


**ITC SYNTHETIC ORGANIC CHEMICALS**

United States Production  
and Sales, 1981

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**SYNTHETIC  
ORGANIC CHEMICALS**

**United States Production  
and Sales, 1981**

**U.S. GOVERNMENT PRINTING OFFICE  
WASHINGTON: 1982**

**USITC PUBLICATION 1292**

**UNITED STATES INTERNATIONAL TRADE COMMISSION**

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## INTRODUCTION

This is the 65th 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 for chemical conversion; cyclic intermediates; dyes; organic pigments; medicinal chemicals; flavor and perfume materials; plastics and resin materials; rubber-processing chemicals; elastomers; plasticizers; surface-active agents; pesticides and related products; miscellaneous end-use chemicals and chemical products; and miscellaneous cyclic and acyclic chemicals. Data have been supplied by approximately 780 producers.

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

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

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

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

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

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

Table 2 of the Appendix summarizes U.S. general imports in 1981 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 synonymous names of the organic chemicals included in this report may be found in the *SOCMA Handbook: Commercial Organic Chemical Names*, published by the Chemical Abstracts Service of the American Chemical Society, or the *Colour Index* (Revised Third Edition), published jointly by the Society of Dyes and Colourists and the American Association of Textile Chemists and Colorists.

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

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

*PRODUCTION is the total quantity of a commodity made available by ORIGINAL MANUFACTURERS ONLY within the customs territory of the United States (includes the 50 States, the District of Columbia, and Puerto Rico). It covers synthetic organic chemicals, specified crudes from petroleum and coal tar, and certain chemically described natural products, such as, alkaloids, enzymes, and perfume isolates. It is the sum--expressed in terms of 100% active ingredient unless otherwise specified in the reporting instructions--of the quantities:*

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

<sup>1</sup>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, the company, unless inclusion of such processing is specifically requested in the reporting instructions for individual sections;  
 Intermediate products which are formed in the manufacturing process, but are not isolated from the reaction system—that is, not weighed, analyzed, or otherwise measured; except such products as described above as being produced and not isolated, but directly converted to a finished or semifinished item.  
 Materials that are used in the process but which are recovered for re-use or sale;  
 Waste products having no economic significance.

SALES are actual quantities of commodities sold by ORIGINAL MANUFACTURERS ONLY. Sales include the quantity and value of:

Shipments of a commodity for domestic use or for export, or segregation in a warehouse when title has passed to the purchaser in a bona fide sale;  
 Shipments of a commodity produced for you by others under toll agreement;  
 Shipments to subsidiