILINO-2-PYRAZOLIN-5-ONE	X.
PHOTOGRAPHIC CHEMICALS, ALL OTHER	EK, ESA, FIN, PMT, HST, MIL, WAY, X, X.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@POLYMERS FOR FIBERS:	
CELLULOSE ACETATE	CEL, DUP, EKT.
NYLON 6 (POLYMER FOR FIBER, ONLY)	ALF, FRF.
NYLON 6/6	DUP, FND, MON.
@POLYACRYLONITRILE AND ACRYLONITRILE COPOLYMERS	DUP, MON.
@POLYETHYLENE TEREPHTHALATE	DUP, EK, EKT, FND, GYR.
@POLYMERS FOR FIBERS, ALL OTHER	BKL, DUP, EK, EKT, FRF, MON, SKP.
@POLYMERS, WATER SOLUBLE:	
@CELLULOSE ETHERS AND ESTERS:	
HYDROXYETHYLCELLULOSE	UCC.
METHYLCELLULOSE	DOW.
SODIUM CARBOXYMETHYLCELLULOSE (100%)	BUK, WMP.
CELLULOSE ETHERS AND ESTERS, ALL OTHER	DOW.
DEXTRAN	PHR.
@POLYACRYLAMIDE	ACY, CEL(E), DOW, HPC, MRK, NLC.
@POLYACRYLIC ACID SALTS:	
AMMONIUM POLYACRYLATE	BFG.
@SODIUM POLYACRYLATE	ALC, BFG, DA, NLC, RH, STC.
@POLYACRYLIC ACID SALTS, ALL OTHER	ACY, BFG, NLC.
POLYETHYLENEIMINE	DOW.
POLYMETHACRYLIC ACID, SODIUM SALT	GRD, NLC.
1-VINYL-2-PYRROLIDINONE, POLYMERS	DAN, GAF.
@POLYMERS, WATER SOLUBLE, ALL OTHER	GAF.
RARE SUGARS:	
RARE SUGARS	PFN.
SILICONE GREASES	DCC, SPD, SWS.
@TANNING MATERIALS, SYNTHETIC:	
HYDROXYTOLUENESULFONIC ACID, FORMALDEHYDE CONDENSATE (CRESOL-FORMALDEHYDE SULFONATE), SODIUM SALT	DA.
1-NAPHTHALENESULFONIC ACID,FORMALDEHYDE CONDENSATE AND SALT	DA.
2-NAPHTHALENESULFONIC ACID, FORMALDEHYDE CONDENSATE AND SALT	AKS, GRD, RH.
1-PHENOL-2-SULFONIC ACID,FORMALDEHYDE CONDENSATE (PHENOL-FORMALDEHYDE,SULFONATED)	RH.
TANNING MATERIALS, SYNTHETIC, ALL OTHER	CGY(E), DA, MIL, UCC.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TEXTILE CHEMICALS, OTHER THAN SURFACE-ACTIVE AGENTS:	
DIMETHYLOLDIHYDROXYETHYENE UREA	CHP, DAN.
2,2',4,4'-TETRAHYDROXYBENZOPHENONE	GAF.
TRI(BEHENOYLOXYMETHYL)TRIMETHOXYMETHYLMELAMINE	DUP.
TEXTILE CHEMICALS, OTHER THAN SURFACE ACTIVE AGENTS, ALL OTHER	DAN, GAF, HDG.
UREA, BY END-USE MARKETS:	
UREA, PRIMARY SOLUTION (REPORT ON 100% UREA-CONTENT BASIS)	ACN, ACS, ACY(E), AGY, AKL, APD, ARM, BIC, BOR, CFA, CHN, CNC, COL, DUP, FCA, FTX, GPI, HKY, HN, HPC, JDC, MSC, OMC, PLC, PPC, SAG, SMP, SNI, SOH, TER, VLN, WLC, WYC.
UREA IN COMPOUNDS OR MIXTURES (100% BASIS):	
@UREA IN FEED COMPOUNDS	ACN, AGY, APD, BIC, FMS, FTX, JDC, MSC, PPC, SNI, SOH, TER, VLN, WYC.
@UREA IN LIQUID FERTILIZER	ACN, AGY, AKL, APD, ARM, CFA, CHN, CNC, FCA, FMS, FTX, GPI, HKY, HN, HPC, JDC, MSC, PLC, PPC, SAG, SMP, SNI, SOH, TER, VLN, WLC, WYC.
UREA LIQUOR	TER.
@UREA IN PLASTICS	ACS, FMS, MSC, OMC, SOH.
@UREA IN SOLID FERTILIZER	ACN, ACS, AGY, APD, BIC, CFA, COL, FMS, FTX, HN, HPC, JDC, MSC, OMC, PPC, SOH, TER, VLN, WLC, WYC.
@UREA IN COMPOUNDS AND MIXTURES (100% BASIS), ALL OTHER	ACS, ACY(E), BOR, DUP, JDC, PFN, SOH, WYC.

TABLE 3.--MISCELLANEOUS END-USE CHEMICAL AND CHEMICAL PRODUCTS: DIRECTORY OF MANUFACTURERS, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of miscellaneous end-use chemicals and chemical products to the U.S. International Trade Commission for 1976 are listed below in the order of their identification code as used in table 2]

Code	Name of company
	Allied Chemical Corp.:
ACN	Agricultural Div.
ACS	Specialty Chemicals Div.
ACY	American Cyanamid Co.
AGY	Agway, Inc., Olean Nitrogen Complex
AIP	Air Products & Chemicals, Inc.
AKL	Gardinier Big River, Inc.
ALF	Allied Chemical Corp., Fibers Div.
ALL	Alliance Chemical, Inc.
ALX	Alox Corp.
AMB	American Bio-Synthetic Corp.
APD	Atlas Powder Co. Subsidiary of Tyler Corp.
ASH	Ashland Oil, Inc., Ashland Chemical Co.
BAS	BASF Wyandotte Corp.
BAX	Baxter Laboratories, Inc.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Co. Div.
BIC	Beker Industries, Inc.
BOR	Borden Co., Borden Chemical Div.
BUK	Buckeye Cellulose Corp.
CCA	Interstab Chemical, Inc.
CCW	Cincinnati Milacron Chemicals, Inc.
CEL	Celanese Corp.:
	Celanese Fibers Co.
CFA	Cooperative Farm Chemicals Association
CGY	Ciba-Geigy Corp. and Pharmaceutical Div.
CHH	CHR. Hansen's Laboratory, Inc.
CHN	N-Ren Corp., Cherokee Nitrogen Div.
CNC	Columbia Nitrogen Corp.
CRN	CPC International, Inc., Amerchol
CRT	Crest Chemical Corp.
DA	Diamond Shamrock Corp.
DAN	Dan River, Inc.
DCC	Dow Corning Corp.
DLI	Dawe's Laboratories, Inc.
DOL	Castle & Cooke, Inc., Castle & Cooke Foods, Hawaii Region
DOW	Dow Chemical Co.
DUP	E. I. DuPont de Nemours & Co., Inc.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
ENJ	Exxon Chemical Co. U.S.A.
ESA	East Shore Chemical Co., Inc.
FER	Ferro Corp.:
	Ferro Chemical Div.
	Keil Chemical Div.
FIN	Hexcel Corp., Fine Organics Div.
	FMC Corp.:
FMP	Industrial Chemical Div.
FMS	First Mississippi Corp.
FMT	Fairmount Chemical Co., Inc.
FND	Fiber Industries, Inc.
FRF	Firestone Tire & Rubber Co., Firestone Synthetic Fibers Co.
GAF	GAF Corp., Chemical Div.
GCC	W. R. Grace & Co., Agricultural Chem. Group
GFS	G. Frederick Smith Chemical Co.
GLY	Glyco Chemicals, Inc.
GPI	Goodpasture, Inc.
GRD	W. R. Grace & Co., Polymers & Chemicals Div.
GYR	Goodyear Tire & Rubber Co.
HDG.	Hodag Chemical Corp.
HK	Hooker Chemicals & Plastic Corp.:
HKD	Durez Div.
HKY	Hawkeye Chemical Co.
HMP	W. R. Grace & Co., Organic Chemicals Div.
HN	Tenneco Chemicals, Inc.
HPC	Hercules, Inc.
JDC	Nipak, Inc.
JFR	George A. Jeffrey's & Co., Inc.
JOR	Jordan Chemical Co.
KCU	Kennecott Copper Corp., Utah Copper Div.
MCI	Mooney Chemicals, Inc.
MIL	Milliken & Co., Milliken Chemical Div.
MLS	Miles Laboratories, Inc., Marschall Div.
MON	Monsanto Co.
MOR	Marathon Morco, Co.
MRK	Merck & Co., Inc.
MSC	Mississippi Chemical Corp.
NEP	Nepera Chemical Co.
NLC	Nalco Chemical Co.
NTL	NL Industries, Inc.
OMC	Olin Corp.
OMS	E. R. Squibb & Sons, Inc.
ORO	Chevron Chemical Co.
OXC	Oxochem Enterprises
PAR	Pennzoil Co., Penneco Div.
PAS	Pennwalt Corp.
PD	Parke, Davis & Co. Sub of Warner-Lambert Co.
PEN	CPC International, Inc., S. B. Penick Div.
PFN	Pfanstiehl Laboratories, Inc.
PFZ	Pfizer, Inc. & Pfizer Pharmaceuticals, Inc.
PHR	Pharmachem Corp.
PIC	Pierce Chemical, Inc.
PLB	P-L Biochemicals, Inc.
PLC	Phillips Petroleum Co.
PMP	Premier Malt Products, Inc.
PPC	Premier Petrochemical Co.
PPG	Pittsburgh Plate Glass Co.
RBC	Fike Chemicals, Inc.
RH	Rohm & Haas Co.
RPC	Millmaster Onyx Corp., Refined-Onyx Div.

TABLE 3.--MISCELLANEOUS END-USE CHEMICAL AND CHEMICAL PRODUCTS: DIRECTORY OF MANUFACTURERS, 1976--CONTINUED

Code	Name of company	Code	Name of company
RSA	R.S.A. Corp.	TRI	Triad Chemicals
		TRO	Troy Chemical Corp.
SAG	Swift Agricultural Chemicals	TVA	Tennessee Valley Authority
SHC	Shell Oil Co., Shell Chemical Co. Div.	TX	Texaco, Inc.
SM	Mobil Oil Corp., Chemical Co.: Chemical Coatings Div.		
		UPM	UOP, Inc.
SMP	J.R. Simplot Co., Minerals & Chemical Div.	USR	Uniroyal, Inc., Chemical Div.
SNI	Kaiser Aluminum & Chemical Corp., Kaiser Agricultural Chemicals Div.	VLN	Valley Nitrogen Producers, Inc.
		VND	Van Dyk & Co., Inc.
SOC	Standard Oil Co. of California, Chevron Chemical Co.		
		WAG	West Agro Chemical, Inc.
SOH	Vistron Corp.	WAY	Phillip A. Hunt Chemical Corp., Organic Chemical Div.
SPD	General Electric Co., Silicone Products Dept.		
		WBC	Worthington Biochemical Corp.
SW	Sherwin-Williams Co.	WBG	White & Bagley Co.
SWS	Stauffer Chemical Co., SWS Silicones Div.	WLC	Agrico Chemical Co.
		WMP	Essex Group, Inc.
		WTC	Witco Chemical Co., Inc.
TCC	Tanatex Chemical Corp.	WTH	Union Camp Corp., Chemical Div., Dover Plant
TER	Terra Chemicals International, Inc.	WYC	Wycon Chemical Co.
TNA	Ethyl Corp.		
		ZGL	Carolina Processing Corp.

Note.--Complete names and addresses of the above reporting companies are listed in Table 1 of the Appendix.

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

K. James O'Connor, Jr. and Thomas O'Connell

This section is extensively revised from that of previous years. Many of these changes reflect suggestions proposed by an industry task force. For this reason, the data contained within this section are not generally comparable with the data from previous years. Several large volume items such as urea and polymers for fiber were moved to the section entitled Miscellaneous End-Use Chemicals and Chemical Products.

The term miscellaneous chemicals as it is used here comprises those synthetic organic products that are not included in the use groups covered by the other sections of this report. They include products that are employed in a great variety of uses. The number of chemicals used extensively for only one purpose is not large. Among the products covered are those used for refrigerants, aerosols, solvents, and a wide range of chemical intermediates.

U.S. production of miscellaneous cyclic and acyclic chemicals in 1976 amounted to 83.5 billion pounds. U.S. sales for 1976 totaled 33.9 billion pounds valued at $7.1 billion. Production of miscellaneous cyclic chemicals comprised only 5 percent of this section's total production.

The most important group among the miscellaneous acyclic chemicals was the halogenated hydrocarbons. U.S. production for this group in 1976 reached 20.8 billion pounds or 25 percent of this section's total production. U.S. sales for this group amounted to 8.8 billion pounds valued at $1.4 billion. Other important groups were the monohydric unsubstituted alcohols with production of 14.3 billion pounds, the aldehydes with a total production of 8.3 billion pounds, and the nitrogenous compounds with production of 7.6 billion pounds.

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1976

[Listed below are all miscellaneous chemicals for which any reported data on production or sales may be published. (Leaders (...) are used where the reported data are accepted in confidence and may not be published or where no data were reported.) Table 2 lists all miscellaneous chemicals for which data on production and/or sales were reported and identifies the manufacturers of each]

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	83,553,062	33,911,741	7,136,673	$0.20
MISCELLANEOUS CHEMICALS, CYCLIC				
Total	3,881,178	1,303,010	682,150	.38
Benzoic acid, sodium salt	14,197	12,727	6,444	.51
Benzoyl peroxide	3,841	8,536	15,005	1.76
Benzyl alcohol	8,636	7,394	4,884	.66
tert-Butyl peroxybenzoate	1,690	1,579	2,752	1.74
Caprolactam	779,659	...	...	...
2,6-Di-tert-butyl-p-cresol (BHT):				
Food grade	8,862	8,046	6,711	.83
Tech. grade	10,947	10,909	9,700	.89
Dioxane (1,4-Diethylene oxide)	14,873	5,654	4,070	.72
Hexamethylenetetramine, tech. grade	47,102	...	...	...
p-Hydroxybenzoic acid, methyl ester	797	713	1,726	2.42
p-Hydroxybenzoic acid, propyl ester	192	231	620	2.68
2-Hydroxy-4-methoxybenzophenone	530	487	1,522	3.13
Maleic anhydride	263,968	201,775	64,454	.32
α-Pinene	...	5,300	724	.14
β-Pinene	25,366	2,757	828	.30
Tall oil salts, total[2]	1,992	1,909	1,561	.82
Calcium tallate	123	124	68	.55
Lead tallate	317	293	142	.48
Tall oil salts, all other	1,552	1,492	1,351	.91
All other miscellaneous cyclic chemicals	2,693,526	1,534,993	561,149	.37
MISCELLANEOUS CHEMICALS, ACYCLIC				
Total	79,671,884	32,108,731	6,454,523	.20
Nitrogenous Compounds				
Total[3]	7,555,682	1,922,663	744,053	.39
Amides	294,762	102,854	62,361	.61
Amines, total	1,777,299	415,658	227,511	.55
Butylamines	49,585	43,202	21,192	.49
Ethylamines:				
Diethylamine	13,897	8,320	4,865	.58
Ethylamine, mono-	36,806	...	...	...
1,6-Hexanediamine (Hexamethylenediamine)	855,965	...	...	...
Isopropylamine, mono-	33,353	37,417	13,388	.36
Methylamines: Dimethylamine	...	43,229	13,233	.31
All other	787,693	283,490	174,833	.62
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	...	10,789	7,862	.73
Ethanolamines, total	286,224	260,175	87,652	.34
2-Aminoethanol (Monoethanolamine)	92,992	82,814	27,364	.33
2,2'-Aminodiethanol (Diethanolamine)	88,568	81,487	27,433	.34
2,2',2''-Nitrilotriethanol (Triethanolamine)	104,664	95,874	32,855	.34

See footnotes at end of table.

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1976--CONINTUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
MISCELLANEOUS CHEMICALS, ACYCLIC--Continued				
Nitrogenous Compounds--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Hexamethylenediammonium adipate	732,409	...	...	...
Nitriles, total	3,171,053	690,761	166,755	$0.24
Acrylonitrile	1,517,830	600,987	147,144	.24
Nitriles, all other	1,653,223	89,774	19,611	.22
All other nitrogenous compounds	1,293,935	442,426	191,912	.43
Acids, Acyl Halides, and Anhydrides				
Total	6,725,256	1,360,648	394,388	.29
Acetic acid, synthetic, 100%	2,463,342	544,419	70,429	.13
Acetic anhydride, 100%	1,506,050	178,021	36,145	.20
Acrylic acid	256,331	35,881	11,313	.32
Adipic acid	1,280,907	101,703	52,166	.51
Fumaric acid	33,765	30,583	12,748	.42
Lauroyl chloride	2,041	...	...	...
Polyacrylic acid	2,452	1,656	1,405	.85
Propionic acid	76,102	39,266	7,111	.18
All other acids, acyl halides, and anhydrides	1,104,266	429,119	203,071	.47
Salts of Organic Acids				
Total	369,437	254,270	137,190	.54
Acetic acid salts, total	23,998	20,661	10,592	.51
Barium acetate	...	28	42	1.48
Zinc acetate	116	208	301	1.45
Zirconium acetate	91	...	...	...
All other	23,791	20,425	10,249	.50
2-Ethylhexanoic acid (α-Ethylcaproic acid) salts, total	16,420	14,873	15,377	1.03
Calcium 2-ethylhexanoate	2,524	1,863	1,096	.59
Cobalt 2-ethylhexanoate	4,413	3,893	5,333	1.37
Lead 2-ethylhexanoate	2,595	2,499	1,275	.51
Manganese 2-ethylhexanoate	990	959	569	.59
Zinc 2-ethylhexanoate	1,491	1,466	1,008	.69
Zirconium 2-ethylhexanoate	2,606	2,417	2,811	1.16
All other	1,801	1,776	3,285	1.85
Maleic acid salts	465	1,473	1,474	1.00
Oleic acid salts	496	501	668	1.33
Stearic acid salts, total[4]	80,723	81,016	47,642	.59
Aluminum distearate	2,419	2,426	1,691	.70
Aluminum tristearate	...	290	201	.69
Barium stearate	1,001	1,005	675	.67
Calcium stearate	45,545	45,873	23,420	.51
Cobalt stearate	362	351	475	1.35
Lead stearate	1,254	1,133	712	.63
Magnesium stearate	5,530	5,292	3,761	.71
Zinc stearate	22,254	22,484	15,117	.67
All other	2,358	2,162	1,590	.74
Tartaric acid salts	388	...	...	...
All other salts of organic acids	246,947	135,746	61,437	.45

See footnotes at end of table.

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
MISCELLANEOUS CHEMICALS, ACYCLIC--Continued				
Aldehydes	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Total	8,278,682	1,906,575	160,480	$0.08
Butyraldehyde	749,116	...	...	...
Formaldehyde (37% by weight)	5,449,322	1,471,772	76,095	.05
Isobutyraldehyde	372,071	2,127	325	.15
All other	1,708,173	432,676	84,060	.19
Ketones				
Total	2,907,416	2,176,338	343,399	.16
Acetone, total	1,868,979	1,391,485	181,450	.13
From cumene	1,189,516	851,479	106,546	.12
From isopropyl alcohol	679,463	540,006	74,904	.14
2-Butanone (Methyl ethyl ketone)	428,146	414,638	78,452	.19
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	...	44,990	10,761	.24
4-Methyl-2-pentanone (Methyl isobutyl ketone)	197,537	150,929	36,043	.24
All other	412,754	174,296	36,693	.21
Alcohols, Monohydric, Unsubstituted				
Total	14,252,696	6,864,146	876,096	.13
Alcohols, C_{11} or lower, unmixed, total	13,305,619	6,335,798	707,727	.11
Butyl alcohols:				
n-Butyl alcohol (n-Propylcarbinol)	625,277	344,366	64,729	.19
Isobutyl alcohol (Isopropylcarbinol)	174,789	139,403	20,458	.15
Ethyl alcohol, synthetic[5]	1,496,311	889,992	152,631	.17
2-Ethyl-1-hexanol	450,206	338,411	70,391	.21
Isopropyl alcohol	1,935,846	[6] 961,327	[6] 131,669	.14
Methanol, synthetic	6,242,241	2,132,994	125,587	.06
Propyl alcohol (Propanol)	134,247	97,932	21,772	.22
All other	2,246,702	1,431,373	120,490	.08
Alcohols, C_{12} and higher, unmixed, total	299,724	145,869	41,296	.28
Mixtures of alcohols, total	647,353	382,479	127,073	.33
Esters of Monohydric Alcohols				
Total	3,659,498	1,956,978	546,997	.28
n-Butyl acetate, unmixed	112,508	98,409	22,375	.23
Butyl acrylate	205,284	114,673	38,262	.33
Dibutyl maleate	7,903	6,900	2,627	.38
Di(2-ethyl-1-hexyl) maleate	863	377	154	.41
Dilauryl-3,3'-thiodipropionate	2,207	1,950	2,198	1.13
Ethyl acetate (85%)	215,552	193,664	36,380	.19
Ethyl acrylate	295,129	135,464	37,927	.28
2-Ethyl-1-hexyl acrylate	44,027	42,165	16,190	.38
Phosphorus acid esters, not elsewhere specified	59,200	52,853	42,155	.80
Propyl acetate	42,811	40,886	9,923	.24
Vinyl acetate	1,480,647	711,518	129,054	.18
All other	1,193,367	558,119	209,752	.38
Polyhydric Alcohols[7]				
Total	4,630,310	3,528,318	843,992	.24
Ethylene glycol	3,334,587	2,525,135	495,332	.20
Glycerol, synthetic only	157,733	147,632	68,955	.47

Footnotes at end of table.

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES QUANTITY	SALES VALUE	SALES UNIT VALUE[1]
MISCELLANEOUS CHEMICALS, ACYCLIC--Continued				
Polyhydric Alcohols--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Pentaerythritol	105,167	[6] 104,256	[6] 43,698	$0.42
Propylene glycol	516,932	469,850	122,390	.26
Sorbitol (70% by weight)	195,474	135,405	48,630	.36
All other	320,417	146,040	64,987	.44
Polyhydric Alcohol Esters				
Total	104,124	97,668	42,785	.44
Ethylene glycol diacrylate	849	...	...	...
Trimethylolpropane triacrylate	499	...	...	...
All other	102,776	97,688	42,785	.44
Polyhydric Alcohol Ethers				
Total	1,409,730	1,139,677	323,023	.28
2-Butoxyethanol	100,128	138,531	37,987	.27
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	31,318	24,982	7,445	.30
Diethylene glycol	276,076	186,600	32,488	.17
Dipropylene glycol	49,615	42,705	11,283	.26
2-Ethoxyethanol	198,169	108,636	27,417	.25
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ethers)	34,790	26,455	7,209	.27
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	16,031	...	...	...
2-Methoxyethanol (Ethylene glycol monomethyl ether)	87,611	90,577	22,933	.25
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	10,110	9,149	2,561	.28
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	20,538	...	...	...
Polyethylene glycol	91,741	91,267	33,773	.57
Polypropylene glycol	38,335	26,220	9,446	.36
Tetraethylene glycol	13,663	12,457	5,022	.40
All other	441,605	382,098	125,459	.33
Halogenated Hydrocarbons				
Total	20,790,916	8,786,869	1,401,708	.16
Carbon tetrachloride	856,804	459,024	60,344	.13
Chlorinated paraffins, total	75,949	68,536	20,040	.29
35%-64% chlorine	60,210	55,428	14,942	.27
Other	15,739	13,108	5,098	.39
Chloroethane (Ethyl chloride)	669,216	316,612	36,847	.12
Chloroform	291,855	265,400	42,240	.16
Chloromethane (Methyl chloride)	377,672	184,443	25,930	.14
1,2-Dichloroethane (Ethylene dichloride)	8,041,846	1,360,980	109,993	.08
Dichloromethane (Methylene chloride)	537,729	500,295	86,004	.17
1,2-Dichloropropane (Propylene dichloride)	71,040	42,995	2,470	.06
Fluorinated hydrocarbons, total	1,000,356	...	...	...
Chlorodifluoromethane (F-22)	169,753	125,842	88,775	.71
Dichlorodifluoromethane (F-12)	393,001	371,036	151,386	.41
Trichlorofluoromethane (F-11)	256,111	239,372	81,635	.34
All other fluorinated hydrocarbons	181,491	...	...	...

See footnotes at end of table.

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1976--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE[1]
MISCELLANEOUS CHEMICALS, ACYCLIC--Continued				
Halogenated Hydrocarbons--Continued	*1,000 pounds*	*1,000 pounds*	*1,000 dollars*	*Per pound*
Tetrachloroethylene (Perchloroethylene)	668,930	572,470	83,347	$0.15
1,1,1-Trichloroethane (Methyl chloroform)	631,255	614,863	113,769	.19
Trichloroethylene	315,496	298,476	46,042	.15
Vinyl chloride, monomer (Chloroethylene)	5,676,895	3,113,464	314,842	.10
All other halogenated hydrocarbons	1,575,873	248,061	138,044	.56
All Other Miscellaneous Acyclic Chemicals				
Total	8,988,137	2,114,581	640,412	.30
2-Butanone peroxide	6,350	6,157	6,515	1.06
tert-Butyl peroxide (Di-tert-butyl peroxide)	2,669	2,526	2,394	.95
Carbon disulfide	507,926	394,205	26,529	.07
Epoxides, ethers, and acetals, total	6,600,816	1,425,049	321,768	.23
Ethylene oxide	4,184,258	439,443	111,663	.25
Propylene oxide	1,823,222	...	...	...
All other epoxides, ethers, and acetals	593,336	985,606	210,105	.21
Organo-silicon compounds, total	188,272	107,722	160,930	1.49
Phosgene (Carbonyl chloride)	814,302	...	...	...
Sodium methoxide (Sodium methylate)	13,997	14,745	5,753	.39
All other	853,805	164,177	116,523	.71

[1] Calculated from rounded figures.
[2] Quantities are given on the basis of solid naphthenate, tallate, or linoleate content.
[3] Statistics exclude production and sales of fatty amines. Statistics on fatty amines are given with "Surface-Active Agents."
[4] Statistics exclude production and sales of potassium and sodium stearates. Statistics on these stearates are included with "Surface-Active Agents."
[5] Statistics on production of ethyl alcohol from natural sources by fermentation are issued by the Department of the Treasury, Bureau of Alcohol, Tobacco, and Firearms.
[6] Greater than 10 percent of this total is data which were estimated. It was necessary to estimate these data because one or more manufacturers of the compounds failed to supply the U.S. International Trade Commission with their data in sufficient time for its inclusion in this report. Such manufacturers are presumed to have continued production of the compound in question in 1977, therefore the volume of production and sales has been estimated by the USITC staff members.
[7] Some polyols which are used as intermediates for urethanes have been included with "Plastics and Resin Materials."

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH A "@"; CHEMICALS NOT SO MARKED DO NOT APPEAR IN TABLE 1 BECAUSE THE REPORTED DATA ARE ACCEPTED IN CONFIDENCE AND MAY NOT BE PUBLISHED. MANUFACTURERS' IDENTIFICATION CODES SHOWN BELOW ARE TAKEN FROM TABLE 3. AN "X" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT. COMPANY IDENTIFICATION CODES WHICH ARE FOLLOWED BY AN "(E)" ARE SO LABELED BECAUSE THE COMPANY FAILED TO SUPPLY THE U. S. INTERNATIONAL TRADE COMMISSION WITH THEIR DATA IN SUFFICIENT TIME FOR ITS INCLUSION IN THIS REPORT. THE COMPANY IS PRESUMED TO HAVE CONTINUED PRODUCTION OF THE COMPOUND IN QUESTION IN 1976 AND THE VOLUME OF PRODUCTION AND SALES HAS BEEN ESTIMATED BY THE USITC STAFF MEMBERS)

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, CYCLIC:	
6-ACETOXY-2,4-DIMETHYL-1,3-DIOXANE	GIV.
AMYL PARA-DIMETHYLAMINOBENZOATE	VND.
BENZOIC ACID SALTS:	
@SODIUM BENZOATE	HN, MON, PFZ.
BENZOIC ACID SALTS, ALL OTHER	EK, VEL.
PARA-BENZOQUINONE	EKT.
BENZOTHIAZOLE	ACY, RCI.
BENZOTRIAZOLE, SUBSTITUTED	CGY(E).
@BENZOYL PEROXIDE	AZT, CAD, NOC, WTC, WTL.
@BENZYL ALCOHOL	MNR, SFS, UOP, VEL.
BIS(2,4-DICHLOROBENZOYL) PEROXIDE	CAD, WTL.
BORON FLUORIDE - PHENOL COMPLEX	ACS.
N-BROMOSUCCINIMIDE	ARA.
BUTYL BENZOATE	CPS, PFZ, TCC, VEL.
2(AND 3)-TERT-BUTYL-4-METHOXYPHENOL (BHA)	EKT.
@TERT-BUTYL PEROXYBENZOATE	AZT, CAD, NOC, WTC.
4-TERT-BUTYLPYROCATECHOL	BKL, DOW.
CAMPHENE	GLD, HPC, NCI.
@CAPROLACTAM	ALP, CNP, DBC.
CELLULOSE ACETATE PHTHALATE	UCC, X.
CENTRALITE-1	OTC(E).
1-(3-CHLOROALLY)-3,5,7-TRIAZA-1-AZONIA ADAMANTANE CHLORIDE	DOW.
CUMENE HYDROPEROXIDE	ACS, CLK, RCI.
CYANURIC ACID	FMB.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, CYCLIC--CONTINUED	
CYCLOHEXANONE PEROXIDE	NOC.
CYCLOHEXENE-1,2-DICARBOXYLIC ACID (TETBAHYDROPHTHALIC ACID), DISUBSTITUTED, POLYESTER SALTS:	
CYCLOHEXENE-1,2-DICARBOXYLIC ACID (TETRAHYDROPHTHALIC ACID, DISUBSTITUTED, POLYESTER SALTS, ALL OTHER	OTC(E).
1,4-CYCLOHEXYLENEDIMETHANOL	EKT.
CYCLOPROPANE	OH.
DECABROMOBIPHENYL OR ETHER	DOW, FIN.
DECAHYDRONAPHTHALENE	DUP.
DEHYDROACETIC ACID OR SODIUM SALT	EKT, GAN.
DIAZODINITROPHENOL	HPC.
2,5-DI(BENZOYL PEROXY)-2,5-DIMETHYLHEXANE	WTL.
@2,6-DI-TERT-BUTYL-PARA-CRESOL, (BHT), FOOD GRADE	ASH, KPT, SHC, USR.
@2,6-DI-TERT-BUTYL-PARA-CRESOL, (BHT), TECHNICAL GRADE	ASH, KPT, SHC, USR.
2,5-DI-TERT-BUTYLHYDROQUINONE	EKT.
1,3-DICHLORO-5,5-DIMETHYLHYDANTOIN	GLY.
DICHLORO-S-TRIAZINE-2,4,6(1H,3H,5H)TRIONE (DICHLORO ISOCYANURIC ACIDS AND SALTS)	FMB.
4,4'-DICHLORO-3-(TRIFLUOROMETHYL)CABANILIDE	CGY(E).
DICYCLOHEXYLAMMONIUM NITRITE	OMC.
2-,5-DIHYDROTHIOPHENE-1,1-DIOXIDE (SULFOLENE)	WTC.
2,2'-DIHYDROXY-4,4'-DIMETHOXYBENZOPHENONE	GAF.
2,2'-DIHYDROXY-4-METHOXYBENZOPHENONE	ACY.
DIIODOMETHYL-PARA-TOLYL SULPHONE	ABB.
DIKETENES	PMP(E).
PARA-DIMETHOXYBENZENE (DIMETHYL ETHER OF HYDROQUINONE)	ASL, EKT.
4,4-DINITROCARBANILIDE-4,6-DIMETHYL-2-PYRIMIDOL	MRK.
@DIOXANE	CPS, DOW, FER, UCC.
1,3-DIOXOLANE	FER.
4-(DODECYLOXY)-2-HYDROXYBENZOPHENONE	DUP, EKT.
1,2-EPOXY-3-PHENOXYPROPANE	X.
ETHYL CELLULOSE PHTHALATE	EK.
ETHYLENE IMINE, MONOMER	DOW.
2-ETHYLHEXYL BENZOATE	TCC.
2-ETHYLHEXYL-PARA-DIMETHYLAMINOBENZOATE	EVN, VND.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, CYCLIC--CONTINUED	
ETHYLIDINE NORBORNENE	UCC.
4-ETHYLMORPHOLINE	UCC.
FURAN DERIVATIVES:	
2-FURALDEHYDE	QKO.
TETRAHYDROFURFURYL ALCOHOL	QKO.
GALLIC ACID, TECH.	HSH, MAL.
GLYCERYL PARA-AMINOBENZOATE	VND.
@HEXAMETHYLENETETRAMINE, TECH.	BOR, HKD, HN, PLS.
HOMOMENTHYL SALICYLATE	NEO.
HYDRINDANTIN	HEX(E).
HYDROXYBENZOIC ACID, BENZYL ESTER	RSA.
PARA-HYDROXYBENZOIC ACID, BUTYL ESTER	HN.
PARA-HYDROXYBENZOIC ACID, ETHYL ESTER	HN.
@PARA-HYDROXYBENZOIC ACID, METHYL ESTER	ARS, HN, LEM.
@PARA-HYDROXYBENZOIC ACID, PROPYL ESTER	ARS, HN, LEM.
2-HYDROXY-4-METHOXYBENZOPHENONE	ACY, GAF, GLY.
2-HYDROXY-4-METHOXY-5-SULFOBENZOPHENONE TRIHYDRATE	ACY.
2-(2-HYDROXY-5-TERT-OCTYLPHENYL)BENZOTRIAZOLE	ACY.
ISOPROPYL-ORTHO-CRESOLS	CP, UCC.
LACTONES:	
BUTYROLACTONE	GAF.
GLUCONO-DELTA-LACTONE	PFZ.
@MALEIC ANHYDRIDE	HN, KPT, MON, PTT, RCI, USS.
PARA-MENTHANE	HPC.
8-PARA-MENTHYL HYDROPEROXIDE	HPC.
PARA-METHOXYBENZYLIDENEMALONIC ACID, DIETHYL AND DIMETHYL ESTERS	ACY.
PARA-METHOXYBENZYLIDENEMALONIC ACID, DIMETHYL ESTER	ACY.
4-METHOXYPHENOL	ARS, ASL, EKT.
2,2'-METHYLENEBIS*4-CHLOROPHENOL*	GIV.
2,2'-METHYLENEBIS*3,4,6-TRICHLOROPHENOL* (HEXACHLOROPHENE)	GIV.
METHYL GALLATE	HSH.
4-METHYLMORPHOLINE	JCC, UCC.
1-METHYL-2-PYROLIDONE,MONOMER	GAF.
MIXTURE OF PARA- AND ORTHO-AMYL DIMETHYLAMINOBENZOATE	EVN, VND.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, CYCLIC--CONTINUED	
MORPHOLINE	DOW, JCC, UCC.
MORPHOLINE SALT OF PARA-TOLUENE SULFONIC ACID	AMB.
PHENOTHIAZINE	WAG.
2-PHENOXYETHANOL (ETHYLENE GLYCOL MONOPHENYL ETHER)	DOW, TCH.
2-(2-PHENOXYETHOXY)ETHANOL (DIETHYLENE GLYCOL PHENYL ETHER)	DOW.
PHENYL MERCURIC BORATE	TRO.
PHTHALIC ACID, LEAD SALT, (DIBASIC)	NTL.
PICRAMIC ACID, SODIUM SALT	SDC.
@ALPHA-PINENE	ARZ, CBY, NCI.
@BETA-PINENE	ARZ, CBY, HPC, NCI.
PINENE SULFATE	HPC.
PINENE, WOOD	HPC.
POLY-4-(2-ACRYLOXYETHOXY)-2-HYDROXY BENZOPHENONE	ACY.
PROPYL GALLATE	EKT, HSH.
PYROGALLOL	HSH, MAL.
2-PYRROLIDONE (2-PYRROLIDINONE)	MRK.
RESORCINOL MONOBENZOATE	EKT.
ROSIN ACID SALTS:	
CALCIUM RESINATE	CBY.
CALCIUM ZINC RESINATE	CBY.
ROSIN ACID SALTS, ALL OTHER	HPC.
SALICYLANILIDE	PCW.
SALICYLIC ACID, LEAD SALT	NTL.
STYRENE OXIDE	UCC.
SUCCINIC ANHYDRIDE	ACS, ORO.
TALL OIL, CHEMICALLY MODIFIED	POC, X.
TALL OIL SALTS (LINOLEIC-ROSIN ACID SALTS):	
CALCIUM MANGANESE TALLATE	MCI.
@CALCIUM TALLATE	CCA, HN, MCI.
COBALT TALLATE	CCA, HN, MCI, SHP.
@LEAD MANGANESE TALLATE	MCI.
LEAD TALLATE	CCA, HN, MCI.
MANGANESE TALLATE	HN, MCI.
TRI(OXYALUMINUM ISOPROPOXIDE)	KCH.
TRI(OXYALUMINUM TALLATE)	KCH.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, CYCLIC--CONTINUED	
TALL OIL SALTS (LINOLEIC-ROSIN ACID SALTS)--CONTINUED	
ZINC TALLATE	MCI.
TALL OIL SALTS, ALL OTHER (LINOLEIC-ROSIN ACID SALTS)	ZGL.
TANNIC ACID, TECHNICAL	HSH.
TANNIC ACID, U.S.P.	HSH, MAL.
TERPINE HYDROCARBONS, MONOCYCLIC (SOLVENOL)	GLD, NCI.
TETRABIS(METHYLENE-3-(3',5'-DI-TERT-BUTYL-4'-HYDROXYPHENOL)PROPIONATE)METHANE	EK.
2,3,5,6-TETRACHLORO-4-(METHYLSULFONYL) PYRIDINE	DOW.
1,2,3,4-TETRAHYDRONAPHTHALENE	DUP.
TETRAHYDROTHIOPHENE	PAS.
1,3,6,8-TETRANITROCARBAZOLE	SDC.
TETRAPHENYLTIN	X.
TETRAPHENYLTIN CHLORIDE	X.
TETRAPHENYLTIN HYDROXIDE	X.
2,2'-THIOBIS(4-OCTYLPHENOLATE)-NORMAL-BUTYLAMINE NICKEL SALT	ACY.
THIOPHENE	PAS.
TRIALLYL CYANURATE	ACY.
3,4,4'-TRICHLOROCARBANILIDE	MON.
1,3,5-TRICHLORO-S-TRIAZINE-2,4,6-(1H,3H,5H)TRIONE (TRICHLOROISOCYANURIC ACID)	MON.
1,2,3-TRIKETOHYDRINDENE HYDRATE	PIC.
3,5,5-TRIMETHYL-2-CYCLOHEXENE-1-ONE	GCC, MSC.
2,4,6-TRINITRORESORCINOL AND LEAD DERIVATIVE	REM.
S-TRIOXANE	MSC.
TRIPHENYL PHOSPHITE	GCC, MON, MSC.
1-VINYL-2-PYRROLIDINONE, MONOMER	GAF.
1-VINYL-2-PYRROLIDINONE-OTHER COPOLYMERS	GAF.
1-VINYL-2-PYRROLIDINONE-VINYL ACETATE COPOLYMER	GAF, UCC.
@CYCLIC CHEMICALS, ALL OTHER	ACY, ALB, ALD, AMB, ARA, ABS, AZT, CGY(E), DOW, EK, EKT, ENJ(E), FIN, FMP(E), FMT, GAF, GIV, GTL, HPC, JCC, MIL, MON, PAS, PD, PIC, PLC, SAL, SM, TNI, TRO, UCC, UPJ, VTC, WAY, WTL, X, X, X(E).

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, ACYCLIC:	
NITROGENOUS COMPOUNDS:	
ACETAMIDOETHANOL (N-ACETYL-ETHANOLAMINE)	SBC.
ACETONE SEMICARBAZONE	NOR.
1-ALLYL-3-(2-HYDROXYETHYL)-2-THIOUREA	FMT.
AMIDES:	
ACETAMIDE	ACS.
ACRYLAMIDE MONOMER	FMT, NLC.
1,1'-AZOBISFORMAMIDE	NPI, USR.
N,N-BIS(2,2-ACETAMIDE)GLYCINE	HMP.
CHLORO-N-(2-HYDROXYETHYL)ACETAMIDE	KF.
N,N-DIETHYLDODECANAMIDE	EK.
N,N-DIMETHYLACETAMIDE	DUP.
3-DIMETHYLFORMAMIDE	AIP, DUP.
ERUCAMIDE	ASH, FIN.
ERUCAMIDE - LAURAMIDE	FIN.
N,N'-ETHYLENEBIS(STEARAMIDE)	CCW.
FORMAMIDE	DUP.
HEXAMETHYL PHOSPHORIC TRIAMIDE	DUP.
12-HYDROXYSTEARAMINE	CCW.
METHACRYLAMIDE	DUP.
N,N'-METHYLENEBIS(ACRYLAMIDE)	ACY.
OLEAMIDE	ARC, FIN, GLY.
OLEOYLPALMITAMIDE	FIN.
STEARAMIDE (OCTADECANE AMIDE)	ARC, FIN, GLY.
STEARYLERUCAMIDE	FIN.
TALLOW AMIDE, HYDROGENATED	ARC.
AMIDES, ALL OTHER	ACY, ALB, ARS, FIN, HAL, KF, UPJ, VGC.
AMINES:	
ALLYLAMINES	SHC.
AMINE POLYMERS	X.
BIS-HEXAMETHYLENE TRIAMINE AMINE	DUP.
BUTYLAMINES:	
NORMAL BUTYLAMINE, MONO	PAS, VGC.
SEC-BUTYLAMINE, MONO	PAS.
TERT-BUTYLAMINE, MONO	MON.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, ACYCLIC--CONTINUED	
@BUTYLAMINES--Continued	
DI-NORMAL-BUTYLAMINE	PAS, VGC.
DIISOBUTYLAMINE	AIP, VGC.
TRI-NORMAL-BUTYLAMINE	PAS, VGC.
NORMAL-BUTYLETHYLAMINE	PAS, VGC.
DIETHYLENETRIAMINE	DOW, UCC.
DIISOPROPYLAMINE	PAS, UCC, VGC.
DIMETHYLAMINOPROPYLAMINE	JCC.
ETHYLAMINES:	
@DIETHYLAMINE	AIP, PAS, UCC, VGC.
@ETHYLAMINE, MONO-	AIP, PAS, UCC, VGC.
TRIETHYLAMINE	PAS, UCC.
ETHYLENEDIAMINE	DOW, UCC.
(2-ETHYLHEXYL)AMINE, MONO-	VGC.
@1,6-HEXANEDIAMINE (HEXAMETHYLENEDIAMINE)	CEL, DUP, ELP, MON.
3,3'-IMINOBISPROPYLAMINE	JCC.
@ISOPROPYL AMINE, MONO-	AIP, PAS, UCC, VGC.
METHYLAMINES:	
@DIMETHYLAMINE	AIP, DUP, GAF.
DIMETHYLAMINE SULFATE	GLY, RH.
METHYLAMINE, MONO-	AIP, DUP, GAF.
TRIMETHYL AMINE	AIP, DUP, GAF.
NORMAL OCTYLAMINE, MONO-	VGC.
PENTAETHYLENEHEXAMINE	UCC.
PENTYLAMINES (AMYLAMINES):	
DIPENTYLAMINE	PAS.
PENTYLAMINE, MONO-	PAS.
1,3-PROPANEDIAMINE	JCC.
PROPYLAMINES:	
DIPROPYLAMINE	AIP, VGC.
PROPYLAMINE, MONO-	AIP, PAS, VGC.
TRIPROPYLAMINE	PAS, VGC.
TETRAETHYLENE PENTAMINE	DOW, UCC.
N,N,N',N'-TETRAMETHYL-1,3-BUTANEDIAMINE	UCC.
TETRAMETHYLETHYLENEDIAMINE	BOR, RH.
TRIETHYLENETETRAMINE	DOW, UCC.
AMINES, ALL OTHER	AAC, ADB, ALB, BAS, DOW, EK, JCC, NLC, ONX, RH, UCC,

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, ACYCLIC--CONTINUED	, VGC, WAY, X, X.
2-AMINO-1-BUTANOL	IMC.
1-AMINOETHANOL	BOR.
AMINOETHOXYETHANOL	JCC.
@ 2-(2-AMINOETHYLAMINO)ETHANOL (AMINOETHYLETHANOLAMINE)	BOR, DOW, HDG, UCC.
AMINOETHYL MERCAPTOACETATE (MONOETHANOLAMINE THIOGLYCOLATE)	EVN.
2-AMINO-2-ETHYL-1,3-PROPANEDICL	IMC.
2-AMINO-2-(HYDROXYMETHYL)-1,3-PROPANEDIOL *TRIS(HYDROXYMETHYL)AMINOMETHANE*	IMC.
2-AMINO-2-METHYL-1,3-PROPANEDIOL	IMC.
2-AMINO-2-METHYL-1-PROPANOL	IMC.
N-BIS(HYDROXYETHYL)AMINO ALKANOL	VAL.
1,3-BIS(HYDROXYMETHYL)UREA	GLY.
BISPERFLUORO ALKYL PHOSPHATE, AMMONIUM SALT	DUP.
BISPERFLUORO ALKYL PHOSPHATE DIETHANOL AMINE SALT	DUP.
BIURET (CARBAMYL UREA)	DOW.
1-BUTYL-3-ETHYL-2-THIOUREA	PAS.
BUTYL ISOCYANATE	OTC(E), UPJ.
CHLOROCHOLINE CHLORIDE	ACY.
2-CHLORO-N,N-DIETHYLETHYLAMINE HYDROCHLORIDE	VEL.
2-CHLORO-N,N-DIMETHYLETHYLAMINE (DIMETHYLAMINO ETHYL CHLORIDE) HYDROCHLORIDE	SK, VEL.
2-CHLORO-N,N-DIMETHYLPROPYLAMINE HYDROCHLORIDE	VEL.
3-CHLORO-N,N-DIMETHYLPROPYLAMINE HYDROCHLORIDE	SK, VEL.
2-CHLOROTRIETHYLAMINE HYDROCHLORIDE	CGY.
CHOLINE BASE	RH.
COCONUT OIL ACID - AMMONIUM CONDENSATE	MIL.
CYANOACETIC ACID	KF.
DIBUTYL AMINES (TALLOW FATTY QUATRARINES)	NTL.
2-DIBUTYLAMINOETHANOL	PAS.
1,3-DIBUTYL-2-THIOUREA	PAS.
1,4-DICYANOBUTENE	DUP.
DIETHYLAMINOETHANETHIOL HCL	EVN.
2-DIETHYLAMINOETHANOL (N,N-DIETHYLETHANOLAMINE)	PAS, UCC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, ACYCLIC--CONTINUED	
2-(2-DIETHYLAMINOETHOXY)ETHANOL	CPS.
2-DIETHYLAMINOETHYL METHACRYLATE	DUP.
DIETHYLHYDROXYLAMINE	PAS.
1,3-DIETHYL-2-THIOUREA	PAS, RBC.
2-DIISOPROPYLAMINOETHANOL (N,N-DIISOPROPYLETHANOLAMINE)	PAS.
DIMTHYLAMINOETHYL ACRYLATE	CPS.
2-DIISOPROPYLAMINOETHYL METHACRYLATE	X.
2-DIMETHYLAMINOETHANETHIOL HYDROCHLORIDE	EVN.
2-DIMETHYLAMINOETHANOL (N,N-DIMETHYLETHANOLAMINE)	AAC, PAS, UCC.
DIMETHYLAMINOETHYL METHACRYLATE	AAC, CPS.
DIMETHYLAMINO-2-PROPANOL	PAS.
3-DIMETHYLAMINOPROPYL CHLORIDE	PFZ.
1,1-DIMETHYLHYDRAZINE	FMP(E).
DIMETHYL ISOCYANATE	GNM.
ETHANOLAMINES:	
@2,2'-AMINODIETHANOL	DOW, JCC, OMC, UCC.
@2-AMINOETHANOL	DOW, GLY, JCC, OMC, UCC.
@2,2',2''-NITRILOTRIETHANOL	DOW, JCC, OMC, UCC.
2-ETHYLAMINOETHANOL	PAS, UCC.
ETHYLCYANOACETATE	KF.
FORMAMIDINE DISULFIDE DIHYDROCHLORIDE	WAY.
GLYCINE	CHT.
GLYCINE ETHYL ESTER HYDROCHLORIDE	SFS.
4-GUANYL-1-NITROSOGUANYL-1-TETRAZENE	REM.
HEXAMETHYLENEDIAMMONIUM ADIPATE	CEL, DUP, MON.
HYDROXYALKYLAMINO GLUCONAMIDE	VND.
ISOPROPANOLAMINES:	
1-AMINO-2-PROPANOL	DOW, UCC.
1,1'-IMINODI-2-PROPANOL	DOW.
1,1',1''-NITRILOTRI-2-PROPANOL (TRIISOPROPANOLAMINE)	DOW.
2-ISOPROPYL AMINOETHANOL	PAS.
ISOPROPYL ETHYLTHIONOCARBAMATE	DOW.
KETIMINE, TETRAFUNCTIONAL	GNM.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, ACYCLIC--CONTINUED	
3-METHOXYPROPYLAMINE	JCC.
2-METHYLAMINOETHANOL	PAS, UCC.
METHYL CARBAMATE	BKL.
METHYL CYANOACETATE	KF.
METHYL ALPHA-CYANOACRYLATE	EKT.
2,2'-(METHYLIMINO)DIETHANOL	PAS, UCC.
METHYL ISOCYANATE	UCC.
N-METHYLTAURINE	GAF.
MONOETHANOLAMINE SULFITE	EVN.
NITRATED LARD OIL	SM.
NITRILES:	
ACETONITRILE	DUP, EKX, MON, SOH(E).
@ACRYLONITRILE, MONOMER	ACY, DUP, MON, SOH(E).
ADIPONITRILE	DUP, ELP, MON.
2,2'-AZOBIS*2-METHYLPROPIONITRILE* (AZOBISISOBUTYRONITRILE)	DUP.
NORMAL-BUTYRONITRILE	EKX.
COCONITRILE	ASH.
3-DIMETHYLAMINOPROPIONITRILE	ACY.
3-ETHOXYPROPIONITRILE	DIX.
GLYCOLONITRILE	KF.
HYDRACRYLONITRILE	TKL.
ISOBUTYRONITRILE	EKX.
LACTONITRILE	MON.
METHACRYLONITRILE	DOW.
METHYL ISOBUTYL KETONE AMINONITRILE	HMP.
2-METHYLLACTONITRILE	DUP, MON, RH.
2-PENTENENITRILE	DUP.
STEARONITRILE (OCTADECANE NITRILE)	ARC, ASH.
TALLOW NITRILE	ASH.
TALLOW NITRILE, HYDROGENATED	ASH.
3,3'-THIODIPROPIONITRILE	ACY, EVN.
NITRILES, ALL OTHER	ABB, ASH, KF.
NITROETHANE	IMC.
NITROMETHANE	IMC.
1-NITROPROPANE	IMC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS, ACYCLIC--CONTINUED	
2-NITROPROPANE	IMC.
OCTADECYL ISOCYANATE	MOB(E), UPJ.
PENTAERYTHRITOL TETRANITRATE	DUP, HPC.
PENTYLNITRATE (AMYL NITRATE)	TNA(E).
NORMAL-PROPYL CARBAMATE	BKL.
PROPYLISOCYANATE	OTC(E).
SARCOSINE	CGY(E), HMP.
SEMICARBAZIDE HYDROCHLORIDE	FMT.
N,N,N',N'-TETRAKIS(2-HYDROXYPROPYL)ETHYLENEDIAMINE	BAS.
TETRAMETHYLAMMONIUM CHLORIDE	RSA.
TETRAMETHYLGUANIDINE	ACY.
THIOACETAMIDE	RBC.
THIOSEMICARBAZIDE	ACY.
NITROGENOUS COMPOUNDS, ACYCLIC, ALL OTHER	AAC, AAC, ACS, ARC, BME, CHP, CPS, CWN, DAN, DUP, EK, , EK, HMP, IMC, JCC, MOB(E), NLC, OTC(E), PAS, RH, RSA, SCP, SNW(E), STC, TKL, USR, VAL, VEL, WAY, WYC X, X, X, X, X.
ACIDS, ACID ANHYDRIDES, AND ACYI HALIDES:	
ACETIC ACID, 100%:	
ACETIC ACID, RECOVERED	CEL, EKT, MON, RDA, UCC.
@ACETIC ACID, SYNTHETIC	BOR, CEL, EKT, FMP, MON, PUB(E), UCC.
@ACETIC ANHYDRIDE, 100%:	
ACETIC ANHYDRIDE FROM ACETALDEHYDE	EKT.
ACETIC ANHYDRIDE FROM ACETIC ACID, OTHER THAN RECOVERED, BY THE VAPOR-PHASE PROCESS	CEL, UCC.
ACETIC ANHYDRIDE FROM ACETIC ACID, RECOVERED, BY VAPOR PHASEPROCESS	AV, CEL.
@ACRYLIC ACID	CEL, DBC, UCC.
@ADIPIC ACID	ALF, CEL, DUP, MON, NLC.
AZELAIC ACID	EMR(E).
TERT-BUTYL PEROXYMALEIC ACID	WTC.
BUTYRIC ACID	CEL, EKT.
BUTYRIC ANHYDRIDE	CCL, EKT.
CASTOR OIL FATTY ACIDS, DEHYDRATED	DA, NTL.
CHLOROACETIC ACID, MONO-	BUK, DOW, PFZ.
CHLOROACETYL CHLORIDE	DOW.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACIDS, ACID ANHYDRIDES, AND ACYL HALIDES--CONTINUED	
CITRIC ACID	MLS, PFZ.
CROTONIC ACID	EKT.
DECANOYL CHLORIDE	WTL.
2,2-DICHLOROPROPANOIC ACID	DOW.
DIMER ACID	UPM.
DI-NORMAL-PROPYLACETIC ACID	ARA.
DI-NORMAL-PROPYLACETYL CHLORIDE	ARA.
DITHIODIPROPIONIC ACID	EVN.
DODECANEDIOIC ACID	DUP.
DODECENYLSUCCINIC ANHYDRIDE	ACS, DIX, HMY.
DODECYLSUCCINIC ANHYDRIDE	DIX, HN.
ETHANEDISULFONIC ACID	SK.
2-ETHYLBUTYRIC ACID (DIETHYLACETIC ACID)	UCC.
2-ETHYLHEXANOIC ACID	EKT, UCC.
2-ETHYLHEXANOYL CHLORIDE	AZT, WTL.
FORMIC ACID, 90%	CEL, UCC.
@FUMARIC ACID	HN, MON, PFZ, USS.
GLUCONIC ACID, TECHNICAL	PFZ.
GLUTARIC ANHYDRIDE	UCC.
GLYCOLIC ACID	DUP.
NORMAL-HEXADECENYLSUCCINIC ANHYDRIDE	HMY.
ISETHEONIC ACID	GAF, WTC.
ISOASCORBIC ACID (ERYTHORBIC ACID)	MRK, PFZ.
ISOBUTYRIC ACID	EKX.
ISOBUTYRIC ANHYDRIDE	EKT.
ISOBUTYRYL CHLORIDE	WTL.
ISO-OCTADECENYLSUCCINIC ANHYDRIDE	HMY.
ITACONIC ACID	PFZ.
2-KETO-D-GLUCONIC ACID	MRK.
LACTIC ACID:	
LACTIC ACID, EDIBLE, 100%	CLN, MON.
LACTIC ACID, TECHNICAL, 100%	MON.
@LAUROYL CHLORIDE	GAF, ONX, UOP, WTL.
MALEIC ACID	ACS, PFN, PFZ.
MALIC ACID	ACS.
MERCAPTOACETIC ACID	EVN.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACIDS, ACID ANHYDRIDES, AND ACYL HALIDES--CONTINUED	
3-MERCAPTOPROPIONIC ACID	EVN.
MERCAPTOSUCCINIC ACID	EVN.
METHACRYLIC ACID	DUP, RH.
METHANESULFONIC ACID	EK, PAS.
METHANESULFONYL CHLORIDE	PAS.
NEODECANOYL CHLORIDE	ENJ(E), WTL.
NEOPENTANOIC ACID	ENJ(E).
NONANOIC ACID	EMR(E), GIV.
NONENYLSUCCINIC ANHYDRIDE	HMY.
OCTANOYL CHLORIDE	X.
OCTENYLSUCCINIC ANHYDRIDE	HMY.
OLEIC ACID	ASH.
OLEOYL CHLORIDE	GAF, HRT.
OXALIC ACID	ACS, PFZ.
PALMITOYL CHLORIDE	GAF, PD.
PEROXYACETIC ACID	FMB, UCC.
PIVALOYL CHLORIDE	AZT, WTL.
@POLYACRYLIC ACID	BFG, DA, RH, TKL, X.
@PROPIONIC ACID	CEL, EKT, IMC, UCC.
PROPIONIC ANHYDRIDE	EKT.
SEBACOYL CHLORIDE	WTL.
SEBATIC ACID	BAS, WTH.
STEAROYL CHLORIDE	EK, RH, UOP.
SUCCINIC ACID	ACS.
THIOACETIC ACID	EVN.
THIODIGLYCOLIC ACID	EVN.
3,3'-THIODIPROPIONIC ACID	CCW, EVN.
THIODISUCCINIC ACID	EVN.
THIOLACTIC ACID	EVN.
TRICHLOROACETIC ACID	DOW.
VALERIC ACID	UCC.
ACIDS, ACID ANHYDRIDES, AND ACYL HALIDES, ALL OTHER	ARA, BFG, DOW, EK, ENJ(E), PIC, TX, WAY, WTL, X.
SALTS OF ORGANIC ACIDS:	
ACETIC ACID SALTS:	
ALUMINUM ACETATE	ACY, UCC.
AMMONIUM ACETATE	ACS, BKC, MAL.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
SALTS OF ORGANIC ACIDS--CONTINUED	
ACETIC ACID SALTS--CONTINUED	
@BARIUM ACETATE	ACS, BKC, MAL.
CALCIUM ACETATE	ACS, MAL.
COBALT ACETATE	HSH, SHP, UCC.
COPPER ACETATE	ACS, BKC.
LEAD ACETATE	ACS, BKC, MAL.
LEAD SUBACETATE	BKC.
LEAD TETRAACETATE	ARA.
MAGNESIUM ACETATE	BKC, SHP.
MANGANESE ACETATE	HSH, SHP.
MERCURIC ACETATE	MAL.
NICKEL ACETATE	BKC, HSH, SHP.
POTASSIUM ACETATE	ACS, BKC, MAL, UCC.
SODIUM ACETATE	ACS, BKC, CHP, DAN, EKT, MAL, UCC.
SODIUM ALLYL SULFONATES	IOC.
SODIUM DIACETATE	UCC.
@ZINC ACETATE	ACS, BKC, MAL, UCC.
@ZIRCONIUM ACETATE	HSH, SNW(E), TZC.
ADIPIC ACID, AMMONIUM SALT	ASH, ELP.
CHLOROACETIC ACID, SODIUM SALT	DOW.
CITRIC ACID SALTS:	
AMMONIUM CITRATE	MAL, PFZ.
CALCIUM CITRATE	PFZ.
FERRIC AMMONIUM CITRATE	PFZ.
POTASSIUM CITRATE	MLS, PFZ.
SODIUM CITRATE	MLS, PFZ.
2-ETHYLHEXANOIC ACID (ALPHA-ETHYLCAPROIC ACID) SALTS	
ALUMINUM 2-ETHYLHEXANOATE	NOC, WTC.
BARIUM 2-ETHYLHEXANOATE	CCA.
CADMIUM 2-ETHYLHEXANOATE	CCA.
@CALCIUM 2-ETHYLHEXANOATE	CCA, HN, MCI, SW(E), TRO, WTC, X.
@COBALT 2-ETHYLHEXANOATE	CCA, HN, MCI, SW(E), TRO, WTC, X.
COPPER 2-ETHYLHEXANOATE	CCA.
IRON 2-ETHYLHEXANOATE	CCA, HN.
@LEAD 2-ETHYLHEXANOATE	CCA, HN, MCI, NTL, TRO, WTC, X.
@MANGANESE 2-ETHYLHEXANOATE	CCA, HN, MCI, TRO, X.
NICKEL 2-ETHYLHEXANOATE	MCI, WTC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
SALTS OF ORGANIC ACIDS--CONTINUED	
2-ETHYLHEXANOIC ACID (ALPHA-ETHYLCAPROIC ACID) SALTS--CONTINUED	
POTASSIUM 2-ETHYLHEXANOATE	CCA, MCI.
RARE EARTHS 2-ETHYLHEXANOATE	CCA, MCI.
STANNOUS 2-ETHYLHEXANOATE	WTC, X.
@ZINC 2-ETHYLHEXANOATE	CCA, HN, MCI, SW(E), SYP(E), WTC, X.
@ZIRCONIUM 2-ETHYLHEXANOATE	CCA, HN, MCI, TRO, WTC, X.
2-ETHYLHEXANOIC ACID SALTS, ALL OTHER	MCI.
FORMIC ACID SALTS:	
CHROMIC FORMATE	GAF.
LEAD FORMATE	NTL.
NICKEL FORMATE	SHP.
SODIUM FORMATE, REFINED	BKC.
SODIUM FORMATE, TECHNICAL	CEL, PNA.
FORMIC ACID SALTS, ALL OTHER	RSA.
FUMARIC ACID, LEAD SALT	NTL.
GLUCOHEPTANOIC ACID SALTS:	
CALCIUM GLUCOHEPTANOATE	PFN.
SODIUM GLUCOHEPTANOATE	HMP, PFN.
GLUCONIC ACID SALTS:	
SODIUM GLUCONATE	GPR(E), PFZ, SFI.
HUMIC ACIDS, SODIUM SALTS	NLC.
ISOASCORBIC ACID, SODIUM SALT (SODIUM ERYTHORBATE)	MRK, PFZ.
LACTIC ACID SALTS:	
SODIUM LACTATE	MAL, PFN.
LANOLIN ACID, BARIUM SALT	CRN.
LAURIC ACID SALTS:	
LAURIC ACID, BARIUM-CADMIUM SALT	X.
LAURIC ACID SALTS, ALL OTHER	UCC, X.
LINOLEIC ACID SALTS:	
CALCIUM LINOLEATE	CCA, SHP.
LEAD LINOLEATE	SHP.
MANGANESE LINOLEATE	SHP.
@MALEIC ACID SALTS:	
MALEIC ACID, DIBUTYLTIN SALT	X.
MALEIC ACID, TRIBASIC LEAD SALT	NTL.
MALEIC ACID SALTS, ALL OTHER	MET, WTL.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MERCAPTOACETIC ACID (THIOGLYCOLIC ACID) SALTS:	
AMMONIUM MERCAPTOACETATE	CCA, EVN.
CALCIUM MERCAPTOACETATE	CCA, EVN.
POTASSIUM MERCAPTOACETATE	EVN.
SODIUM MERCAPTOACETATE	EVN.
MERCAPTOACETIC ACID (THIOGLYCOLIC ACID) SALTS, ALL OTHER	CCA.
NEODECANOIC ACID SALTS:	
CADMIUM NEODECANOATE	BKL, CCA.
CALCIUM NEODECANOATE	CCA, MCI.
COBALT NEODECANOATE	MCI, SHP.
LEAD-COBALT NEODECANOATE	MCI.
LEAD NEODECANOATE	MCI.
LITHIUM NEODECANOATE	MCI.
MANGANESE NEODECANOATE	MCI.
ZINC NEODECANOATE	CCA, SHP.
ZIRCONIUM NEODECANOATE	MCI.
NEODECANOIC ACID SALTS, ALL OTHER	CCA.
OCTANOIC-ACID (CAPRYLIC ACID) SALTS:	
ALUMINUM OCTANOATE	DA.
STANNOUS OCTANOATE	X.
OCTANOIC ACID (CAPRYLIC ACID) SALTS, ALL OTHER	X.
@OLEIC ACID SALTS:	
COPPER OLEATE	WTC.
LEAD OLEATE	NOC.
STANNOUS OLEATE	X.
OLEIC ACID SALTS, ALL OTHER	HAL, SHP.
OXALIC ACID SALTS:	
AMMONIUM OXALATE	ACS.
FERRIC OXALATE	SHP.
POTASSIUM OXALATE	BKC.
SODIUM OXALATE	BKC.
PALMITIC ACID SALTS:	
ALUMINUM PALMITATE	DA.
PHOSPHORODITHIOIC ACID SALTS (DITHIOPHOSPHATES):	
SODIUM DI-SEC-BUTYL PHOSPHORODITHIOATE	ACY.
SODIUM DI-SEC-BUTYL/DIETHYL PHOSPHORODITHIOATE	ACY.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
PHOSPHORODITHIOIC ACID SALTS (DITHIOPHOSPHATES)--CON'T:	
SODIUM DIETHYL PHOSPHORODITHIOATE	ACY.
SODIUM DIHEXYL PHOSPHORODITHIOATE	ACY.
SODIUM DIISOPROPYL PHOSPHORODITHIOATE	ACY.
PHOSPHORODITHIOC ACID SALTS (DITHIOPHOSPHATES), AL L OTHER	ACY.
PROPIONIC ACID SALTS:	
CALCIUM PROPIONATE	HFT, PFZ.
POLYFLUOROALKYL THIOPROPIONIC ACID, LITHIUM SALT	DUP.
SODIUM PROPIONATE	HFT, PFZ.
PROPIONIC ACID SALTS, ALL OTHER	EW.
RICINOLEIC ACID SALTS:	
CALCIUM RICINOLEATE	NTL.
LITHIUM RICINOLEATE	NTL.
SODIUM ETHYLOXALACETATE	FMP(E).
SODIUM GLYCOLATE	SAL.
SODIUM SORBITOL BORATE	ICI.
STEARIC ACID SALTS:	
ALUMINUM STEARATES:	
@ALUMINUM DISTEARATE	DA, NOC, PEN(E), SYP, WTC.
ALUMINUM MONOSTEARATE	DA, NOC, SYP, WTC.
@ALUMINUM TRISTEARATE	DA, NOC, PEN(E), SYP, WTC.
AMMONIUM STEARATE	DA.
@BARIUM STEARATE	DA, NOC, PEN(E), SYP, WTC.
CADMIUM STEARATE	SYP, WTC.
@CALCIUM STEARATE	DA, FER, HN, MAL, NOC, PEN(E), SYP, WTC, X.
@COBALT STEARATE	SHP, WTC, X.
FERRIC STEARATE	SHP, WTC.
@LEAD STEARATE	NTL, WTC, X.
LITHIUM STEARATE	DA, NOC, PEN(E), WTC.
@MAGNESIUM STEARATE	DA, MAL, NOC, PEN(E), SYP, WTC.
@NICKEL STEARATE	WTC.
@ZINC STEARATE	DA, HN, MAL, NOC, PEN(E), PLS, SYP, WTC, X.
STEARIC ACID SALTS, ALL OTHER	NOC, NTL, SNW(E), WTC.
SUCCINIC ACID, SODIUM SALT	MAL.
@TARTARIC ACID SALTS:	
ANTIMONY POTASSIUM TARTRATE	HSH, PFZ.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@TARTARIC ACID SALTS--CONTINUED	
POTASSIUM BITARTRATE	ACY.
POTASSIUM SODIUM TARTRATE	PFZ.
XANTHIC ACID SALTS:	
POTASSIUM AMYLXANTHATE	DOW.
POTASSIUM ETHYLXANTHATE	DOW.
POTASSIUM ISOPROPYLXANTHATE	BAS.
POTASSIUM PENTYLXANTHATE	ACY.
SODIUM NORMAL-BUTYLXANTHATE	KCC.
SODIUM SEC-BUTYLXANTHATE	DOW.
SODIUM ETHYLXANTHATE	DOW.
SODIUM ISOBUTYLXANTHATE	DOW.
SODIUM ISOPROPYLXANTHATE	DOW.
XANTHIC ACID SALTS, ALL OTHER	DOW.
SALTS OF ORGANIC ACIDS, ALL OTHER	CCA, DA, HSH, MCI, NPI, TCH, UCC, UOP, WTC.
ALDEHYDES:	
ACETALDEHYDE	CEL, EKX, PUB(E), SHC, UCC.
ACROLEIN	SHC, UCC.
@BUTYRALDEHYDE	CEL, EKX, UCC.
CHLORAL	DA, MTO.
CROTONALDEHYDE	EKT.
2-ETHYLBUTYRALDEHYDE	UCC.
2-ETHYLHEXANAL (ALPHA-ETHYLCAPROALDEHYDE)	EKX.
@FORMALDEHYDE (37% BY WEIGHT)	AMP, BOR, CBD, CEL, DUP, GAF, GOC, GP, HKD, HN, HPC, IMC, MON, RCI, SKO, UCC.
GLUTARALDEHYDE	UCC.
GLYOXAL	ACY, UCC.
ISOBUTYRALDEHYDE	CEL, DBC, EKX, UCC.
@ISOPENTALDEHYDE, MIXED ISOMERS	UCC.
METHACROLEIN	RDA.
2-METHYLVALERALDEHYDE	UCC.
PROPIONALDEHYDE	EKX, UCC.
VALERALDEHYDE (PENTANAL)	UCC.
ALDEHYDES, ACYCLIC, ALL OTHER	EKT, UCC, X.
KETONES:	
ACETONE:	
@ACETONE FROM CUMENE	ACS, CLK, DOW, GP, GYR, MON, SOC, UCC, USS.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
KETONES--CONTINUED	
ACETONE--CONTINUED	
ACETONE FROM ISOPROPYL	DIX, EKT, ENJ(E), SHC, UCC.
ACETONE, ALL OTHER	OCC.
ACETONE, CRUDE	BAL.
@2-BUTANONE	CEL, DIX, ENJ(E), SHC, UCC.
CHLORO-2-PROPANONE	EK.
DIISOPROPYL KETONE	EKX.
2-HEPTANONE	EKT.
3-HEPTANONE	UCC.
2,5-HEXANEDIONE (ACETONYLACETONE)	ARS.
@4-HYDROXY-4-METHYL-2-PENTANONE	CEL, SHC, UCC.
ISOVALERONE	UCC.
LACTIDE	CLN.
4-METHOXY-4-METHYL-2-PENTANONE	SHC.
5-METHYL-2-HEXANONE (METHYL ISOAMYL KETONE)	EKT.
@4-METHYL-2-PENTANONE	EKT, ENJ(E), SHC, UCC.
@4-METHYL-3-PENTEN-2-ONE	ENJ(E), SHC, UCC.
2-OCTANONE	WTH.
2,4-PENTANEDIONE	UCC.
@3-PENTANONE	HEX, ORT, UCC.
PSEUDOIONONE	GLD, RDA.
KETONES, ALL OTHER	ABB, ARC, MRK, SHC, UCC.
@ALCOHOLS, MONOHYDRIC, UNSUBSTITUTED:	
@ALCOHOLS, C11 OR LOWER, UNMIXED (95% OR MORE PURE):	
ALLYL ALCOHOL	FMP, SHC.
AMYL ALCOHOLS:	
2-METHYL-1-BUTANOL	UCC.
1-PENTANOL	UCC.
@BUTYL ALCOHOLS:	
@NORMAL-BUTYL ALCOHOL	CEL, CO, DBC, EKX, GAF, OXO, SHC, TNA(E), UCC.
SEC-BUTYL ALCOHOL	ENJ(E), SHC.
TERT-BUTYL ALCOHOL	SHC, X.
@ISOBUTYL ALCOHOL	CEL, DBC, EKX, OXO, SHC, UCC.
1H,1H,11H-EICOSAFLUORO-1-UNDECANOL	DUP.
@ETHYL ALCOHOL, SYNTHETIC ONLY	EKX, ENJ(E), PUB(E), SHC, UCC, USI.
@2-ETHYL-1-HEXANOL	DBC, EKX, GLY, OXO, SHC, UCC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ALCOHOLS, MONOHYDRIC, UNSUBSTITUTED--CONTINUED	
ALCOHOLS, C11 OR LOWER, UNMIXED (95% OR MORE PURE)--CONTINUED	
2-ETHYL-4-METHYL-1-PENTANOL	EKX, GLY.
NORMAL-HEPTYL ALCOHOL	EKX.
NORMAL-HEXYL ALCOHOL	CO, ENJ(E), TNA(E), UCC.
ISO-OCTYL ALCOHOL	ENJ(E), USS.
@ISOPROPYL ALCOHOL	ATR, ENJ(E), SHC, UCC.
@METHANOL, SYNTHETIC ONLY	AIP, ATR(E), BOR, CEL, DUP, GLY, GP, GYR, HN, HPC, ICI, IMC(E), MON, RH, UCC.
2-METHYL-1-PENTANOL	UCC.
1-OCTANOL	CO.
2-OCTANOL	WTH.
@PROPYL ALCOHOL	CEL, EKX, UCC.
2-PROPYN-1-OL (PROPARGYL ALCOHOL)	GAP.
@ALCOHOLS, UNMIXED C11 OR LOWER, ALL OTHER	ENJ(E), SHC, UCC.
@ALCOHOLS C12 OR HIGHER, UNMIXED (95% OR MORE PURE):	
DODECYL ALCOHOL	CO.
1-HEXADECANOL	CO, PG.
HEXADODECYL ALCOHOL	CO.
ISODECYL ALCOHOL	ENJ(E), USS.
ISOHEXADECANOL	ENJ(E).
1-OCTADECANOL	CO, PG.
CIS-9-OCTADECEN-1-OL	ASH.
1-TETRADECANOL	CO, UCC.
1-TRIDECANOL	ENJ(E).
ALCOHOLS, UNMIXED C12 OR HIGHER, ALL OTHER	SCP.
@MIXTURES OF ALCOHOLS:	
ALCOHOL MIXTURES, ALL OTHER	CO(E), CPS, EKX, ENJ(E), NCI, PG, PUB(E), SHC, TNA(E), UCC.
@ESTERS OF MONOHYDRIC ALCOHOLS:	
ACRYLIC MONOMERS, MIXED	RH.
ALLYL METHACRYLATE	GLY, JCC, SAR(E).
AMYL ACETATES:	
AMYL ACETATE	UCC.
BUTYL ACETATES:	
@NORMAL-BUTYL ACETATE	CEL, EKT, PUB(E), UCC.
SECONDARY-BUTYL ACETATE	PUB(E).
ISOBUTYL ACETATE	CEL, EKX, UCC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ESTERS OF MONOHYDRIC ALCOHOLS--CONTINUED	
BUTYL ACETATES--CONTINUED	
@BUTYL ACRYLATE	CEL, DBC, RH, UCC.
N-BUTYL CHLOROFORMATE	CTN.
SEC-BUTYL CHLOROFORMATE	CTN, WTL.
BUTYL LACTATE	CPS.
BUTYL MALEATE	TCH.
BUTYL MERCAPTOPROPIONATE	EVN.
BUTYL METHACRYLATE	RH, X.
TERT-BUTYL PEROXYACETATE	AZT, WTL.
TERT-BUTYL PEROXY-2-ETHYLHEXANOATE	AZT, WTC.
TERT-BUTYL PEROXYISOBUTYRATE	AZT, WTL.
TERT-BUTYL PEROXYISOPROPYLCARBONATE	WTL.
TERT-BUTYL PEROXYNEODECANOATE	USS, WTC, WTL.
TERT-BUTYL PEROXYPIVALATE	AZT, WTC.
BUTYL STEARATE	CHP.
CETYL LACTATE	SBC, VND.
DIALLYL MALEATE	FMP(E).
DIBUTYL FUMARATE	RCI.
@DIBUTYL MALEATE	HN, MON, RCI, USS.
DIETHYL CARBONATE	CTN, FMP(E).
DIETHYL CHLOROPHOSPHATE	SPA.
DIETHYL(ETHOXYMETHYLENE)MALONATE	KF.
DI(2-ETHYL-1-HEXYL) CHLOROFORMATE	WTL.
@DI(2-ETHYL-1-HEXYL) MALEATE	CHP, DAN, HRT, RUB.
DI(2-ETHYL-1-HEXYL) PEROXYDICARBONATE	WTL.
DIETHYL MALEATE	ACY.
DIETHYL MALONATE	KF.
DIETHYL METHYLMALONATE	SFS.
DIETHYL OXALATE (ETHYL OXALATE)	FMP(E), PFZ.
DIISOBUTYL MALEATE	RUB, WTL.
DIISO-NORMAL MALEATE	RUB.
DIISOPROPYL PEROXYDICARBONATE (ISOPROPYL PERCARBONATE)	PPG.
DILAURYL-3,3'-THIODIPROPIONATE	ACY, CCW, EVN.
DIMETHYL CARBONATE	CTN.
DIMETHYL MALEATE	AAC.
DIMETHYL MALONATE	KF.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ESTERS OF MONOHYDRIC ALCOHOLS--CONTINUED	
BUTYL ACETATES--CONTINUED	
DIOCTYL MALEATE	RCI, USS.
DISTEARYL-3,3'-THIODIPROPIONATE	ACY, EVN.
DITHIOBIS(STEARYL PROPIONATE)	EVN.
DITRIDECYL MALEATE	EPH, RUB.
DI(TRIDECYL)-3,3'-THIODIPROPIONATE	ACY, EVN.
2-ETHOXYETHYL ACETATE	EKX.
@ETHYL ACETATE	CEL, EKT, EKX, ENJ(E), MON, PUB(E), UCC.
ETHYL ACETOACETATE	EKT.
@ETHYL ACRYLATE	CEL, DBC, RH, UCC.
ETHYL-2-BROMOPROPIONATE	ARA.
ETHYL CHLOROACETATE	DOW.
ETHYL CHLOROFORMATE	CTN, EMR(E), FMP(E).
ETHYL CHLOROTHIOLFORMATE	SFA.
ETHYLENE CARBONATE	JCC.
2-ETHYL-1-HEXYL ACETATE	EKT, UCC.
@2-ETHYL-1-HEXYL ACRYLATE	CEL, DBC, UCC.
2-ETHYLHEXYL CHLOROFORMATE	CTN.
2-ETHYL-1-HEXYL METHACRYLATE	DUP.
ETHYL SILICATE	AAC.
FATTY ACID ESTERS, NOT INCLUDED WITH PLASTICIZERS OR SURFACE ACTIVE AGENTS:	
BUTYL PALMITATE	TKL.
ISOPROPYL LINOLEATE	VND.
METHYL ESTERS OF TALLOW	PER.
METHYL 12-HYDROXYSTEARATE	NTL, WTH.
METHYL STEARATE	CHL.
FATTY ACID ESTERS, NOT INCLUDED WITH PLASTICIZERS SURFACE-ACTIVE AGENTS, ALL OTHER	CCW, CHP, CRN, PER, HPC, HUM, UCC, USO, WTC.
HEXYL ACETATE	CPS.
ISOBUTYL ACRYLATE	UCC.
ISOBUTYL CHLOROFORMATE	CTN, OTC(E).
ISOBUTYL ISOBUTYRATE	EKX.
ISODECYL THIOGLYCOLATE	EVN.
ISO-OCTYL MERCAPTOACETATE	CCW, EVN.
ISO-OCTYL-3-MERCAPTOPROPIONATE	EVN.
ISOPROPYL ACETATE	EKT, ENJ(E), UCC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@ESTERS OF MONOHYDRIC ALCOHOLS--CONTINUED	
BUTYL ACETATES--CONTINUED	
ISOPROPYL CHLOROFORMATE	CTN, PPG, WTL.
ISOSTEARYL NEOPENTANOATE	VND.
LAURYL LACTATE	VND.
LAURYL METHACRYLATE	RH, X.
MENTHALLYLIDENE DIACETATE	RDA.
(MIXED ALKYLS) METHACRYLATE MONOMER	DUP.
METHYL ACETATE	GRD, PUB(E), UCC.
METHYL ACETOACETATE	EKT.
METHYL ACRYLATE, MONOMER	CEL, RH.
METHYL BORATE	SFS.
METHYL CHLOROACETATE	DOW.
METHYL CHLOROFORMATE	CTN.
METHYL FORMATE	CEL, DUP.
METHYL METHACRYLATE, MONOMER	ACY, DUP, RH.
METHYL SULFATE	DUP.
METHYL THIOGLYCOLATE	EVN.
MYRISTAL MYRISTATE	VND.
MYRISTYL LACTATE	VND.
OCTADECYL-3-MERCAPTOPROPIONATE	EVN.
@PHOSPHORUS ACID ESTERS:	
BIS(2-ETHYLHEXYL) HYDROGEN PHOSPHATE	SM, UCC.
BUTYL ACID PHOSPHATE	SM.
DIBUTYL HYDROGEN PHOSPHITE	SM.
DIDODECYL HYDROGEN PHOSPHATE	DUP.
DIETHYL HYDROGEN PHOSPHITE	SM.
DIETHYL PHOSPHOROCHLORODITHIONATE	SFA.
DIMETHYL HYDROGEN PHOSPHITE	SM.
DIMETHYL PHOSPHOROCHLORODITHIONATE	SFA.
DIOLEYL HYDROGEN PHOSPHITE	SM.
2-ETHYLHEXYL AMMONIUM ISOOCTYL PHOSPHATE	DUP.
2-ETHYLHEXYL AMMONIUM TRIDECYLPHOSPHATE	DUP.
2-ETHYLHEXYL HYDROGEN PHOSPHATE	SM.
ISO-OCTYL HYDROGEN PHOSPHATE	SM, X.
METHYL DIHYDROGEN PHOSPHATE	HK.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@PHOSPHORUS ACID ESTERS--CONTINUED	
TRIALKYL PHOSPHITE	MCB(E).
TRIBUTYL PHOSPHATE	FMP(E), SPS.
TRIETHYL PHOSPHITE	SPA, SPS, SM.
TRIISO-OCTYL PHOSPHITE	SM.
TRIISOPROPYL PHOSPHITE	SM.
TRIMETHYL PHOSPHITE	SPA, SPS, SM.
TRIS(2-CHLOROETHYL) PHOSPHITE	SM.
TRIS(2,3-DIBROMOPROPYL)PHOSPHATE	DOW, VEL.
TRIS(2-ETHYLHEXYL)PHOSPHITE	SM.
PHOSPHORUS ACID ESTERS, ALL OTHER	HN, MIL, SM.
@PROPYL ACETATE	CEL, EKT, UCC.
PROPYLENE CARBONATE	JCC.
STEARYL METHACRYLATE	RH, TX.
TETRAETHYL ORTHOSILICATE (TETRAETHYL SILICATE)	UCC.
TETRAETHYL SILICATE, CONDENSED	UCC.
TETRAOCTYL ORTHOSILICATE	MON.
TITANIC ACID ESTERS:	
BIS-2-BIS-2-HYDROXYETHYL AMINO ETHYL DIISOPROPYL TITANATE	DUP.
DIISOPROPYL BIS(1-METHYL-3-OXO-1-BUTENYL)TITANATE	DUP.
2-ETHYL-1,3-HEXANEDIOL TITANATE	DUP.
POLYDIBUTYL TITANATE	DUP.
TETRABUTYL TITANATE	DUP.
TETRAISOPROPYL TITANATE	DUP.
TETRAKIS(2-ETHYLHEXYL)TITANATE	DUP.
TRIETHYL ORTHOACETATE	KF.
TRIETHYL ORTHOFORMATE	KF.
TRIETHYL ORTHOPROPIONATE	KF.
TRIISODECYL ORTHOFORMATE	KF.
TRIMETHYL ORTHOFORMATE	KF.
@VINYL ACETATE, MONOMER	BOR, CEL, DUP, NSC, UCC, USI.
@MONOHYDRIC ALCOHOL ESTERS, ALL OTHER	ABB, CTN, DAN, EKT, EMR(E), FER, GLD, MHI, PPG, TKL, UCC, VIK, WTL.
POLYHYDRIC ALCOHOLS:	
2,2-BIS(BROMOMETHYL)-1,3-PROPANEDIOL	DOW.
1,4-BUTANEDIOL	BAS, DUP, GAF.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
POLYHYDRIC ALCOHOLS--CONTINUED	
2-BUTETENE-1,4-DIOL	CEL, GAF.
2-BUTYNE-1,4-DIOL	GAF.
2,2-DIMETHYL-1,3-PROPANEDIOL	EKX.
@ETHYLENE GLYCOL	BAS, CAU, CEL, DIX, DOW, EKX, JCC, NWP, OMC, PPG, SHC, UCC.
2-ETHYL-1,3-HEXANEDIOL	UCC.
2-ETHYL-2-(HYDROXYMETHYL)-1,3-PROPANEDIOL (TRIMETHYL OLPROPANE)	CEL.
@GLYCEROL, SYNTHETIC ONLY	DOW, FMP, SHC.
1,6-HEXANEDIOL	CEL.
MANNITOL	ICI.
2-METHYL-2,4-PENTANEDIOL	SHC.
@PENTAERYTHRITOL	CEL, HPC, IMC(E), PNA.
1,5-PENTANEDIOL	UCC.
@PROPYLENE GLYCOL	DOW, JCC, OCC, OMC, UCC.
@SORBITOL (70% BY WEIGHT)	BRD, ICI, MRK, PFZ.
2,2,4-TRIMETHYL-1,3-PENTANEDIOL	EKX.
POLYHYDRIC ALCOHOLS, ALL OTHER	GAF, GLY, JCC, UCC.
ESTERS AND ETHERS OF POLYHYDRIC ALCOHOLS:	
POLYHYDRIC ALCOHOL ESTERS:	
1,3-BUTANEDIOL DIMETHACRYLATE	SAR(E).
2-(2-BUTOXYETHOXY)ETHYL ACETATE	EKT.
DIETHYLENE GLYCOL, BORATED	GLY.
DIETHYLENE GLYCOL CHLOROFORMATE	PPG.
2-(2-ETHOXYETHOXY)ETHYL ACETATE	EKT.
@ETHYLENE GLYCOL DIACETATE	CPS, EKT, UCC.
ETHYLENE GLYCOL DIMERCAPTOACETATE	EVN.
ETHYLENE GLYCOL DIMETHACRYLATE	SAR(E).
GLYCERYL DIACETATE (DIACETIN)	ARC, HAL.
GLYCERYL MONOACETATE	ARC, HAL.
GLYCERYL MONOTHIOGLYCOLATE	EVN.
GLYCERYL TRIACETATE	EKT, UCC.
1,6-HEXANEDIOL DIACRYLATE	CEL, SAR.
HEXYLENE GLYCOL DIACETATE	UCC.
HYDROXYETHYL ACRYLATE	DOW.
HYDROXYPROPYL ACRYLATE	DOW.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ESTERS AND ETHERS OF POLYHYDRIC ALCOHOLS--CONTINUED	
POLYHYDRIC ALCOHOL ESTERS--CONTINUED	
HYDROXYPROPYL METHACRYLATE	RH.
LANOLIN ALCOHOL ACETATE	CRN.
PENTAERYTHRITOL TETRAACRYLATE	CEL, SAR, UCC.
PENTAERYTHRITOL TETRAKIS (3-MERCAPTOPROPIONATE)	EVN.
POLYETHYLENE GLYCOL DIMETHACRYLATE	SAR(E).
SUCROSE OCTA-ACETATE	HPT, PD.
2-SULFOETHYL METHACRYLATE	DOW.
TETRAETHYLENE GLYCOL DIACRYLATE	CEL, TKL.
TETRAETHYLENE GLYCOL DIMETHACRYLATE	SAR(E).
TRIETHYLENE GLYCOL DIACRYLATE	EKX, TKL.
TRIETHYLENE GLYCOL DIMETHACRYLATE	SAR(E).
@TRIMETHYLOLPROPANE TRIACRYLATE	CEL, SAR, TKL.
TRIMETHYLOLPROPANE TRI(3-MERCAPTOPROPIONATE)	EVN.
POLYHYDRIC ALCOHOL ESTERS, ALL OTHER	CCW, CEL, SAR, TKL, UCC, USB.
POLYHYDRIC ALCOHOL ETHERS:	
BIS(2-ETHOXYETHYL)ETHER (DIETHYLENE GLYCOL DIETHYL ETHER)	UCC.
BIS(HYDROXYETHYL)ETHER BUTYNEDIOL	GAF.
BIS*2-(2-METHOXYETHOXY)ETHYL* ETHER (TETRAETHYLENE GLYCOL DIMETHYL ETHER)	ASL.
BIS(2-METHOXYETHYL)ETHER (DIETHYLENE GLYCOL DIMETHYL ETHER)	ASL.
@2-BUTOXYETHANOL	DOW, EKX, JCC, OMC, SHC, UCC.
@2-(2-BUTOXYETHOXY)ETHANOL (DIETHYLENE GLYCOL MONOBUTYL ETHER)	DOW, EKX, JCC, OMC, SHC, UCC.
2-*2-(2-BUTOXYETHOXY)ETHOXY*ETHANOL (TRIETHYLENE GLYCOL MONOBUTYL ETHER)	DOW, OMC, UCC.
1-BUTOXYETHOXY-2-PROPANOL	UCC.
@DIETHYLENE GLYCOL	BAS, CEL, DIX, DOW, EKX, JCC, NWP, OMC, PPG, SHC, UCC.
DIMETHOXYETHANE	ASL.
@DIPROPYLENE GLYCOL	DOW, JCC, OCC, OMC, UCC.
@2-ETHOXYETHANOL	DOW, EKX, JCC, OMC, SHC, UCC.
@2-(2-ETHOXYETHOXY)ETHANOL (DIETHYLENE GLYCOL MONOETHYL ETHER)	DOW, EKX, JCC, OMC, SHC, UCC.
@2-*2-(2-ETHOXYETHOXY)ETHOXY*ETHANOL (TRIETHYLENE GLYCOL MONOETHYL ETHER)	DOW, OMC, UCC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
POLYHYDRIC ALCOHOL ETHERS--CONTINUED	
2-*2-(HEXYLOXY)ETHOXY*ETHANOL	UCC.
ISOBUTOXYETHANOL	UCC.
1-ISOBUTOXY-2-PROPANOL (PROPYLENE GLYCOL ISOBUTYL ETHER)	DOW.
@2-METHOXYETHANOL (ETHYLENE GLYCOL MONOMETHYL ETHER)	DOW, JCC, OMC, PPG, SHC, UCC.
@2-(2-METHOXYETHOXY)ETHANOL (DIETHYLENE GLYCOL MONOMETHYL ETHER)	DOW, JCC, OMC, PPG, SHC, UCC.
@2-*2-(2-METHOXYETHOXY)ETHOXY*ETHANOL (TRIETHYLENE GLYCOL MONOMETHYL ETHER)	DOW, OMC, UCC.
2-(2-METHOXYETHOXY)ETHYL-2-METHOXYETHYL ETHER (TRIETHYLENE GLYCOL DIMETHYL ETHER)	ASL.
METHOXYPOLYETHYLENE GLYCOL	DUP, UCC.
1-METHOXY-2-PROPANOL	DOW.
3-(3-METHOXYPROPOXY)PROPANOL	DOW.
3-*3-(3-METHOXYPROPOXY)PROPOXY*PROPANOL	DOW, DUP.
PARAFORMALDEHYDE	CEL, HN.
POLYBUTYLENE GLYCOL	NLC.
@POLYETHYLENE GLYCOL	BAS, CAU, DA, DOW, DUP, HDG, JCC, OMC, TCH, UCC.
POLYPROPOXY ETHERS:	
POLYPROPOXYBUTYL ETHER	BAS, DA.
POLYPROPOXY ETHERS, ALL OTHER	JCC, TNI, UCC.
POLYGLYCOLS, ETHYLENE GLYCOL AND GLYCOL ETHER, MIXED	DOW, UCC.
@POLYPROPYLENE GLYCOL	BAS, DOW, HDG, JCC, OMC, UCC.
POLYTETRAMETHYLENE GLYCOL ETHER	DUP, QKO.
PROPYLENE GLYCOL, MIXED ETHERS	BAS, DOW, JCC.
SORBITOL, ETHOXYLATED	GLY, ICI, TCH.
SORBITOL, PROPOXYLATED	ICI.
@TETRAETHYLENE GLYCOL	DOW, EKX, OMC, UCC.
1,1,3,3-TETRAMETHOXYPROPANE	KF.
TRIETHYLENE GLYCOL	CEL, DOW, EKX, JCC, NWP, OMC, PPG, SHC, UCC.
TRIPROPYLENE GLYCOL	DOW, HDG, UCC.
POLYHYDRIC ALCOHOL ETHERS, ALL OTHER	CRN, EKX, SBC, TCH, UCC.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@HALOGENATED HYDROCARBONS:	
BROMINATED (INCLUDING BROMOCHLORINATED) HYDROCARBONS	
BROMOCHLOROMETHANE	DOW.
1-BROMO-3-CHLOROPROPANE (TRIMETHYLENECHLOROBROMIDE)	VEL.
BROMOETHANE (ETHYL BROMIDE)	DOW, GTL, VEL.
1-BROMO-OCTADECANE	DUP, HMY.
1-BROMOPENTANE	HMY.
BROMOTRICHLOROMETHANE	VEL.
DIBROMOETHANE	DOW.
1,1,2,2-TETRABROMOETHANE	DOW.
BROMINATED (INCLUDING BROMOCHLORINATED) HYDROCARBONS, ALL OTHER	GTL, HMY, VEL.
CHLORINATED (NOT OTHERWISE HALOGENATED) HYDROCARBONS	
@CARBON TETRACHLORIDE	ACS, DA, DOW, DUP, FMB, PRO, SPI, TNA(E).
@CHLORINATED PARAFFINS (C10-C30):	
CHLORINATED PARAFFINS, LESS THAN 35% CHLORINE	HK.
@CHLORINATED PARAFFINS, 35-64% CHLORINE	CCH, DA, DVC, FER, ICI, NEV.
CHLORINATED PARAFFINS, 65% OR MORE CHLORINE	DA, DVC, NEV.
1-CHLOROBUTANE	PUB(E), UCC.
@CHLOROETHANE (ETHYL CHLORIDE)	AME, DOW, DUP, PPG, SHC, TNA(E).
@CHLOROFORM	ACS, DA, DOW, PRO, SPI.
@CHLOROMETHANE (METHYL CHLORIDE)	ACS, CO, DCC, DOW, DUP, SPI, TNA(E), UCC.
1-CHLORO-3-METHYL-2-BUTENE	RDA.
3-CHLORO-2-METHYL-1-PROPENE (METHALLYL CHLORIDE)	PMP(E).
3-CHLOROPROPENE	DOW, SHC.
2,2-DICHLOROACETYL CHLORIDE	RDA.
DICHLOROBUTADIENE	DUP.
1,4-DICHLOROBUTENE	DUP, PTT.
@1,2-DICHLOROETHANE (ETHYLENE DICHLORIDE	ACS, AME, BAS, BFG, CO, DA, DOW, FRO, OMC, PPG, SHC, TNA(E), UCC.
@DICHLOROMETHANE (METHYLENE CHLORIDE)	ACS, DA, DOW, PRO, SPI.
@1,2-DICHLOROPROPANE	BAS, DOW, JCC, OMC.
2,3-DICHLOROPROPENE	DOW.
1,1,2,2-TETRACHLOROETHANE (ACETYLENE TETRACHLORIDE)	HK.
@TETRACHLOROETHYLENE (PERCHLOROETHYLENE)	DA, DOW, DUP, PRO, HK, PPG, SPI, TNA(E). PRO.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
@HALOGENATED HYDROCARBONS--CONTINUED	
CHLORINATED (NOT OTHERWISE HALOGENATED) HYDROCARBONS--CONTINUED	
1,1,1-TRICHLOROETHANE (METHYL CHLOROFORM)	DOW, FRO, PPG, TNA(E).
1,1,2-TRICHLOROETHANE	DOW.
@TRICHLOROETHYLENE	DA, DOW, HK, PPG, TNA(E).
1,2,3-TRICHLOROPROPANE	DOW, SHC.
1,2,3-TRICHLOROPROPENE	DOW.
@VINYL CHLORIDE, MONOMER	ACS, AME, BFG, CO, DOW, MNO, PPG, SHC, TNA(E).
VINYLIDENE CHLORIDE, MONOMER (1,1-DICHLOROETHYLENE)	DOW.
@CHLORINATED (NOT OTHERWISE HALOGENATED) HYDROCARBONS, ALL OTHER	DUP, TNA(E).
@FLUORINATED (INCLUDING OTHER FLUOROHALOGENATED) HYDROCARBONS:	
2-BROMO-2-CHLORO-1,1,1-TRIFLUOROETHANE	ICI.
BROMOTRIFLUOROMETHANE	DUP.
1-CHLORO-1,1-DIFLUOROETHANE	DUP, PAS.
@CHLORODIFLUOROMETHANE (F-22)	ACS, DUP, KAI, PAS, RCN, UCC.
CHLOROPENTAFLUOROETHANE	DUP.
CHLOROTRIFLUOROETHYLENE	ACS, MMM.
CHLOROTRIFLUOROMETHANE	X.
1,2-DIBROMO-1,1,2,2-TETRAFLUOROETHANE	DUP.
@DICHLORODIFLUOROMETHANE (F-12)	ACS, DUP, KAI, PAS, RCN, UCC.
DICHLOROTETRAFLUOROETHANE	ACS, DUP, PAS.
1,1-DIFLUOROETHANE	ACS, DUP.
DIFLUOROTETRACHLOROETHANE	X.
HEXAFLUOROPROPYLENE,	DUP.
1-IODOPERFLUOROHEXANE	DUP.
TETRAFLUOROETHYLENE, MONOMER	ACS, DUP.
TETRAFLUOROMETHANE	DUP.
@TRICHLOROFLUOROMETHANE (F-11)	ACS, DUP, KAI, PAS, RCN, UCC.
TRICHLOROTRIFLUOROETHANE	ACS, DUP.
VINYL FLUORIDE, MONOMER	X.
VINYLIDENE FLUORIDE, MONOMER	PAS, X.
@FLUORINATED (INCLUDING OTHER FLUOROHALOGENATED) HYDROCARBONS, ALL OTHER	DUP, ICI, PAS.
IODINATED (NOT OTHERWISE HALOGENATED) HYDROCARBONS:	
DIIODOMETHANE	FMT, NTB.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
IODINATED (NOT OTHERWISE HALOGENATED) HYDROCARBONS--CONTINUED	
IODOETHANE	PMT.
IODOFORM	NTB.
IODOMETHANE	RSA.
@OTHER MISCELLANEOUS ACYCLIC CHEMICALS:	
ACETYL PEROXIDE	WTL.
ALUMINUM ISOPROPOXIDE	CHT, KCH.
@2-BUTANONE PEROXIDE	CAD, NOC, WTC, WTL.
TERT-BUTYL HYDROPEROXIDE	CAD, RCI, WTC, WTL.
@TERT-BUTYL PEROXIDE	CAD, NOC, SHC, WTC, WTL.
CADMIUM BENZOATE	SYP(E).
@CARBON DISULFIDE	ACS, FMB, PAS, PPG, SPI.
2-CHLOROETHANOL	UCC.
DECANOYL PEROXIDE	WTC, WTL.
2,3-DIBROMOPROPANOL	GTL, VEL.
2,5-DIMETHYL-2,5-BIS(2-ETHYL-1-HEXANOYL PEROXY) HEXANE	WTC.
2,5-DIMETHYL-2,5-DI(TERT-BUTYLPEROXY)HEXANE	WTL.
2,5-DIMETHYL-2,5-DI(TERT-BUTYLPEROXY)HEXYNE-3	WTL.
@EPOXIDES, ETHERS, AND ACETALS:	
1-(ALLYLOXY)-2,3-EPOXYPROPANE (ALLYL GLYCIDYL ETHER)	AAC.
BIS(2-CHLOROETHOXY)METHANE	TKL.
BIS(2-CHLOROETHYL)ETHER	DOW.
BIS(2-CHLORO-1-METHYLETHYL)ETHER (DICHLOROISOPROPYL ETHER)	DOW.
BUTYLENE OXIDE	DOW.
BUTYL VINYL ETHER	GAF, PUB(E).
2-CHLOROETHYL VINYL ETHER	AAC.
CHLOROMETHYL METHYL ETHER	RH.
2,2-DICHLORO-1,1-DIFLUOROETHYL METHYL ETHER	DOW.
DIMERCAPTODIETHYL ETHER	EVN.
EPICHLOROHYDRIN	DOW, SHC.
@ETHYLENE OXIDE	BAS, CAU, CEL, DOW, EKX, JCC, NWP, OMC, PPG, SHC, SNO, UCC.
ETHYL ETHER, ABSOLUTE	EKX, MAL, USI.
ETHYL ETHER, TECH.	ENJ(E), PUB(E), UCC, USI.
ETHYL ETHER, U.S.P.	MAL, USI.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
OTHER MISCELLANEOUS ACYCLIC CHEMICALS--CONTINUED	
@EPOXIDES, ETHERS, AND ACETALS--CONTINUED	
ETHYL VINYL ETHER	GAF.
GLYCIDOL	DIX.
ISOBUTYL VINYL ETHER	GAF.
ISOPROPYL ETHER	ENJ(E), SHC, UCC.
METHYLAL	CEL.
METHYL VINYL ETHER	GAF.
@PROPYLENE OXIDE	BAS, DOW, JCC, OCC, OMC.
@EPOXIDES, ETHERS, ACETALS, ALL OTHER	DA, GAF, PG, UCC.
FATS AND OILS, CHEMICALLY MODIFIED:	
HYDROGENATED TALLOW GLYCERALDEHYDES	CHL.
STEARIC ACID GLYCERIDES AND OXIDIZED STEARIC ACID GLYCERIDES	SDW.
FATS AND OILS, CHEMICALLY MODIFIED, ALL OTHER	DOM, SDW.
GLUTARALDEHYDE BIS(SODIUM BISULFITE)	EK, FMT.
NORMAL-HEXADECYL DISULFIDE	PAS.
HYDROCARBONS:	
NORMAL-DECANE	HMY, PLC.
2,5-DIMETHYLHEXA-2,4-DIENE	SFS.
NORMAL-DODECANE	HMY.
HEXADECANE	HMY.
MYRCENE	IFF, NCI.
NORMAL-NONANE	PLC.
NORMAL-OCTADECANE	HMY.
NORMAL-OCTANE	HMY, PLC.
HYDROCARBONS, ALL OTHER	CBY, HMY, OCC, UCC.
LAUROYL PEROXIDE	WTC, WTL.
2-MERCAPTOETHANOL	PLC.
METHYL SULFIDE	CRZ, PAS, TCH.
METHYL SULFOXIDE (DIMETHYL SULFOXIDE)	CRZ.
ORGANO-ALUMINUM COMPOUNDS:	
DIETHYLALUMINUM CHLORIDE	TNA(E), TSA.
DIETHYLALUMINUM IODIDE	TSA.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
OTHER MISCELLANEOUS ACYCLIC CHEMICALS--CONTINUED	
ORGANO-ALUMINUM COMPOUNDS--CONTINUED	
DIISOBUTYLALUMINUM CHLORIDE	TNA(E), TSA.
DIISOBUTYLALUMINUM HYDRIDE	TSA.
ETHYLALUMINUM DICHLORIDE	TNA(E), TSA.
ETHYLALUMINUM SESQUICHLORIDE	TNA(E), TSA.
ISOPROPENYLALUMINUM	TSA.
METHYLALUMINUM SESQUICHLORIDE	TNA(E).
SODIUM ALUMINUM CHLOROHYDROXYLACTATE	REH.
SODIUM ALUMINUM HYDROXYLACTATE	REH.
TRIETHYLALUMINUM	TNA(E), TSA.
TRIISOBUTYLALUMINUM	TNA(E), TSA.
ORGANO-ALUMINUM COMPOUNDS, ALL OTHER	TSA.
ORGANO-BORON COMPOUNDS:	
BORON FLUORIDE - ETHYL ETHER COMPLEX	ACS.
ORGANO-BORON COMPOUNDS, ALL OTHER	ACS, APO, TSA.
ORGANO-LITHIUM COMPOUNDS:	
NORMAL-BUTYLLITHIUM	PTE.
SEC-BUTYLLITHIUM	PTE.
ORGANO-LITHIUM COMPOUNDS, ALL OTHER	UCC.
@ORGANO-SILICON COMPOUNDS:	
DICHLOROMETHYLVINYLSILANE	UCC.
DIETHOXYPHOSPHORYLETHYLTRIETHOXYSILANE	SPS, UCC.
ALPHA-GLYCIDOXYPROPYLTRIMETHOXYSILANE	UCC.
MERCAPTOPROPYLTRIMETHOXYSILANE	UCC.
ALPHA-METHACRYLOXYPROPYLTRIMETHOXYSILANE	UCC.
METHYLTRIMETHOXYSILANE AND POLYMETHYLTRISILOXANE	UCC.
POLYOXYALKENE SILICONES	UCC.
SILICONE FLUIDS	SPD, SWS, UCC.
TRICHLOROMETHYLSILANE	DCC.
TRICHLOROPROPYLSILANE	DCC.
TRICHLOROVINYLSILANE	DCC, UCC.
VINYLTRIETHOXYSILANE	UCC.
ORGANO-SILICONE COMPOUNDS, ALL OTHER	UCC.
ORGANO-TIN COMPOUNDS:	
BIS(TRIBUTYLTIN)OXIDE	X.
DIBUTYLTIN BIS(ISOOCTYLMERCAPTOACETATE)	CCW, X.
DIBUTYLTIN DICHLORIDE	CCW, X.

TABLE 2.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE EITHER REPORTED OR ESTIMATED, IDENTIFIED BY MANUFACTURER, 1976--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
OTHER MISCELLANEOUS ACYCLIC CHEMICALS--CONTINUED	
ORGANO-TIN COMPOUNDS--CONTINUED	
DIBUTYLTIN METHOXIDE (DIBUTYLMETHOXYTIN)	CCA.
DIBUTYLTIN OXIDE	X.
TRIBUTYLTIN CHLORIDE	MET.
TRIBUTYLTIN FLUORIDE	MET.
ORGANO-TIN COMPOUNDS, ALL OTHER	APO, CCA, CCW, MET, X.
ORGANO-ZINC COMPOUNDS:	
DIETHYLZINC	TSA.
PERCHLOROMETHANETHIOL	SFA, SFC.
PERFLUOROALKYL POLYETHER	SYP(E), X.
@PHOSGENE (CARBONYL CHLORIDE)	ACS, CTN, DUP, MOB(E), OMC, OTC(E), PPG, RUC, UCC, UPJ.
PINE OIL, SYNTHETIC	CBY, NCI.
PROPANONE PEROXIDE	GLD.
SODIUM ETHOXIDE	FMP(E).
SODIUM FORMALDEHYDE BISULFITE	EK, WAY.
SODIUM FORMALDEHYDE SULFOXYLATE	DA.
@SODIUM METHOXIDE	DA, HSH, OMC, RBC.
SUCCINYL PEROXIDE	WTL.
TETRAKIS(HYDROXYMETHYL)PHOSPHONIUM CHLORIDE	X.
ZINC FORMALDEHYDE SULFOXYLATE	USO.
@MISCELLANEOUS ACYLIC CHEMICALS, ALL OTHER	ALD, ARA, BKL, CCL, DA, DAN, EK, GAF, GLY, GNM, IMC, MET, NCI, PVO, SFS, SHC, SM, UCC, VTC, WAY, WLN, WTL.
MIXTURES NOT SPECIFICALLY ITEMIZED (SPECIFY):	
POLYMETHACRYLIC ACID ESTERS	DUP.
MIXTURES OF MISCELLANEOUS ACYCLIC CHEMICALS NOT SPECIFICALLY ITEMIZED	ALX, CCL, CEL, DUP, EKX, HPC, ICI, MCI, MLS, PG, PLC, PMP, PVO, S, SCP, SM, TKL, VEL, WM, WTH

TABLE 3.--Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, 1976

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production or sales of miscellaneous cyclic and acyclic chemicals to the U.S. International Trade Commission for 1976 are listed below in the order of their identification codes as used in table 2]

Code	Name of company
AAC	Alcolac Chemical Corp.
ABB	Abbott Laboratories
	Allied Chemical Corp.:
ACS	Specialty Chemicals Div.
ACY	American Cyanamid Co.
ADC	Anderson Development Co.
AIP	Air Products & Chemicals, Inc.
AKS	Arkansas Co., Inc.
ALB	Ames Laboratories, Inc.
ALD	Aldrich Chemical Co., Inc.
ALF	Allied Chemical Corp., Fibers Div.
ALX	Alox Corp.
AME	Stauffer Chemical Co.
ARA	Arapahoe Chemicals, Inc. Sub/Syntex Corp. (U.S.A)
ARC	Armak Co.
ARM	USS Agri-Chemicals Div. of U. S. Steel Corp.
ARS	Arsynco, Inc.
ARZ	Arizona Chemical Co.
ASH	Ashland Oil, Inc., Ashland Chemical Co.
ASL	Ansul Chemical Co.
AV	Avtex Fibers, Inc.
AZT	Dart Industries, Inc., Aztec Chemicals Div.
BAS	BASF Wyandotte Corp.
BAX	Baxter Laboratories, Inc.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Co. Div.
BKC	J. T. Baker Chemical Co.
BKL	Kewanee Industries, Inc., Millmaster Chemical Co. Div.
BME	Bendix Corp., FMD Div.
BOR	Borden Co., Borden Chemical Div.
BRD	Lonza, Inc.
BUK	Buckeye Cellulose Corp.
CAD	Noury Chemical Corp.
CAU	Calcasieu Chemical Corp.
CBD	Chembond Corp.
CBY	Crosby Chemicals, Inc.
CCA	Interstab Chemical, Inc.
CCH	Pearsall Chemical Corp.
CCL	Catawba-Charlab, Inc., Polymer Specialties Co.
CCW	Cincinnati Milacron Chemicals, Inc.
CDY	Chemical Dynamics Corp.
CEL	Celanese Corp.:
	Celanese Chemical Co.
	Celanese Fibers Co.
	Celanese Polymer Specialties Co.
CGY	Ciba-Geigy Corp. and Pharmaceutical Div.
CHL	Chemol, Inc.
CHN	N-Ren Corp., Cherokee Nitrogen Div.
CHP	C. H. Patrick & Co., Inc.
CHT	Chattem Drug & Chemical Co., Chattem Chemicals Div.
CLK	Clark Chemical Corp.
CLN	Standard Brands, Inc., Clinton Corp.
CNP	Nipro Inc.
CO	Continental Oil Co.
COL	Collier Carbon & Chemical Corp.
CP	Colgate-Palmolive Co.
CPS	CPS Chemical Co.
CPV	Cook Paint & Varnish Co., Inc.
CRN	CPC International, Inc., Amerchol
CRZ	Crown Zellerbach Corp., Chemical Products Div.
CTN	Chemetron Corp., Chemical Products Div.
CWN	Upjohn Co., Fine Chemical Div.
DA	Diamond Shamrock Corp.
DAN	Dan River, Inc.
DBC	Dow Badische Co.
DCC	Dow Corning Corp.
DIX	Dixie Chemical Co.
DOM	Dominion Products, Inc.
DOW	Dow Chemical Co.
DUP	E. I. DuPont de Nemours & Co., Inc.
DVC	Dover Chemical Corp. Sub. of ICC Industries, Inc.
EFH	E. F. Houghton & Co.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
EKX	Texas Eastman Co. Div.
ELP	El Paso Products Co.
EMR	Emery Industries, Inc.
ENJ	Exxon Chemical Co. U.S.A.
EVN	Evans Chemetics, Inc.
EW	Westinghouse Electric Corp.
FCA	Farmers Chemical Association, Inc.
FER	Ferro Corp.:
	Ferro Chemical Div.
	Grant Chemical Div.
	Keil Chemical Div.
FIN	Hexcel Corp., Fine Organics Div.
	FMC Corp.:
FMB	Industrial Chemical Div.
FMP	Industrial Chemical Div.
FMT	Fairmount Chemical Co., Inc.
FOC	Handschy Chemical Co., Farac Oil & Chemical Div.
FRO	Vulcan Materials Co., Chemicals Div.
FTE	Foote Mineral Co.
FTX	CF Industries, Inc.
GAF	GAF Corp., Chemical Div.
GAN	Gane's Chemical Works, Inc.
GIV	Givaudan Corp.
GLD	SCM Corp., Glidden-Durkee Div.
GLY	Glyco Chemicals, Inc.
GNM	General Mills Chemicals, Inc.
GOC	Gulf Oil Corp., Gulf Oil Chemicals Co.-U.S.
GP	Georgia-Pacific Corp.:
	Rebecca Plant
	Resins Operations

TABLE 3.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: DIRECTORY OF MANUFACTURERS, 1976--CONTINUED

Code	Name of company
GPR	Grain Processing Corp.
GRD	W. R. Grace & Co., Polymers & Chemicals Div.
GRH	W. R. Grace & Co., Hatco Chemical Div.
GTL	Great Lakes Chemical Corp.
GYR	Goodyear Tire & Rubber Co.
HAL	C.P. Hall Co.
HDG	Hodag Chemical Corp.
HEX	Hexagon Laboratories, Inc.
HFT	Syntex Agribusiness, Inc.
HK	Hooker Chemicals & Plastic Corp.:
HKD	Durez Div.
HMP	W. R. Grace & Co., Organic Chemicals Div.
HMY	Humphrey Chemical Co.
HN	Tenneco Chemicals, Inc.
HPC	Hercules, Inc.
HRT	Hart Products Corp.
HSH	Harshaw Chemical Co. Div. of Kewanee Oil Co.
HUM	Kraft, Inc., Humko Products Chemical Div.
ICI	ICI United States, Inc., Specialty Chemical Group
IFF	International Flavor & Fragrances, Inc.
IMC	IMC Chemical Group, Inc., Nitroparaffin Div.
IOC	Ionac Chemical Co. Div. of Sybron Corp.
JCC	Jefferson Chemical Co., Inc.
KAI	Kaiser Aluminum & Chemical Corp., Kaiser Chemicals Div.
KCC	Kennecott Copper Corp., Chino Mines Div.
KCH	Joseph Ayers, Inc.
KF	Kay-Fries Chemicals, Inc.
KPT	Koppers Co., Inc., Organic Materials Div.
LEM	Napp Chemicals, Inc.
LIL	Eli Lilly & Co., Inc.
MAL	Mallinckrodt Chemical Works
MCB	Borg-Warner Corp., Weston Chemical Co.
MCI	Mooney Chemicals, Inc.
MHI	Ventron Corp.
MIL	Milliken & Co., Milliken Chemical Div.
MLS	Miles Laboratories, Inc., Marschall Div.
MMM	Minnesota Mining & Manufacturing Co.
MNO	Monochem, Inc.
MNR	Monroe Chemical
MOB	Mobay Chemical Co.
MON	Monsanto Co.
MRK	Merck & Co., Inc.
MRV	Marlowe-Van Loan Corp.
MTO	Montrose Chemical Corp. of California
NCI	Union Camp Corp.
NEO	Norda, Inc.
NES	Nease Chemical Co., Inc.
NEV	Neville Chemical Co.
NLC	Nalco Chemical Co.
NOC	Norac Co., Inc. and Mathe Chemical Co. Div.
NOR	Norwich Pharmacal Co.
NPI	Stephan Chemical Co., Polychem Dept.
NSC	National Starch & Chemical Corp.
NTB	National Biochemical Co.
NTL	NL Industries, Inc.
NWP	Northern Petrochemicals Co.
OCC	Oxirane Chemical Co.
OH	Airco, Inc., Ohio Medical Products Div.
OMC	Olin Corp.
OMS	E. R. Squibb & Sons, Inc.
ONX	Millmaster Onyx Corp., Onyx Chemical Co.
ORO	Chevron Chemical Co.
ORT	Roehr Chemicals, Inc.
OTC	Story Chemical Corp.
PAS	Pennwalt Corp.
PCW	Pfister Chemical Works
PD	Parke, Davis & Co. Sub of Warner-Lambert Co.
PEN	CPC International, Inc., S. B. Penick Div.
PFN	Pfanstiehl Laboratories, Inc.
PFX	Plastifax, Inc.
PFZ	Pfizer, Inc. & Pfizer Pharmaceuticals, Inc.
PG	Procter & Gamble Co.
PIC	Pierce Chemical, Inc.
PLC	Phillips Petroleum Co.
PLS	Plastics Engineering Co.
PMP	Premier Malt Products, Inc.
PNA	Pan American Chemical Corp.
PPG	Pittsburgh Plate Glass Co.
PRD	Ferro Corp., Productol Chemical Div.
PTT	Petro-Tex Chemical
PUB	Publicker Industries, Inc.
PVO	PVO International, Inc.
QCP	Quaker Chemical Corp.
QKO	Quaker Oats Co.
RBC	Fike Chemicals, Inc.
RCI	Reichhold Chemicals, Inc.
RCN	Racon, Inc.
RDA	Rhodia, Inc.
REH	Reheis Chemical Co. Div. of Armour Pharmaceutical Co.
REM	Remington Arms Co., Inc.
RH	Rohm & Haas Co.
RSA	R.S.A. Corp.
RUB	Hooker Chemical Corp., Ruco Div.
RUC	Rubicon Chemicals, Inc.
S	Sandoz, Inc.
SAL	Salsbury Laboratories
SAR	Sartomer Industries, Inc.
SBC	Scher Bros.
SCP	Henkel, Inc.
SDC	Martin-Marietta Corp., Sodeyco Div.
	Sterling Drug, Inc.:
SDH	Hilton-Davis Chemical Co. Div.
SDW	Winthrop Laboratories Div.
	Stauffer Chemical Co.:
SFA	Agricultural Div.
SFC	Calhio Chemicals, Inc. Div.
SFI	Industrial Div.
SFP	Plastics Div.
SFS	Specialty Chemical Div.
SHC	Shell Oil Co., Shell Chemical Co. Div.
SHP	Shepherd Chemical Co.
SK	Smith & Kline Chemicals
SKO	Getty Refining & Marketing Co.
SM	Mobil Oil Corp., Chemical Co.:
	Chemical Coatings Div.
	Phosphorus Div.

TABLE 3.--Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, 1976--Continued

Code	Name of company	Code	Name of company
SNO	SunOlin Chemical Co.	UCC	Union Carbide Corp.
SNW	Sun Chemical Corp., Chemical Div.	UOP	UOP, Inc., UOP Chemical Div.
SOC	Standard Oil Co. of California, Chevron Chemical Co.	UPJ	Upjohn Co.
		UPM	UOP, Inc.
SOH	Vistron Corp.	USB	U.S. Borax Research Corp.
SPD	General Electric Co., Silicone Products Dept.	USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co.
STC	American Hoechst Corp., Sou-Tex Works	USO	U.S. Oil Company
STP	Stepan Chemical Co.	USR	Uniroyal, Inc., Chemical Div.
SW	Sherwin-Williams Co.	USS	USS Chemicals Div. of U.S. Steel Corp.
SWS	Stauffer Chemical Co., SWS Silicones Div.	VAL	Valchem
SYP	Dart Industries, Inc., Synthetic Products Co. Div.	VEL	Velsicol Chemical Corp., Inc.
		VGC	Virginia Chemicals, Inc.
		VND	Van Dyk & Co., Inc.
TCH	Emery Industries Inc., Trylon Div.	VTC	Vicksburg Chemical Co. Div. of Vertac Consolidated
TID	Getty Refining & Marketing Co., Delaware Refinery		
TKL	Thiokol Chemical Corp.	WAY	Phillip A. Hunt Chemical Corp., Organic Chemical Div.
TNA	Ethyl Corp.		
TNI	The Gillette Co., Chemical Div.	WLN	Wilmington Chemical Corp.
TRO	Troy Chemical Corp.	WM	Inolex Corp.
TSA	Texas Alkyls, Inc.	WTC	Witco Chemical Co., Inc.
TX	Texaco, Inc.	WTH	Union Camp Corp., Chemical Div., Dover Plant
TZC	Magnesium Elektron, Inc.	WTL	Pennwalt Corp., Lucidal Div.
		WYC	Wycon Chemical Co.

Note.--Complete names and addresses of the above reporting companies are listed in table 1 of the Appendix.

APPENDIX

APPENDIX

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976

[Names of synthetic organic chemical manufacturers that reported production or sales to the U.S. International Trade Commission for 1976 are listed below alphabetically, together with their identification codes as used in table 2 of the 15 individual sections of this report]

Identi-fication code	Name of company	Office address
AEP	A & E Plastik Pak Co., Inc	14505 E. Proctor Ave., Industry, CA 91749.
AZS	AZS Corp.	762 Marietta Blvd., Atlanta, GA 30318.
	AZ Products Co. Div	2525 So. Combee Rd., Eaton Park, FL 33840.
ABB	Abbott Laboratories	14th St. and Sheridan Rd., N. Chicago, IL 60064.
ABS	Abex Corp., Friction Products Group	P. O. Box 3207, Winchester, VA 22601.
WLC	Agrico Chemical Co	P. O. Box 3166, Tulsa, OK 74101.
AGY	Agway, Inc., Olean Nitrogen Div	1446 Buffalo St., Olean, NY 14760.
OH	Airco, Inc., Ohio Medical Products Div	3030 Airco Dr., Madison, WI 53701.
AIP	Air Products & Chemicals, Inc., Chemicals Group.	636 E. Swedesford Rd., #5 Executive Mall, Wayne, PA 19187.
ALC	Alco Chemical Corp	Trenton Ave. and William St., Philadelphia, PA 19134.
AAC	Alcolac, Inc	3440 Fairfield Rd., Baltimore, MD 21236.
ALD	Aldrich Chemical Co., Inc	940 W. St. Paul Ave., Milwaukee, WI 53233.
ALL	Alliance Chemical Co., Inc	33 Avenue P, Newark, NJ 07105.
	Allied Chemical Corp.:	
ACN	Agricultural Div	P. O. Box 2120, Houston, TX 77001.
ALF	Fibers Div	1411 Broadway - 38th Fl., New York, NY 10018.
ASC	Semet-Solvay Div	Columbia Rd., Morristown, NJ 07960.
ACS	Specialty Chemicals Div	P. O. Box 1219 R, Morristown, NJ 07960.
ACU	Union Texas Petroleum Div	P. O. Box 2120, Houston, TX 77001.
ALX	Alox Corp	3943 Buffalo Ave., Niagara Falls, NY 14303.
APH	Alpha Chemical Corp	Highway 57 East, Collierville, TN 38017.
ALP	Alpha Laboratories, Inc	1685 S. Fairfax St., Denver, CO 80222.
AMC	Amchem Products, Inc. Div. of Rorer-Amchem, Inc.	Brookside Ave. and Spring Garden St., Ambler, PA 19002.
HES	Amerada Hess Corp. (Hess Oil Virgin Islands Corp.)	1 Hess Plaza, Woodridge, NJ 07095.
AMB	American Bio-Synthetics Corp	710 W. National Ave., Milwaukee, WI 53204.
MAR	American Can Co., Wood Chemical Div	American Lane, Greenwich, CT 06830.
AC	American Color & Chemical Corp	P. O. Box 51, Reading, PA 19603.
ACY	American Cyanamid Co	Wayne, NJ 07470.
	American Hoechst Corp.:	
HST	Hoechst Fibers Industries Div	Route 202-206 North, Somerville, NJ 08876.
HST	Rhode Island Works	129 Quidnick St., Coventry, RI 02816.
STC	Sou-Tex Works	P. O. Box 866, E. Catawba Ave., Mount Holly, NC 28120.
APF	American Petrofina Co. of Texas	P. O. Box 849, Port Arthur, TX 77604.
ASY	American Synthetic Rubber Corp	P. O. Box 32960, 4500 Camp Ground Rd., Louisville, KY 40232.
ALB	Ames Laboratories, Inc	200 Rock Lane, Milford, CT 06460.
ACC	Amoco Chemicals Corp	200 E. Randolph Dr., Chicago, IL 60680.
AMO	Amoco Oil Company	200 E. Randolph Dr., Chicago, IL 60680.
PAN	Amoco Production Co	P. O. Box 591, Tulsa, OK 74102.
AMO	Amoco Texas Refining Co	200 E. Randolph Dr., Chicago, IL 60680.
ADC	Anderson Development Co	1415 E. Michigan St., Adrian, MI 49221.
ASL	Ansul Chemical Co	1 Stanton St., Marinette, WI 54143.
APX	Apex Chemical Co., Inc	200 S. 1st St., Elizabethport, NJ 07206.
APO	Apollo Colors, Inc	899 Skokie Blvd., Northbrook, IL 60062.
ARA	Arapahoe Chemicals, Inc. Sub/Syntex Corp. (U.S.A.).	2075 Walnut St., Boulder, CO 80302.
KPP	ARCO/Polymers, Inc	1500 Market St., Philadelphia, PA 19101.
ARD	Ardmore Chemical Co., Inc	840 Valley Brook Ave., Lyndhurst, NJ 07071.
ARN	Arenol Chemical Corp	40-33 23d St., Long Island City, NY 11101.
ARZ	Arizona Chemical Co	Berdan Ave., Wayne, NJ 07470.
AKS	Arkansas Co., Inc	185 Foundry St., Newark, NJ 07101.
ARC	Armak Co	300 S. Wacker Dr., Chicago, IL 60606.
AGP	Armour-Dial Co	2000 Aucutt Rd., Montgomery, IL 60538.
ARP	Armour Pharmaceutical Co	111 W. Clarendon Ave., Phoenix, AZ 85077.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identi-fication code	Name of company	Office address
ARK	Armstrong Cork Co	Charlotte & Liberty Sts., Lancaster, PA 17604.
ARL	Arol Chemical Products Co	649 Ferry St., Newark, NJ 07105.
ARS	Arsynco, Inc	P. O. Box 8, Carlstadt, NJ 07072.
ASH	Ashland Oil, Inc	1401 Winchester Ave., Ashland, KY 41101 and P. O. Box 2458, Columbus, OH 43216.
	Ashland Chemical Co	P. O. Box 2219, Columbus, OH 43216.
BLA	Astor Products, Inc., Blue Arrow Div	P. O. Box 2366, Jacksonville, FL 32203.
AST	Astra Pharmaceutical Products, Inc	P. O. Box 1089, Pleasant St. Connector, Farmingham, MA 01701.
ATL	Atlantic Chemical Corp	10 Kingsland Rd., Nutley, NJ 07110.
ATR	Atlantic Richfield Co	P. O. Box 2679-T.A., Los Angeles, CA 90071.
APD	Atlas Powder Co. Sub. of Tyler Corp	P. O. Box 87, Joplin, MO 64801.
APR	Atlas Processing Co	P. O. Box 9389, 3546 Midway St., Shreveport, LA 71109.
AV	Avtex Fibers, Inc	P. O. Box 880, Executive Mall, Bldg. 9, Valley Forge, PA 19482.
KCH	Joseph Ayers, Inc	Route #2, Bethlehem, PA 18017.
BAS	BASF Wyandotte Corp	100 Cherry Hill Rd., Parsippany, NJ 07054.
BRP	BP Oil, Inc	270 Midland Bldg., Cleveland, OH 44115.
BKC	J. T. Baker Chemical Co	222 Red School Lane, Phillipsburg NJ 08865.
BAL	Baltimore Paint & Chemical Corp	2325 Hollins Ferry Rd., Baltimore, MD 21230.
BAX	Baxter Laboratories, Inc	6301 N. Lincoln Ave., Morton Grove, IL 60053.
BAO	Bayoil Co., Inc	2 Union St., Peabody, MA 01960.
BEE	Beecham, Inc	65 Industrial S., Clifton, NJ 07012.
BIC	Beker Industries, Inc	Carlsvad, NM 88220.
BCM	Belding Chemical Industries	1430 Broadway, New York, NY 10018.
BME	Bendix Corp., FMD Div	P. O. Box 238, Troy, NY 12180.
BEN	Bennett's	65 W. 1st St., Salt Lake City, UT 84110.
BDO	Benzenoid Organics, Inc	P. O. Box 157, Route 140, Bellingham, MA 02019.
PDC	Berncolors-Poughkeepsie, Inc	75 N. Water St., Poughkeepsie, NY 12602.
BNS	Binney and Smith, Inc	P. O. Box 431, 1100 Church Lane, Easton, PA 18042.
BOC	Biocraft Laboratories, Inc	12 Industrial Way, Waldwick NJ 07463.
BOR	Borden, Inc.:	
	Borden Chemical Div	180 E. Broad St., Columbus, OH 43215.
	Printing Ink Div	630 Glendale-Milford Rd., Cincinnati, OH 45215.
MCB	Borg-Warner Corp.:	
	Borg-Warner Chemicals	International Centsr, Parkersburg, WV 26101.
	Weston Chemical Div	103 Spring Valley Rd., Montvale, NJ 07645.
MRA	Bostik South, Inc. Sub of USM Corp	P. O. Box 5695, Greenville, SC 29606.
BFP	Breddo Food Products Co., Inc	18th and Kansas Avenue, Kansas City, KS 66105.
BRS	Bristol-Meyers Co., Bristol Laboratories Div.	P. O. Box 657, Syracuse, NY 13201.
BRU	M. A. Bruder & Sons, Inc	52d St. and Grays Ave., Philadelphia, PA 19143.
BUK	Buckeye Cellulose Corp	2899 Jackson Ave., Memphis, TN 38108.
BKM	Buckman Laboratories, Inc	1256 N. McLean Blvd., Memphis, TN 38108.
BJL	Burdick & Jackson Laboratories, Inc	1953 S. Harvey St., Muskegon, MI 49442.
BUR	Burroughs Wellcome Co	3030 Cornwallis Rd., Research Triangle Park, NC 27709.
FTX	CF Industries, Inc	Salem Lake Dr., Long Grove, IL 60047
	CPC International, Inc.:	
ACR	Acme Resin Co. Div	1401 S. Circle Avenue, Forest Park, IL 60130.
CRN	Amerchol	Talmadge Rd., Edison, NJ 08817.
PEN	S. B. Penick Co	1050 Wall St. W., Lyndhurst, NJ 07071.
CPS	CPS Chemical Co	P. O. Box 162, Old Bridge, NJ 08857.
CBT	Samuel Cabot, Inc	One Union St., Boston, MA 02108.
CAU	Calcasieu Chemical Corp	P. O. Box 1522, Lake Charles, LA 70601.
CBM	Carborundum Co	P. O. Box 477, Niagara Falls, NY 14302.
CGL	Cargill, Inc	P. O. Box 9300, Minneapolis, MN 55402.
GOR	Carl Gordon Industries, Inc	1001 Southbridge St., Worcester, MA 01610.
ZGL	Carolina Processing Corp	P.O. Box 161, Severn, NC 27877.
JWC	J.W. Carroll & Sons Div. of U.S. Industries, Inc.	22600 S. Bonita St., Carson, CA 90745.
CRS	Carus Chemical Co	1500 8th St., LaSalle, IL 61301.

APPENDIX

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identification code	Name of company	Office address
DOL	Castle & Cooke, Inc., Castle & Cooke Foods, Hawaii Pineapple Div.	650 Iwilei Rd., Honolulu, HI 96817.
CCL	Catawba-Charlab, Inc	P. O. Box 948, Charlotte, NC 28231.
CEL	Celanese Corp.:	
	Celanese Chemical Co	1211 Avenue of the Americas, New York, NY 10036.
	Celanese Coatings & Specialties Co., Wica Plant.	P. O. Box 1863, Louisville, KY 40201.
	Celanese Fibers Co	P. O. Box 1414, Charlotte, NC 28201.
	Celanese Plastics Co	26 Main St., Chatham, NJ 07928.
	Celanese Polymer Specialties Co	One Riverfront Plaza, Louisville, KY 40202.
CNT	CertainTeed Corp	P. O. Box 860, Valley Forge, PA 19482.
CPR	Certified Processing Corp	U.S. Highway 22, Hillside, NJ 07205.
CRS	Champlin Petroleum Co	P. O. Box 9176, Corpus Christi, TX 78408.
SOC	Charter International Oil Co	P. O. Box 5008, Houston, TX 77012.
CHT	Chattem Drug & Chemical Co., Chattem Chemicals Div.	1715 W. 38th St., Chattanooga, TN 37409.
CBD	Chembond Corp	P. O. Box 270, Springfield, OR 97404.
	Chemed Corp.:	
GRC	Dubois Chemicals Div	Dubois Tower, Cincinnati, OH 45202.
GRL	Vestal Laboratories Div	4963 Manchester Ave., St. Louis, MO 63110.
	Chemetron Corp.:	
CTN	Chemical Products Div	P. O. 66251-AMF O'Hare, Chicago, IL 60666.
HSC	Pigments Div	491 Columbia Ave., Holland, MI 49423.
CI	Chem-Fleur, Inc	200 Pulaski St., Newark, NJ 07105.
CDY	Chemical Dynamics Corp	P. O. Box 395, 3001 Hadley Rd., S. Plainfield, NJ 07080.
CHF	Chemical Formulators, Inc	P. O. Box 26, Nitro, WV 25143.
CHL	Chemol, Inc	P. O. Box 20687, Greensboro, NC 27420.
CPX	Chemplex Co	3100 Golf Rd., Rolling Meadows, IL 60008.
ORO	Chevron Chemical Co	575 Market St., San Francisco, CA 94105.
CHC	Choate Chemical Co	P. O. Box 27205, Richmond, VA 23261.
CHH	CHR. Hansen's Laboratory, Inc	9015 W. Maple St., West Allis, WI 53214.
CGY	Ciba-Geigy Corp	444 Saw Mill River Rd., Ardsley, NY 19502.
	Agricultural Div	P. O. Box 11422, Greensboro, NC 27409.
	Pharmaceutical Div	556 Morris Ave., Summit NJ 07901.
	Resins Dept	444 Saw Mill River Rd., Ardsley, NY 10502.
CCW	Cincinnati Milacron Chemicals, Inc	West St., Reading, OH 45215.
CIN	Cindet Chemicals, Inc	2408 Doyle St., Greensboro, NC 27420.
CSO	Cities Service Co	P. O. Box 1562, Lake Charles, LA 70602.
CBN	Columbian Div	P. O. Box 300, Tulsa, OK 74102.
TEN	Copperhill Operations	Copperhill, TN 37317.
CBN	Petrochemicals Div	6th & Boston Sts., Tulsa, OK 74102.
CBN	Petrochemical	P. O. Box 1522, Lake Charles, LA 70602.
CLK	Clark Chemical Corp	131st St. & Kedzie Ave., Blue Island, IL 60406.
CLY	W. A. Cleary Corp	P. O. Box 10, Somerset, NJ 08873.
CLI	Clintwood Chemical Co	4342 S. Wolcott Ave., Chicago, IL 60609.
CSP	Coastal States Petrochemical Co	P. O. Drawer 521, Corpus Christi, TX 78403.
CP	Colgate-Palmolive Co	300 Park Ave., New York, NY 10022.
COL	Collier Carbon & Chemical Corp	P. O. Box 60455, Los Angeles, CA 90060.
CLD	Colloids, Inc	394 Prelinghuysen Ave., Newark, NJ 07114.
CNC	Columbia Nitrogen Corp	P. O. Box 1483, Augusta, GA 30903.
CMP	Commercial Products Co., Inc	117 Ethel Ave., Hawthorne, NJ 07506.
COR	Commonwealth Oil Refining Co., Inc	Petrochemical Complex, Ponce, PR 00731.
CPI	Commonwealth Petrochemicals, Inc	Petrochemical Complex, Ponce, PR 00731.
CNI	Conap, Inc	1405 Buffalo St., Olean, NY 14760.
CNE	Conchemco, Inc	1000 Marshall Dr., Lenexa, KS 66215.
SED	Colony Paint Div	18th & Garfield Sts., Kansas City, MO 64127.
CON	Concord Chemical Co., Inc	17th & Federal Sts., Camden, NJ 08105.
CWP	Consolidated Papers, Inc	231 1st Ave N., Wisconsin Rapids, WI 54494.
CTL	Continental Chemical Co	270 Clifton Blvd., Clifton, NJ 07015.
CO	Continental Oil Co	P. O. Box 1267, 1000 South Pine, Ponca City, OK 74601.
CPV	Cook Paint & Varnish Co	P. O. Box 389, Kansas City, MO 64141.
CFA	Cooperative Farm Chemicals Association	P. O. Box 308, Lawrence, KS 66044.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identi-fication code	Name of company	Office address
COP	Coopers Creek Chemical Corp	River Rd., W. Conshohocken, PA 19428.
CPY	Copolymer Rubber & Chemical Corp	P. O. Box 2591, Baton Rouge, LA 70821.
SWC	Corco Cyclohexane, Inc	Petrochemical Complex, Ponce, PR 00731.
CSD	Cosden Oil & Chemical Co	P. O. Box 1311, Big Spring, TX 79720.
CRT	Crest Chemical Corp	225 Emmet St., Newark, NJ 07114.
CRD	Croda, Inc	51 Madison Ave., Suite 2518, New York, NY 10010.
ALT	Crompton & Knowles Corp	500 Pear St., Reading, PA 19603.
CBY	Crosby Chemicals, Inc	P. O. Box 460, Picayune, MS 39466.
CCP	Crown Central Petroleum Corp	1 N. Charles St., Baltimore, MD 21203.
CRZ	Crown Zellerbach Corp., Chemical Products Div.	Camas, WA 98607.
CTR	Customs Resins, Inc	P. O. Box 933, Henderson KY 42420.
DAN	Dan River, Inc	P. O. Box 261, Danville, VA 24541.
	Dart Industries, Inc.:	
AZT	Aztec Chemicals Div	555 Garden St., Elyria, OH 44035.
SYP	Synthetic Products Co. Div	1636 Wayside Rd., Cleveland, OH 44112.
DYS	Davies-Young Co	2700 Wagner Place, Maryland Heights, MO 63043.
DLI	Dawe's Laboratories, Inc	450 State St., Chicago Heights, IL 60411.
DGO	Day-Glo Color Corp	4732 St. Clair Ave., Cleveland, OH 44103.
DEG	Degen Oil & Chemical Co	200 Kellogg St., Jersey City, NJ 07305.
DNS	Dennis Chemical Co	2701 Papin St., St. Louis, MO 63103.
DEP	DePaul Chemical Co., Inc	44-27 Purves St., Long Island City, NY 11101.
DSO	DeSoto, Inc	1700 S. Mt. Prospect Ave., Des Plaines, IL 60018.
DEX	Dexter Chemical Corp	845 Edgewater Rd., Bronx, NY 10474.
HYC	Hysol Div	211 Franklin St., Olean, NY 14760.
MID	Midland Div	1-7 E. Water St., Waukegan, IL 60085.
DA	Diamond Shamrock Corp	1100 Superior Ave., Cleveland, OH 44114.
PLN	Disogrin Industries Corp	Grenier Field, Manchester, NH 03130.
DIX	Dixie Chemical Co	3635 W. Dallas Ave., Houston, TX 77019.
DPP	Dixie Pine Products Co., Inc	P. O. Box 470, Hattiesburg, MS 39401.
DOM	Dominion Products, Inc	882 3d Ave., Brooklyn, NY 11232.
DVC	Dover Chemical Corp. Sub. of ICC Industries, Inc.	15th & Davis Sts., Dover, OH 44622.
DBC	Dow Badische Chemical Co	602 Copper Rd., Freeport, TX 77541.
DOW	Dow Chemical Co	2020 Dow Center, Midland, MI 48640.
DCC	Dow Corning Corp	P. O. Box 1592, Midland, MI 48640.
DUP	E. I. duPont de Nemours & Co., Inc	DuPont Bldg., Wilmington, DE 19898.
DSC	Dye Specialties, Inc	26 Journal Sq., Jersey City, NJ 07306.
EPI	Eagle Pitcher Industries, Inc., Ohio Rubber Co. Div.	P. O. 1398, Denton, TX 76201.
EGR	Eagle River Chemical Corp	P. O. Box 2648, W. Helena, AR 72390.
ECC	Eastern Color & Chemical Co	35 Livingston St., Providence, RI 02904.
EK	Eastman Kodak Co	343 State St., Rochester, NY 14650.
EKT	Tennessee Eastman Co. Div	P. O. Box 511, Kingsport, TN 37662.
EKX	Texas Eastman Co. Div	P. O. Box 7444, Longview, TX 75602.
ESA	East Shore Chemical Co., Inc	1221 E. Barney Ave., Muskegon, MI 49443.
ELN	Elan Chemical Co	268 Doremus Ave., Newark, NJ 07105.
ELP	El Paso Products Co	P. O. Box 3986, Odessa, TX 79760.
EMR	Emery Industries, Inc	1300 Carew Tower, Cincinnati, OH 45202.
TCH	Trylon Div	P. O. Box 628, Mauldin, SC 29662.
EMK	Emkay Chemical Co	319 2d St., Elizabeth, NJ 07206.
EN	Endo Laboratories, Inc	1000 Stewart Ave., Garden City, NY 11530.
ENO	Enenco, Inc	P. O. Box 398, Memphis, TN 38101.
ESS	Essential Chemicals Group	28391 Essential Rd., Merton, WI 53056.
WMP	Essex Group Inc	1601 Wall St., Fort Wayne, IN 46804.
TNA	Ethyl Corp	330 S. 4th St., Richmond, VA 23231.
EVN	Evans Chemetics, Inc	90 Tokeneke Rd., Darien, CT 06820.
ENJ	Exxon Chemical Co. U.S.A	P. O. Box 3272, Houston, TX 77001.

APPENDIX

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identification code	Name of company	Office address
	FMC Corp.:	
FMN	Agricultural Chemical Div	100 Niagara St., Middleport, NY 14105.
FMB	Industrial Chemical Div	2000 Market St., Philadelphia, PA 19103 and Sawyer Ave. & River Rd., Town of Tonawanda, NY 14150.
FMP	Industrial Chemical Div	2000 Market St., Philadelphia, PA 19103.
FRP	FRP Co	P. O. Box 349, Baxley, GA 31513.
FAB	Fabricolor Manufacturing Corp	24-1/2 Van Houten St., P. O. Box 2398, Paterson, NJ 07509.
FMT	Fairmount Chemical Co., Inc	117 Blanchard St., Newark, NJ 07105.
FCA	Farmers Chemical Association, Inc	Salem Lake Dr., Long Grove, IL 60047.
FEL	Felton International, Inc	599 Johnson Ave., Brooklyn, NY 11235.
FER	Ferro Chemical Corp.:	
	Ferro Chemical Div	P. O. Box 46349, 7050 Krick Rd., Bedford, OH 44146.
	Grant Chemical Div	P. O. Box 263, Baton Rouge, LA 70821.
	Keil Chemical Div	3000 Sheffield Ave., Hammond, IN 46320.
	Ottawa Chemical Div	700 N. Wheeling St., Toledo, OH 43605.
PRD	Productol Chemical Div	13215 E. Penn St., Whittier, CA 90602.
FND	Fiber Industries, Inc	P. O. Box 10038, Charlotte, NC 28201.
RBC	Fike Chemicals, Inc	P. O. Box 546, Nitro, WV 25143.
	Firestone Tire & Rubber Co.:	
FIR	Firestone Plastics Co. Div	P. O. Box 699, Pottstown, PA 19464.
FRF	Firestone Synthetic Fibers Co	P. O. Box 450, Hopewell, VA 23869.
FRS	Firestone Synthetic Rubber & Latex Co. Div.	381 W. Wilbeth Rd., Akron, OH 44301.
FST	First Chemical Corp	P. O. Box 1427, Pascagoula, MS 39567.
FMS	First Mississippi Corp	P. O. Box 1249, Jackson, MS 39205.
FLM	Fleming Laboratories, Inc	P. O. Box 10372, Charlotte, NC 28237.
CIK	Flint Ink Corp., Cal/Ink Div	1404 4th St., Berkeley, CA 94710.
FLO	Florasynth, Inc	1640 Bronxdale Ave., Bronx, NY 10462.
FTE	Foote Mineral Co	Route 100, Exton, PA 19341.
FOM	Formica Corp	120 E. 4th St., Cincinnati, OH 45202.
FG	Foster Grant Co., Inc	289 N. Main St., Leominster, MA 01453.
FLN	Franklin Chemical Corp	2020 Bruck St., Columbus, OH 43207.
FRE	Freeman Chemical Corp	222 E. Main St., Port Washington, WI 53074.
FB	Fritzsche Dodge & Olcott, Inc	76 9th Ave., New York, NY 10011.
FLH	H. B. Fuller Co	4450 Malsbary Rd., Blue Ash, OH 45242.
GAF	GAF Corp	P. O. Box 6037, Chattanooga, TN 37401.
	Chemical Div	33 Riverside Ave., Rensselaer, NY 12144.
GAN	Gane's Chemical, Inc	1144 Avenue of the Americas, New York, NY 10036.
AKL	Gardinier Big River, Inc	P. O. Box 825, Helena, AK 72342.
GE	General Electric Co	1 Plastics Ave., Pittsfield, MA 01201 and 1350 S. Second St., Coshocton, OH 43812.
GEI	Insulating Materials Products Section	1 Campbell Rd., Schenectady, NY 12306.
SPD	Silicone Products Dept	Waterford-Halfmoon Rd., Waterford, NY 12188.
GNF	General Foods Corp., Maxwell House Div	1125 Hudson St., Hoboken, NJ 07030.
GLC	General Latex & Chemical Corp	666 Main St., Cambridge, MA 02139.
GNM	General Mills Chemicals, Inc	4620 W. 77th St., Minneapolis, MN 55435
GPM	General Plastics Manufacturing Co	3481 S. 35th St., Tacoma, WA 98409.
GNT	General Tire & Rubber Co., Chemical/Plastics Div	1 General St., Akron, OH 44329.
GRG	P. D. George Co	5200 N. 2d St., St. Louis, MO 63147.
	Georgia-Pacific Corp.:	
PSP	Bellingham Div	P. O. Box 1235, Bellingham, WA 98225.
GP	Rebecca Chemical Div	P. O. Box 629, Plaquemine, LA 70764.
GP	Resins Operations	900 S.W. 5th Ave., Portland, OR 97240.
SKO	Getty Refining & Marketing Co	P. O. Box 1650, Tulsa, OK 74102.
TID	Delaware Refinery	Delaware City, DE 19706.
TNI	The Gillette Co., Chemical Div	3500 W. 16th St., N. Chicago, IL 60064.
GIL	Gilman Paint & Varnish Co	216 W. 8th St., Chattanooga, TN 37401.
GIV	Givaudan Corp	100 Delawanna Ave., Clifton, NJ 07014.
GLY	Glyco Chemicals, Inc	51 Weaver St., Greenwich, CT 06830.
GPI	Goodpasture, Inc	P. O. Drawer 921, Brownfield, TX 79316.

SYNTHETIC ORGANIC CHEMICALS, 1976

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identi-fication code	Name of company	Office address
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Co. Div.	6100 Oak Tree Blvd., Cleveland, OH 44131.
GYR	Goodyear Tire & Rubber Co	1144 E. Market St., Akron, OH 44316.
	W. R. Grace & Co.:	
GCC	AG Chem. Group	P. O. Box 277, Memphis, TN 38101.
GRH	Hatco Chemical Div	King George Post Rd., Fords, NJ 08863.
MRO	Hatco Polyester Div	1711 Elizabeth Ave. West, Linden, NJ 07036.
HMP	Organic Chemicals Div	Poisson Ave., Nashua, NH 03060.
GRD	Polymers & Chemicals Div	55 Hayden Ave., Lexington, MA 02173.
GPR	Grain Processing Corp	1600 Oregon St., Muscatine, LA 52761.
GRA	Great American Chemical Corp	650 Water St., Fitchburg, MA 01420.
GTL	Great Lakes Chemical Corp	P. O. Box 2200, West Lafayette, IN 47906.
GRW	Great Western Sugar Co	P. O. Box 5308, Terminal Annex, Denver, CO 80217.
GNM	Greenwood Chemical Co	P. O. Box 26 - State Highway #690, Greenwood, VA. 22943.
GOC	Gulf Oil Corp., Gulf Oil Chemicals Co. - U. S.	P. O. Box 3766, Houston, TX 77001.
GTH	Guth Corp	322 S. Center St., Hillside, IL 60162.
HNC	H & N Chemical Co	90 Maltese Dr., Totowa, NJ 07512.
HL1	Haag Laboratories, Inc	14010 S. Seeley Ave., Blue Island, IL 60406.
HAL	C. P. Hall Co	7300 S. Central Ave., Chicago, IL 60638.
FOC	Handschy Chemical Co., Farac Oil and Chemical Div.	13601 S. Ashland Ave., Riverdale, IL 60627.
HAN	Hanna Chemical Coatings Corp	P. O. Box 147, Columbus, OH 43216.
HDM	Hardman, Inc	600 Cortlandt St., Belleville, NJ 07109.
HSH	Harshaw Chemical Co. Sub. of Kewanee Oil Co.	1945 E. 97th St., Cleveland, OH 44106.
HRT	Hart Products Corp	173 Sussex St., Jersey City, NJ 07302.
HVG	Haveg Industries, Inc. Sub. of Hercules, Inc.	900 Greenback Rd., Wilmington, DE 19808.
HKY	Hawkeye Chemical Co	P. O. Box 899, Clinton, IA 52733.
SCP	Henkel, Inc	400 Alfred Ave., Teaneck, NJ 07666.
HCR	Hercor Chemical Corp	Petrochemical Complex, Ponce, PR 00731.
HPC	Hercules, Inc	910 Market St., Wilmington, DE 19899.
HER	Heresite & Chemical Co	822 S. 14th St., Manitowoc, WI 54220.
HET	Heterochemical Corp	111 E. Hawthorne Ave., Valley Stream, NY 11580.
HEW	Hewitt Soap Co., Inc	333 Linden Ave., Dayton, OH 45403.
HEX	Hexagon Laboratories, Inc	3536 Peartree Ave., Bronx, NY 10475.
	Hexcel Corp.:	
FIN	Fine Organics Div	205 Main St., Lodi, NJ 07644.
REZ	Rezolin Div	20701 Nordhoff St., Chatsworth, CA 91311.
HDG	Hodag Chemical Corp	7247 N. Central Park Ave., Skokie, IL 60076.
HOF	Hoffmann-LaRoche, Inc	324-424 Kingsland St., Nutley, NJ 07110.
HK & HKD	Hooker Chemicals & Plastics Corp	MPO Box 8, Niagara Falls, NY 14302, and Walck Rd., N. Tonawanda, NY 14121.
RUB	Ruco Div	P. O. Box 456, Burlington, NJ 08016.
EFH	E. F. Houghton & Co	303 W. Lehigh Ave., Philadelphia, PA 19133.
HMY	Humphrey Chemical Co	Devine St., North Haven, CT 06473.
WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.	P. O. Box 4249, E. Providence, RI 02914.
HNT	Huntington Laboratories, Inc	P. O. Box 710, Huntington, IN 46750.
HUS	Husky Industries, Inc	62 Perimeter Center E., Atlanta, GA 30346.
HYN	Hynson, Westcott & Dunning, Inc	Charles and Chase Sts., Baltimore, MD 21201.
ICI	ICI United States Inc.:	
	Plastics Div	Wilmington, DE 19897.
	Specialty Chemicals Group	Wilmington, DE 19897.
IMC	IMC Chemical Group, Inc	P. O. Box 207, Terre Haute, IN 47808; P. O. Box 149, Orrington, ME 04474 and 100 Lister Ave., Newark, NJ 07105.
	McWorter Resins	P. O. Box 308, Cottage Pl., Carpentersville, IL 60110.
	Nitroparaffin Div	IMC Plaza, Libertyville, IL 60048.

APPENDIX

TABLE 1.--Synthetic organic chemicals: Alphabetical directory of manufacturers, by company, 1976--Continued

Identification code	Name of company	Office address
RAY	ITT Rayonier, Inc	605 3d Ave., New York, NY 10016.
INP	Indpol, Inc	P. O. Box 1087, Tustin, CA 92680.
INL	Inland Steel Co., Inland Steel Container Co.	4300 W. 130th St., Chicago, IL 60658.
ICC ICF	Inmont Corp	1255 Broad St., Clifton, NJ 07015, and 150 Wagaraw Rd., Hawthorne, NJ 07506.
WM	Inolex Corp	Jackson & Swanson Sts., Philadelphia, PA 19148.
WIL	Inolex Pharmaceutical Div	2600 Bond St., Park Forest South, IL 60466.
SPC	Insilco Corp., Sinclair Paint Co. Div	3960 E. Washington Blvd., Los Angeles, CA 90023.
IPP	International Flavor and Fragrances, Inc	521 W. 57th St., New York, NY 10019.
IPC	Interplastic Corp	2015 NE. Broadway St., Minneapolis, MN 55413.
CCA	Interstab Chemical, Inc	500 Jersey Ave., New Brunswick, NJ 08903.
IOC	Ionac Chemical Co. Div. of Sybron Corp	Birmingham Rd., Birmingham, NJ 08011.
IRI	Ironsides Resins, Inc	270 W. Mound St., Columbus, OH 43216.
JCC	Jefferson Chemical Co., Inc	P. O. Box 52332, Houston, TX 77052.
JFR	George A. Jeffreys & Co., Inc	P. O. Box 709, Salem, VA 24153.
JEN	Jennison-Wright Corp	P. O. Box 691, Toledo, OH 43694.
JRG	Andrew Jergens Co	2535 Spring Grove Ave., Cincinnati, OH 45214.
JSC	Jersey State Chemical Co	59 Lee Ave., Haledon, NJ 07508.
UPF	Jim Walter Resources, Inc	3300 1st Ave. N., Birmingham, AL 35222.
JNS	S. C. Johnson & Son, Inc	1525 Howe St., Racine, WI 53403.
JOB	Jones-Blair Co	2728 Empire Central, Dallas, TX 75235.
JOR	Jordan Chemical Co	1830 Columbia Ave., Folcraft, PA 19032.
KVP	KV Products	2503 S. Hanley Rd., St. Louis, MO 63144.
	Kaiser Aluminum & Chemical Corp.:	
SNI	Kaiser Agricultural Chemicals Div	P. O. Box 246, Savannah, GA 31402.
KAI	Kaiser Chemicals	P. O. Box 337, Gramercy, LA 70052.
KLM	Kalama Chemical, Inc	P. O. Box 427, Kalama, WA 98625.
KF	Kay-Fries Chemicals, Inc	200 Summit Ave., Montvale, NJ 07645.
KMP	Kelly-Moore Paint Co	1015 Commercial St., San Carlos, CA 94070.
	Kennecott Copper Corp.:	
KCC	Chino Mines Div	Hurley, MN 88043.
KCU	Utah Copper Div	P. O. Box 11299, Salt Lake City, UT 84147.
AMP	Kerr-McGee Chemical Corp	1101 Kerr Tower, Oklahoma City, OK 73102.
BKL	Kewanee Industries, Inc., Millmaster Chemical Co. Div.	99 Park Ave., New York, NY 10016.
KYS	Keysor Corp	26000 Springbrook Ave., Saugus, CA 91350.
KCW	Keystone Color Works, Inc	151 W. Gay Ave., York, PA 17403.
KNP	Knapp Products, Inc	187 Garibaldi Ave., Lodi, NJ 07644.
KMC	Kohler-McLister Paint Co	P. O. Box 546, Denver, CO 80201.
KON	H. Kohnstamm & Co., Inc	161 Avenue of the Americas, New York, NY 10013.
KPT	Koppers Co., Inc.:	
	Organic Materials Div	Koppers Bldg., Pittsburgh, PA 15219.
	Roads Materials Div	Koppers Bldg., Pittsburgh, PA 15219.
HUM	Kraft, Inc., Humko Products Div	P. O. Box 398, Memphis, TN 38101.
LKY	Lake States Div. of St. Regis Paper Co	603 W. Davenport St., Rhinelander, WI 54501.
LAK	Lakeway Chemicals, Inc	5025 Evanston Ave., Muskegon, MI 49443.
LUR	Laurel Products Corp	2600 E. Tioga St., Philadelphia, PA 19134.
LEA	Leatex Chemical Co	2722 N. Hancock St., Philadelphia, PA 19133.
LEV	Lever Brothers Co	390 Park Ave., New York, NY 10022.
LVR	C. Lever Co., Inc	736 Dunks Ferry Rd., Cornwells Hgts, PA 19020.
BLS	Life Savers, Inc	Church St., Canajoharie, NY 13317.
LIL	Eli Lilly & Co	307 E. McCarty St., Indianapolis, IN 46206 and G.P.O. Box 4388, San Juan, PR 00936.
BRD	Lonza, Inc	22-10 Route 208, Fair Lawn, NJ 07410.
T2C	Magnesium Elektron, Inc	Star Route A, Box 202-1, Flemington, NJ 08822.
MGR	Magruder Color Co., Inc	1 Virginia St., Newark, NJ 07114.
MAL	Mallinckrodt Chemical Works	2nd & Mallinckrodt, St. Louis, MO 63147.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identification code	Name of company	Office address
TRD	Manufacturing Enterprises, Inc., Squibb Manufacturing, Inc., Trade Enterprises, Inc., Ersana, Inc.	P. O. Box 609, Humacao, PR 00661.
MOR	Marathon Morco Co	P. O. Drawer C, 4401 Park Ave., Dickinson, TX 77539.
MOC	Marathon Oil Co., Texas Refining Div	P. O. Box 1191, Texas City, TX 77590.
MRB	Marblette Co	37-31 30th St., Long Island City, NY 11101.
MRD	Marden-Wild Corp	500 Columbia St., Somerville, MA 02143.
MRV	Marlowe-Van Loan Corp	P. O. Box 1851, High Point, NC 27261.
SDC	Martin-Marietta Corp., Sodyeco Div	P. O. Box 10098, Charlotte, NC 28237.
MRX	Max Marx Color & Chemical Co	192 Coit St., Irvington, NJ 07111.
MCA	Masonite Corp., Alpine Chemical Div	P. O. Box 2392, Gulfport, MS 39503.
MAY	Otto B. May, Inc	52 Amsterdam St., Newark, NJ 07105.
MCC	McCloskey Varnish Co	7600 State Rd., Philadelphia, PA 19136.
MGK	McLaughlin Gormley King Co	8810 10th Ave., N., Minneapolis, MN 55427.
MDJ	Mead Johnson & Co	2404 Penna. St., Evansville, IN 47721.
MLC	Melamine Chemicals, Inc	P. O. Box 748, Donaldsonville, LA 70346.
MRK	Merck & Co., Inc	126 E. Lincoln Ave., Rahway, NJ 07065.
MER	Merichem Co	1914 Haden Rd., Houston, TX 77015.
PFP	Midwest Manufacturing Corp	Oak St. at Bluff Rd., Burlington, IA 52601.
MLS	Miles Laboratories, Inc.:	
	Marschall Div	1127 Myrtle St., Elkhart, IN 46514.
	Sumner Div	1127 Myrtle St., Elkhart, IN 46514.
MIL	Milliken & Co., Milliken Chemical Div	P. O. Box 817, Inman, SC 29349.
	Millmaster Onyx Corp.:	
ONX	Onyx Chemical Co. Div	190 Warren St., Jersey City, NJ 07302.
RPC	Refined-Onyx Div	624 Schuyler Ave., Lyndhurst, NJ 07071.
MMM	Minnesota Mining & Manufacturing Co	3M Center, St. Paul, MN 55101.
MIR	Miranol Chemical Co., Inc	660 Stuyvesant Ave., Irvington, NJ 07111.
MSC	Mississippi Chemical Corp	P. O. Box 388, Yazoo City, MS 39194.
MOB	Mobay Chemical Corp	Penn Lincoln Parkway, W. Pittsburgh, PA 15205.
CHG	Chemagro Agricultural Div	P. O. Box 4913, Kansas City, MO 64120.
VPC	Verona Div	Iorio Ct., Union, NJ 07083.
SM	Mobil Oil Corp	P. O. Box 900, Dallas, TX 75221.
	Mobil Chemical Co	P. O. Box 3868, Beaumont, TX 77704.
	Chemical Coatings Div	1024 South Ave., Plainfield, NJ 07062.
	Phorphorus Div	P. O. Box 26683, Richmond, VA 23261.
MOA	Mona Industries, Inc	65 E. 23d St., Paterson, NJ 07524.
MNO	Monochem, Inc	P. O. Box 488, Geismar, LA 70734.
MNR	Monroe Chemical Co	Saville Ave. at 4th St., Eddystone, PA 19013.
MON	Monsanto Co	2710 Lafayette St., Santa Clara, CA 95050 and 800 N. Lindbergh Blvd., St. Louis, MO 63166.
	Bircham Bend Plant	190 Grochmal Ave., Indian Orchard, MA 01151.
	Chocolate Bayou Plant	P. O. Box 711, Alvin, TX 77511.
	Plastics Div	5100 W. Jefferson Ave., Trenton, MI 48183; River Rd., Addyston, OH 45001 and P. O. Box 1311, Texas City, TX 77590.
	Springfield Plant	730 Worcester St., Indian Orchard, MA 01151.
	Textiles Div	800 N. Lindbergh Blvd., St. Louis, MO 63166.
MTO	Montrose Chemical Corp. of California	3250 Wilshire Blvd, Suite 1800, Los Angeles, CA 90010.
MCI	Mooney Chemicals, Inc	2301 Scranton Rd., Cleveland, OH 44113.
MCP	Moretex Chemical Products, Inc	P. O. 1799, Spartanburg, SC 29304.
MRT	Morton Chemical Co. Div. of Morton Norwich Products, Inc.	110 N. Wacker Dr., Chicago, IL 60606.
MOT	Motomco, Inc	267 Vreeland Ave., Paterson, NJ 07513.
PNX	Murphy-Phoenix Co	9505 Cassius Ave., Cleveland, OH 44105.
NTL	NL Industries, Inc	1221 Aveune of the Americas, New York, NY 10020.
CHN	N-Ren Corp., Cherokee Nitrogen Div	P. O. Box 429, Pryor, OK 74361.
NLC	Nalco Chemical Co	2901 Butterfield Rd, Oak Brook, IL 60521.
LEM	Napp Chemicals, Inc	199 Main St., Lodi, NJ 07644.
NTB	National Biochemical Co	3127 W. Lake St., Chicago, IL 60612.
NTC	National Casein Co	601 W. 80th St., Chicago, IL 60620.

APPENDIX

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identification code	Name of company	Office address
USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co.	99 Park Ave., New York, NY 10016.
NMC	National Milling & Chemical Co	4601 Flat Rock Rd., Philadelphia, PA 19127.
USI	National Petro Chemical Corp	99 Park Ave., New York, NY 10016.
NSC	National Starch & Chemical Corp	10 Finderne Ave., Bridgewater, NJ 08876.
NES	Nease Chemical Co., Inc	P. O. Box 221, State College, PA 16801.
NEP	Nepera Chemical Co., Inc	Route 17, Harriman, NY 10926.
NEV	Neville Chemical Co	Neville Island P. O., Pittsburgh, PA 15225.
NLO	Niklor Chemical Co	2060 E. 220th St., Long Beach, CA 90810.
NIL	Nilok Chemicals, Inc	2235 Langdon Farm Rd., Cincinnati, OH 45230.
JDC	Nipak, Inc	P. O. Box 2820, Dallas, TX 75221.
CNP	Nipro, Inc	P. O. Box 1483, Augusta, GA 30903.
NOC	Norac Co., Inc	405 S. Motor Ave., Azusa, CA 91703.
	Mathe Chemical Co. Div	169 Kennedy Dr., Lodi, NJ 07644.
NEO	Norda, Inc	140 Route 10, E. Hanover, NJ 07936.
NPV	Norris Paint & Varnish Co., Inc	P. O. Box 2023, Salem, OR 97308.
LMI	North American Chemical Co	19 S. Canal St., Lawrence, MA 01843.
ATP	Northern Fine Chemicals, Inc	93 Main St., Franklin, NJ 07416.
NWP	Northern Petrochemical Co	2350 E. Devon Ave., Des Plaines, IL 60018.
NW	Northwestern Chemical Co	120 N. Aurora St., W. Chicago, IL 60185.
NPC	Northwest Petrochemical Corp	P. O. Box 99, Anacortes, WA 98221.
NOR	Norwich Pharmacal Co	17 Eaton Ave., Norwich, NY 13815.
NCW	Nostrip Chemical Works, Inc	P. O. Box 160, Pedricktown, NJ 08067.
CAD	Noury Chemical Corp	2153 Lockport-Olcott Rd., Burt, NY 14028.
NVT	Novamont Corp., Neal Works	P. O. Box 189, Kenova, WV 25530.
CMG	Nyanza, Inc	Maguno Rd., Ashland, MA 01721.
OBC	O'Brien Corp	2001 W. Washington Ave., South Bend, IN 46634.
FLW	Fuller-O'Brien Div	450 E. Grand Ave., S. San Francisco, CA 94080.
OMC	Olin Corp	120 Long Ridge Rd., Stamford, CT 06904 and P. O. Box 991, Little Rock, AR 72203.
OPC	Orbis Products Corp	140 Route 10, E. Hanover, NJ 07936.
ORG	Organics, Inc	7125 N. Clark St., Chicago, IL 60628.
BSW	Original Bradford Soap Works, Inc	200 Providence St., W. Warwick, RI 02893.
OCF	Owens-Corning Fiberglas Corp	Fiberglas Tower, Toledo, OH 43659.
OCC	Oxirane Chemical Co	10801 Choate Rd., Pasadina, TX 77507.
OXC	Oxochem Enterprise	King George Post Rd., Fords, NJ 08863.
PLB	P L Biochemical, Inc	1037 W. McKinley Ave., Milwaukee, WI 53201.
PPG	PPG Industries, Inc	1 Gateway Center, Pittsburgh, PA 15222.
PVO	PVO International, Inc., Chemical Specialties Div.	416 Division St., Boonton, NJ 07005.
AMR	Pacific Resins & Chemicals, Inc	1754 Thorne Rd., Tacoma, WA 93421.
PNA	Pan American Chemical Corp	21 Stable Ct., Wilmington, DE 19803.
PNT	Pantasote Co. of New York, Inc	26 Jefferson St., Passaic, NJ 07056.
PD	Parke, Davis & Co. Sub. of Warner-Lambert Co.	Jos. Campau at the River, Detroit, MI 48232.
PSC	Passaic Color & Chemical Co	28-36 Paterson St., Paterson, NJ 07501.
KAL	Pathan Chemical Co	427 Moyer St., Philadelphia, PA 19125.
CHP	C. H. Patrick & Co., Inc	P. O. Box 2526, Greensville, SC 29602.
CCH	Pearsall Chemical Corp	P. O. Box 437, Houston, TX 77001.
PEK	Peck's Products Co	610 E. Clarence Ave., St. Louis, MO 63147.
PCH	Peerless Chemical Co	12416 Cloverdale Ave., Detroit, MI 48204.
AES	Penetone Corp	74 Hudson Ave., Tenafly, NJ 07670.
PAS	Pennwalt Corp	3 Parkway, Philadelphia, PA 19102.
WTL	Lucidol Div	1740 Military Rd., Buffalo, NY 14240.
PAR	Pennzoil Co., Penreco Div	Union Bank Bldg., Butler, PA 16001.
PER	Perry & Derrick Co., Inc	2510 Highland Ave., Norwood, OH 45212.
UDI	Petrochemicals Co., Inc	P. O. Box 2199, Fort Worth, TX 76101.
PTT	Petro-Tex Chemical Corp	8600 Park Place Blvd., Houston, TX 77017.
PFN	Pfanstiehl Laboratories, Inc	1219 Glen Rock Ave., Waukegan, IL 60085.
PCW	Pfister Chemical, Inc	Linden Ave., Ridgefield, NJ 07657.
PFZ	Pfizer, Inc	235 E. 42d St., New York, NY 10017.
	Pfizer Pharmaceuticals, Inc	P. O. Box 628, Barceloneta, PR 00617.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identi-fication code	Name of company	Office address
PHR	Pharmachem Corp	P. O. Box 1035, Bethlehem, PA 18018.
PLC	Phillips Petroleum Co	16D2 Phillips Bldg., Bartlesville, OK 74003.
PPR	Phillips Puerto Rico Core, Inc	GPO Box 4129, San Juan, PR 00936.
PIC	Pierce Chemical Co	P. O. Box 117, Rockford, IL 61103.
PIL	Pilot Chemical Co	11756 Burke St., Santa Fe Springs, CA 90670.
PPL	Pioneer Plastics Div. of LOF Plastics, Inc.	Pionite Rd., Auburn, ME 04210.
PIT	Pitt-Consol Chemical Co	P. O. Box 1267, 1000 S. Pine, Ponca City, OK 74601.
PLS	Plastics Engineering Co	P. O. Box 758, Sheboygan, WI 53081.
PMC	Plastics Manufacturing Co	2700 S. Westmoreland Ave., Dallas, TX 75224.
PLX	Plex Chemical Corp	1205 Atlantic St., Union City, CA 94487.
PFW	Polak's Frutal Works, Inc	33 Sprague Ave., Middletown, NY 10940.
POL	Polymer Corp	2120 Fairmont Ave., Reading, PA 19605.
PYZ	Polyrez Co., Inc	P. O. Box 320, Woodbury, NJ 08096.
SOL	Polysar Resins, Inc	29 Fuller St., Leominster, MA 01453.
PVI	Polyvinyl Chemical Ind	730 Main St., Wilmington, MA 01887.
POP	Pope Chemical Corp	33 6th Ave., Paterson, NJ 07524.
PRT	Pratt & Lambert, Inc	P. O. Box 22, Buffalo, NY 14240.
PMP	Premier Malt Products, Inc	917 W. Juneau Ave., Milwaukee, WI 53201.
PPC	Premier Petrochemicals Co	Meadows Bldg., Dallas, TX 75206.
PG	Procter & Gamble Co.:	
	Procter & Gamble Mfg. Co	P. O. Box 599, Cincinnati, OH 45201.
	Procter & Gamble Paper Products Co.	6100 Center Hill Rd., Cincinnati, OH 45224.
PC	Proctor Chemical Co., Inc	P. O. Box 399, Salisbury, NC 28144.
PRC	Products Research & Chemical Corp	2919 Empire Ave., Burbank, CA 91505.
PUB	Publicker Industries, Inc	1429 Walnut St., Philadelphia, PA 19102.
PTO	Puerto Rico Chemical Co., Inc	P. O. Box 496, Arecibo, PR 00613.
PUE	Puerto Rico Olefins Co	Firm Delivery, Ponce, PR 00731.
PRX	Purex Corp	5101 Clark Ave., Lakewood, CA 90712.
QCP	Quaker Chemical Corp	Lime & Elm Sts., Conshohocken, PA 19428.
QKO	Quaker Oats Co	Merchandise Mart Plaza, Chicago, IL 60654.
QUN	K. J. Quinn & Co., Inc	195 Canal St., Malden, MA 02148.
RSA	R.S.A. Corp	690 Saw Mill River Rd., Ardsley, NY 10502.
RLS	Rachelle Laboratories, Inc	700 Henry Ford Ave., Long Beach, CA 90801.
RCN	Racon, Inc	P. O. Box 198, Wichita, KS 67201.
RAB	Raybestos-Manhattan, Inc., R. M. Friction Materials Co. Div.	75 E. Main St., Stratford, CT 06497.
RED	Red Spot Paint & Varnish Co., Inc	110 Main St., Evansville, IN 47703.
REH	Reheis Chemical Co. Div. of Armour Pharmaceutical Co.	111 W. Clarendon, Station 3206, Phoenix, AZ 85077.
RCI	Reichhold Chemicals, Inc	525 N. Broadway, White Plains, NY 10603.
	Reichhold Polymers, Inc	525 N. Broadway, White Plains, NY 10603.
RIL	Reilly Tar & Chemical Corp	1615 Merchants Bank, Indianapolis, IN 46204.
REL	Reliance Universal, Inc., Louisville Resins Operation	P. O. Box 21423, Louisville, KY 40221.
REM	Remington Arms Co., Inc	939 Barnum Ave., Bridgeport, CT 06602.
RSC	Resinous Chemicals Corp	1399 W. Blancke St., Linden, NJ 07036.
RSY	Resyn Corp	1401 W. Blancke St., Linden, NJ 07036.
RCC	Rexene Polyolefins Co	P. O. Box 37, Paramus, NJ 07652.
RCC	Rexene Styrenics Co	W. 115 Century Rd., Paramus, NJ 07652.
RCD	Richardson Co.:	
	Organic Chemical Div	2400 E. Devon Ave., Des Plaines, IL 60018.
	Polymeric Systems Div	15 Meigs Ave., Madison, CT 06443.
LKL	Richardson-Merrell, Inc., Merrell-National Laboratories Div.	110 E. Amity Rd., Cincinnati, OH 45215.
AMS	Ridgway Color & Chemical	75 Front St., Ridgway, PA 15853.
RIK	Riker Laboratories, Inc. Sub. of 3M Co	19901 Nordhoff St., Northridge, CA 91324.
RSN	Rilsan Corp	139 Harristown Rd., Glen Roc, NJ 07452.
RT	Ritter International	4001 Goodwin Ave., Los Angeles, CA 90039.
RIV	Riverdale Chemical Co	220 E. 17th St., Chicago Heights, IL 60411.
ROB	Robeco Chemicals, Inc	99 Park Ave., New York, NY 10016.
RBT	Robintech, Inc	1407 Texas St., Fort Worth, TX 76102.

APPENDIX

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identi-fication code	Name of company	Office address
MFG	Rockwell International Corp., Plastics Div.	4501 Benefit Ave., Ashtabula, OH 44004.
ORT	Roehr Chemicals Div. of Aceto Industrial Chemical Corp.	52-20 37th St., Long Island City, NY 11101.
RGC	Rogers Corp	Rogers, CT 06263.
RH	Rohm & Haas Co	Independence Mall West, Philadelphia, PA 19105.
RUC	Rubicon Chemicals, Inc	P. O. Box 517, Geismar, LA 70734.
GLD	SCM Corp.:	
	Coatings & Resins Div	299 Park Ave., New York, NY 10017.
	Durkee Div	299 Park Ave., New York, NY 10017.
	Glidden-Durkee Div	299 Park Ave., New York, NY 10017.
NPR	Safeway Stores, Inc	8390 Capwell Dr., Oakland, CA 94604.
SLM	Salem Oil & Grease Co	60 Grove St., Salem, MA 01970.
SAL	Salsbury Laboratories	2000 Rockford Rd., Charles City, IA 50616.
S	Sandoz, Inc	P. O. Box 357, Fair Lawn, NJ 07410.
	Colors & Chemicals Div	Route #10, E. Hanover, NJ 07936.
	Crop Protection Dept	P. O. Box 207, Wasco, CA 93280.
SAR	Sartomer Industries, Inc	Gov. Printz Blvd. & Wanamaker Ave., Essington, PA 19029.
SCN	Schenectady Chemicals, Inc	P. O. Box 1046, Schenectady, NY 12301.
SBC	Scher Bros., Inc	P. O. Box 538, Allwood Station, Clifton, NJ 07012.
SCH	Schering Corp	1011 Morris Ave., Union, NJ 07083.
SCO	Scholler Bros., Inc	Collins and Westmoreland Sts., Philadelphia, PA 19134.
SPA	Scott Paper Co	106 E. Central Ave., Oconto Falls, WI 54154.
SEA	Seaboard Chemicals, Inc	30 Foster St., Salem, MA 01970.
SRL	G. D. Searle & Co	P. O. Box 5110, Chicago, IL 60680.
SKP	Shakespeare Co., Monofilament Div	P. O. Box 246, Columbia, SC 29202.
SHA	Shanco Plastics & Chemicals Co	2716 Kenmore Ave., Tonawanda, NY 14150.
SHO	Shell Oil Co	P. O. Box 2463, Houston, TX 77001.
SHC	Shell Chemical Co. Div	One Shell Plaza, P. O. Box 2463, Houston, TX 77001.
SHP	Shepherd Chemical Co	4900 Beech St., Norwood, OH 45212.
SW	Sherwin-Williams Co	101 Prospect Ave., NW Cleveland, OH 44115.
SID	George F. Siddall Co., Inc	P. O. Box 925, Spartanburg, SC 29304.
SMP	J. R. Simplot Co., Minerals	P. O. Box 912, Pocatello, ID 83210.
SIM	Simpson Timber Co.	2301 N. Columbia Blvd., Portland, OR 97217.
GFS	G. Frederick Smith Chemical Co	867 McKinley Ave., Columbus, OH 43223.
SK	Smith, Kline Chemicals	1500 Spring Garden St., Philadelphia, PA 19101.
SLT	Soltex Polymer Corp	P. O. Box 1000, Deer Park, TX 77536.
SLC	Soluol Chemical Co., Inc	Green Hill and Market Sts., W. Warwick, RI 02893.
SAC	Southeastern Adhesives Co	P. O. Box 791, Lenoir, NC 28645.
SOP	Southern Chemical Products Co., Inc	P. O. Box 205, Macon, GA 31202.
SOS	Southern Sizing Co	1550 E. Taylor Ave., East Point, GA 30344.
SPL	Spaulding Fibre Co., Inc	310 Wheeler St., Tonawanda, NY 14150.
OMS	E. R. Squibb & Sons, Inc	Georges Rd., Brunswick, NJ 08903.
STA	A. E. Staley Mfg. Co	2200 E. Eldorado St., Decatur, IL 62525.
UBS	Chemical Specialties Div	2200 E. Eldorado St., Decatur, IL 62525.
CLN	Standard Brands, Inc., Clinton Corn Processing Co. Div.	1251 Beaver Channel Parkway, Clinton, IA 52733.
SOC	Standard Oil Co. of California, Chevron Chemical Co.	575 Market St., San Francisco, CA 94105.
SIO	Standard Oil Co. (Ohio)	270 Midland Bldg., Cleveland, OH 44130.
STT	Standard T Chemical Co	P. O. Box A-3351, Chicago, IL 60690.
STG	Stange Co	342 N. Western Ave., Chicago, IL 60612.
AME	Stauffer Chemical Co	P. O. Box 1110, Long Beach, CA 90801.
SFA	Agricultural Div	636 California St., San Francisco, CA 94108.
SFC	Calhio Chemicals, Inc	636 California St., San Francisco, CA 94108.
SFF	Food Ingredients Div	636 California St., San Francisco, CA 94108.
SFI	Industrial Div	636 California St., San Francisco, CA 94108.
SFP	Plastics Div	636 California St., Sao Francisco, CA 94108.
SFS	Specialty Div	636 California St., San Francisoc, CA 94108.
SWS	SWS Silicones Div	636 California St., San Francisco, CA 94108.
STP	Stepan Chemical Co	RR #1, Elwood, IL 604217 and 100 West Hunter Ave., Maywood, NJ 07607.
NPI	Polychem Dept	51 Eames St., Wilmington, MA 01887.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identification code	Name of company	Office address
	Sterling Drug, Inc.:	
SDG	Glenbrook Laboratories Div	90 Park Ave., New York, NY 10016.
SDH	Hilton-Davis Chemical Co. Div	2235 Langdon Farm Rd., Cincinnati, OH 45237.
TMS	Thomasset Colors Div	120 Lister Ave., Newark, NJ 07105.
SDW	Winthrop Laboratories Div	90 Park Ave., New York, NY 10016.
SLV	Sterwin Chemicals, Inc	Military Rd., Rothschild, WI 54474.
OTC	Story Chemical Corp	500 Agard Rd., Muskegon, MI 49445.
STY	Styrochem Corp	Petrochemical Complex, Ponce, PR 00731.
SBP	Sugar Beet Products Co	P. O. Box 1387, Saginaw, MI 48605.
	Sun Chemical Corp.:	
SNW	Chemical Div	P. O. Box 70, Chester, SC 29706.
SNA	Pigments Div	441 Tompkins Ave., Staten Island, NY 10305.
SKG	Sunkist Growers, Inc	P. O. Box 7888, Van Nuys, CA 91409.
SUN	Sun Oil Co	240 Radnor-Chester Rd., St. Davids, PA 19087.
SNO	SunOlin Chemical Co	P. O. Box F, Claymont, DE 19703.
SNT	Suntide Refining Co	P. O. Box 2608, Corpus Christi, TX 78403.
SAG	Swift Agricultural Chemicals	P. O. Box 2175, Beaumont, TX 77704.
BUC	Synalloy Corp., Blackman-Uhler Chemical Div.	P. O. Box 5627, Spartanburg, SC 29301.
FAR	Syncon Resins, Inc	77 Jacobus Ave., S. Kearny, NJ 07032.
FCD	Synres Chemical Corp	209 N. Michigan Ave., Kenilworth, NJ 07033.
HFT	Syntex Agribusiness, Inc	P. O. Box 1246 SSS, Springfield, MO 65805.
TCC	Tanatex Chemical Corp	P. O. Box 388, Lyndhurst, NJ 07071.
CST	Charles S. Tanner Co	1310 Barcelona Dr., Greensville, SC 29605.
TBO	Tauber Oil Co	1610 Melrose Blvd., Houston, TX 77052.
TEK	Teknor Apex Co	505 Central Ave., Pawtucket, RI 02662.
HN	Tenneco Chemicals, Inc	Park Eighty Plaza West-One, Saddle Brook, NJ 07662.
TOC	Tenneco Oil Co	P. O. Box 2511, Houston, TX 77001.
TVA	Tennessee Valley Authority	Muscle Shoals, AL 35660.
TER	Terra Chemicals International, Inc	P. O. Box 1828, Sioux City, IA 51121.
COO	Terrell Corp	820 Woburn St., Wilmington, MA 01887.
TX	Texaco, Inc	135 E. 42 St., New York, NY 10017.
TSA	Texas Alkyls, Inc	P. O. Box 600, Deer Park, TX 77536.
TUS	Texas-U.S. Chemical Co	P. O. Box 667, Port Neches, TX 77651.
TXC	Tex Chem Co., Inc	20-21 Wagaraw Rd., Fair Lawn, NJ 07410.
TCI	Texize Chemicals, Co	P. O. Box 368, Greenville, SC 29602.
SKT	Textron, Inc., Spencer Kellogg Div	120 Delaware Ave., Buffalo, NY 14240.
TKL	Thiokol Corp	P. O. Box 1000, Newtown, PA 18940.
SOR	Thomason Industries, Inc., Southern Resin Div.	P. O. Drawer 1600, Fayetteville, NC 29302.
TMH	Thompson-Hayward Chemical Co	5200 Speaker Rd., Kansas City, MO 66110 and 2 E. Madison St., Waukegan, IL 60085.
TRC	Toms River Chemical Corp	P. O. Box 71, Toms River, NJ 08753.
ACT	Arthur C. Trask Co	7666 W. 63d St., Summit, IL 60501.
TRI	Triad Chemical	P. O. Box 310, Donaldsonville, LA 70346.
TRO	Troy Chemical Co	One Avenue L, Newark, NJ 07105.
UPM	UOP, Inc	10 UOP Plaza, Algonquin & Mt. Prospect Rd., Des Plaines, IL 60016.
UOP	UOP Chemical Div	State Highway 17, E. Rutherway, NJ 07073.
ARM	USS Agri-Chemicals Div of U.S. Steel Corp	P. O. Box 1685, Atlanta, GA 30301.
USS	USS Chemicals Div. of U.S. Steel Corp	600 Grant St., Rm. 2880, Pittsburgh, PA 15230.
UHL	Paul Uhlich & Co., Inc	1 Railroad Ave., Hastings on the Hudson, NY 10706.
UNG	Ungerer & Co	161 Avenue of the Americas, New York, NY 10013.
NCI	Union-Camp Corp	P. O. Box 6170, Jacksonville, FL 32205.
WTH	Chemical Div., Dover Plant	P. O. Box 220, Dover, OH 44622.
UCC	Union Carbide Corp	270 Park Ave., New York, NY 10017.
UOC	Union Oil Co. of California	200 E. Golf Rd., Palatine, IL 60067.
USR	Uniroyal, Inc., Chemical Div	Emic Bldg., Naugatuck, CT 06770.
SWT	Unitech Chemical, Inc	115 W. Jackson Blvd., Chicago, IL 60604.
UNN	United Chemical Corp. of Norwood	Endicott St., Norwood, MA 02062.

APPENDIX

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1976--CONTINUED

Identi-fication code	Name of company	Office address
UNP	United Chemical Products Corp----------------	472 York St., Jersey City, NJ 07302.
UNO	United-Erie, Inc------------------------------	438 Huron St., Erie, PA 16512.
ROM	United Merchants & Manufacturers, Inc., Roma Chemical Div.	749 Quequechan St., Fall River, MA 02721.
USB	U.S. Borax Research Corp---------------------	3075 Wilshire Blvd., Los Angeles, CA 90005.
HLM	U.S. Industries, Inc., E. Helman Co. Div----	P. O. Box 5129, Akron, OH 44313.
USO	U.S. Oil Co----------------------------------	P. O. Box 4228, E. Providence, RI 02914.
UPJ	Upjohn Co------------------------------------	7000 Portage Rd., Kalamazoo, MI 49002.
CWN	Fine Chemical Div----------------------------	410 Sackett Point Rd., North Haven, CT 06473.
VAL	Valchem Chemical Div. of United Merchants & Manufacturers, Inc.	1407 Broadway, New York, NY 10018.
VSV	Valentine Sugars, Inc------------------------	726 Whitney Bldg., New Orleans, LA 70130.
VLN	Valley Nitrogen Producers, Inc---------------	1221 Van Ness Ave., Fresno, CA 93717.
MNP	The Valspar Corp-----------------------------	1101 S. 3d St., Minneapolis, MN 55415.
VNC	Vanderbilt Chemical Corp---------------------	31 Taylor Ave., Bethel, CT 06801 and Rt. 5 - Box 54, Murray, KY 42071.
VND	Van Dyk & Co., Inc---------------------------	Main & Williams Sts., Belleville, NJ 07109.
VEL	Velsicol Chemical Corp-----------------------	341 E. Ohio St., Chicago, IL 60611.
MHI	Ventron Corp---------------------------------	12-16 Congress St. Beverly, MA 01915.
VTC	Vicksburg Chemical Co. Div. of Vertac Consolidated.	P. O. Box 3, Vicksburg, MS 39180.
VIK	Viking Chemical Co---------------------------	838 Baker Bldg., Minneapolis, MN 55402.
VIN	Vineland Chemical Co. & Corp-----------------	W. Wheat Rd., Vineland, NJ 08360.
VCC	Vinings Chemical Co--------------------------	2555 Cumberland Pkwy., Suite 200, Atlanta, GA 30339.
VGC	Virginia Chemicals, Inc----------------------	3340 W. Norfolk Rd., Portsmouth, VA 23703.
SOH	Vistron Corp---------------------------------	393 Midland Bldg., Cleveland, OH 44115.
SIC	Silmar Div-----------------------------------	12333 S. Van Nesa Ave., Hawthorne, CA 90250.
VTM	Vitamins, Inc--------------------------------	200 E. Randolph Dr., Chicago, IL 60601.
FRO	Vulcan Materials Co., Chemicals Div----------	P. O. Box 7689, Birmingham, AL 35223.
WJ	Warner-Jenkinson Manufacturing Co------------	2526 Baldwin St., St. Louis, MO 63106.
WAG	West Agro-Chemical, Inc----------------------	501 Santa Fe, Kansas City, MO 64108.
WCA	West Coast Adhesives Co----------------------	11104 NW. Front Ave., Portland, OR 97231.
EW	Westinghouse Electric Corp., Industrial Plastics Div., Chemical Products Plant.	Manor, PA 15665.
WVA	Westvaco Corp., Polychemicals Dept-----------	P. O. Box 5207, N. Charleston, SC 29406.
WRD	Weyerhaeuser Co------------------------------	118 S. Palmetto Ave., Marshfield, WI 54449.
WBG	White & Bagley Co----------------------------	P. O. Box 706, Worcester, MA 01613.
WHI	White & Hodges, Inc--------------------------	576 Lawrence St., Lowell, MA 01853.
WHL	Whitmoyer Laboratories, Inc------------------	19 N. Railroad St., Myerstown, PA 17067.
APT	Whittaker Corp., Whittaker Coatings & Chemicals, Mol Rez Resins.	3134 California St., NE., Minneapolis, MN 55418.
WHW	Whittemore-Wright Co., Inc-------------------	62 Alford St., Charlestown, MA 02129.
WLN	Wilmington Chemical Corp---------------------	P. O. Box 66, Wilmington, DE 19899.
WTC	Witco Chemical Co., Inc----------------------	P. O. Box 305, Paramus, NJ 07652.
WAW	W. A. Wood Co--------------------------------	108 Spring St., Everett, MA. 02149.
WBC	Worthington Biochemical Corp-----------------	Halls Mill Rd., Freehold, NJ 07728.
WYC	Wycon Chemical Co----------------------------	5 Greenway Plaza East, Houston, TX 77046.
WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.	P. O. Box 831, Paoli, PA 19301.

U.S. IMPORTS OF BENZENOID CHEMICALS AND PRODUCTS

U.S. general imports of benzenoid chemicals and products entered under the Tariff Schedules of the United States (TSUS), schedule 4, part 1, subparts B and C are analyzed by the U.S. International Trade Commission annually and published in detail in a separate report.[1] General imports of benzenoid items entered in parts 1B and 1C totaled 362.4 million pounds with a foreign invoice value of $493.8 million in 1976 compared with 337.2 million pounds with a foreign invoice value of $394.3 million in 1975.

Benzenoid products that are "competitive" with similar domestic products, because they accomplish results substantially equal to those accomplished by the similar domestic product when used in substantially the same manner, are subject to a special basis of valuation for customs purposes known as the "American selling price". If "noncompetitive", the benzenoid products are valued for customs purposes on the basis of the "United States value." The essential difference between these two values is that "American selling price" is based on the wholesale price in the United States of the "competitive" domestic product, whereas "United States value" is based on the wholesale price in the United States of the imported product less most of the expenses incurred in bringing the product to the United States and selling it. When neither of these two valuation bases applies, then the "export value," "foreign value," or "constructed value" is used as the valuation basis under section 402 or 402a Tariff Act of 1930, as amended. The competitive status of benzenoid imports in 1976 is shown in table 2.

Industrial organic chemicals that are entered under part 1B consist chiefly of benzenoid intermediates and small quantities of acyclic compounds which are derived in whole or in part from benzenoid compounds. Also included are mixtures and small quantities of finished products not specially provided for in part 1C (e.g., rubber-processing chemicals). In terms of value, 36.6 percent of all the benzenoid imports under part 1B in 1976 came from West Germany; 21.0 percent, from Japan; 10.8 percent from Italy; and 7.8 percent, from the United Kingdom.

Finished organic chemical products entered under part 1C include dyes, pigments, medicinals, flavor and perfume materials, pesticides, plastics materials, and certain other specified products. In terms of value 36.0 percent of all finished benzenoid imports under part 1C in 1976 came from West Germany; 15.7 percent, from Switzerland; 13.4 percent, from the United Kingdom; and 10.7 percent, from Japan.

---

[1] *Imports of Benzenoid Chemicals and Products, 1976,* TC Publication 828, 1977.

APPENDIX

TABLE 2.--Benzenoid chemicals and products: Summary of U.S. general imports entered under Schedule 4, Parts 1B and 1C of the TSUS, and analysis by competitive status, 1976

Part and competitive status	Number of items	Quantity	Percent of total quantity	Foreign invoice value	Percent of foreign value	Unit foreign value
		1,000 pounds		*1,000 dollars*		*Per pound*
Schedule 4, Part 1B						
Total[1]	752	227,572	100.0	183,026	100.0	$0.80
Competitive:						
Duty based on ASP[2]	358	197,460	86.8	121,248	66.2	.61
Noncompetitive:						
Duty based on U.S. value	244	17,103	7.5	30,341	16.6	1.77
Duty based on export value	146	9,554	4.2	27,371	15.0	2.86
Competitive status not available	4	3,454	1.5	4,065	2.2	1.18
Schedule 4, Part 1C						
Total[1]	2,003	134,847	100.0	310,817	100.0	2.30
Competitive:						
Duty Based on ASP[2]	740	69,517	51.6	114,574	36.9	1.65
Noncompetitive:						
Duty based on U.S. value	1,038	27,708	20.5	90,882	29.2	3.28
Duty based on export value	219	34,850	25.8	97,487	31.4	2.80
Competitive status not available	6	2,772	2.1	7,875	2.5	2.84
Summary (Schedule 4, Parts 1B and 1C)						
Total[1]	2,755	362,419	100.0	493,843	100.0	1.36
Competitive:						
Duty based on ASP[2]	1,098	266,977	73.7	235,822	47.8	.88
Noncompetitive:						
Duty based on U.S. value	1,282	44,811	12.4	121,223	24.5	2.71
Duty based on export value	365	44,404	12.2	124,858	25.3	2.81
Competitive status not available	10	6,226	1.7	11,940	2.4	1.92

[1] Detail may not add to total due to rounding.
[2] American selling price.

Source: Compiled by the U.S. International Trade Commission from records of the U.S. Bureau of Customs.

Note:--The totals shown in this table differ from those given in the official statistics of the U.S. Department of Commerce chiefly because of differences in coverage and in the methods used in compiling the data. In general, the statistical coverage in 1976 varies from a low of 51 percent for flavors and perfumes, to about 84 percent coverage of 84 percent dyes, 80 percent intermediates, and 78 percent pigments.

TABLE 3.--CYCLIC INTERMEDIATES: GLOSSARY OF SYNONYMOUS NAMES

Common name	Standard (Chemical Abstracts) name
1,2,4-Acid	4-Amino-3-hydroxy-1-naphthalenesulfonic acid.
Acid yellow 9	6-Amino-3,4'-azodibenzenesulfonic acid.
p-Aminobenzenesulfonic acid	Sulfanilic acid and salt.
Amino G acid	7-Amino-1,3-naphthalenedisulfonic acid.
Amino 1 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.
Benzal chloride	α,α-Dichlorotoluene.
Benzanthrone	7H-Benz[de]anthracen-7-one.
Benzotrichoride	α,α,α,-Trichlorotoluene.
Bisphenol A	4,4'-Isopropylidenediphenol.
B.O.N	3-Hydroxy-2-naphthoic acid.
Bromobenzanthrone	3-Bromo-7H-benz[de]anthracene-7-one.
Broenner's acid	6-Amino-2-naphthalenesulfonic acid.
C acid	3-Amino-1,5-naphthalenedisulfonic acid.
Chlorobenzanthrone	Chloro-7H-benz[de]anthracen-7-one.
Chromotropic acid	4,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Chrysazin	1,8-Dihydroxyanthraquinone.
2-Cyanopyridine	Picolinonitrile.
3-Cyanopyridine	Nicotinonitrile.
Cyanuric chloride	2,4,6-Trichloro-s-triazine.
DADI	Dianisidine diisocyanate.
DBB	p-Dibutoxybenzene.
Decacyclene	Diacenaphtho[1,2-j:1,2'-ℓ]fluoranthene.
Developer Z	3-Methyl-1-phenyl-2-pyrazolin-5-one.
o-Dianisidine	3,3'-Dimethoxybenzidine.
1,1'-Dianthrimide	1,1'-Iminodianthraquinone.
Dibenzanthrone	Violanthrone.
4,4'-Dihydroxydiphenylsulfone	4,4'-Sulfonyldiphenol.
Dimethyl POPOP	1,4-Bis[2-(4-methyl-5-phenyloxazolyl)]benzene.
4,5-Dinitrochrysazin	1,8-Dihydroxy-4,5-dinitroanthraquinone.
Durene	1,2,4,5-Tetramethylbenzene.
Fast Red G base	2-Nitro-p-toluidine [NH_2=1].
Fast Scarlet R base	5-Nitro-o-anisidine [NH_2=1].
G salt	7-Hydroxy-1,3-naphthalenedisulfonic acid.
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.
Hellimellitene	1,2,3-Trimethylbenzene.
J acid	7-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
J acid urea	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid].
Koch's acid	8-Amino-1,3,6-napthalenetrisulfonic acid.
MEP	5-Ethyl-2-picoline
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.

TABLE 3.--Cyclic intermediates: Glossary of synonymous names--Continued

Common name	Standard (Chemical Abstracts) name
Naphthionic acid	4-Amino-1-naphthalenesulfonic acid.
o-Naphthionic acid	1-Amino-2-naphthalenesulfonic acid.
β-Naphthol	2-Naphthol, tech.
Naphthol AS	3-Hydroxy-2-naphthanilide.
α-Naphthylamine	1-Naphthylamine.
Neville & Winther's acid	4-Hydroxy-1-naphthalenesulfonic acid.
Pentaanthrimide	1,4,5,8-Tetrakis(1-anthraquinonylamino)anthraquinone.
Phenylbiphenyl	Terphenyl.
N-Phenyldiethanolamine	2,2'-[(Phenyl)imino]diethanol.
Phenyl J acid	7-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl peri acid	8-Anilino-1-naphthalenesulfonic acid.
POPOP	1,4-Bis[2-(5-phenyloxazolyl)]benzene.
Pseudocumene	1,2,4-Trimethylbenzene.
Pyrazoleanthrone	Anthra[1,9 cd]pyrazol-6(2H)-one.
Pyrazoleanthrone yellow	[3,3'-Bianthra[1,9-cd]pyrazole]-6,6'-(2H,2'H)dione.
Pyrazolone T	5-Oxo-1-(p-sulfophenyl)-2-pyrazoline-3-carboxylic acid.
Quinizarin	1,4-Dihydroxyanthraquinone.
2-Quinizarinsulfonic acid	9,10-Dihydro-1,4-dihydroxy-9,10-dioxo-2-anthracenesulfonic acid.
Quinoline yellow base	Quinophthalone.
R salt	3-Hydroxy-2,7-naphthalenedisulfonic acid, disodium salt.
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.
o-Sulfobenzaldehyde	o-Formylbenzenesulfonic acid.
Thiosalicylic acid	o-Mercaptobenzoic acid.
Tobias acid	2-Amino-1-naphthalenesulfonic acid.
TODI	Bitolylene diisocyanate.
o-Tolidine	3,3'-Dimethylbenzidine.
α-Toluic acid	Phenylacetic acid.
α-Tolunitrile	Phenylacetonitrile.
4-m-Tolylenediamine	Toluene-2,4-diamine.
Trimellitic anhydride	1,2,4-Benzenetricarboxylic acid, 1,2-anhydride.
Trimethyl base	1,3,3-Trimethyl-2-methyleneindoline.
Trinitrophenol	Picric acid.
Vinyltoluene	ar-Methylstyrene.

U. S. GOVERNMENT PRINTING OFFICE : 1977 O - 245-856

Library Cataloging Data

U.S. International Trade Commission.
Synthetic organic chemicals, United States production and sales, 1976. Washington, U.S. Govt. Print. Off., 1977.

298 p. A-356. illus. 27 cm.
(USITC Publication 833)

1. Coal-tar products. 2. Petroleum industry and trade--U.S. 3. Intermediates. 4. Dyes and dyeing. 5. Drugs. 6. Flavoring essences. 7. Plastics industry and trade--U.S. 8. Rubber industry and trade. 9. Elastomers. 10. Cleaning compounds. 11. Pesticides. 12. Chemicals--Manufacture and industry--U.S.--Directories. I. Title.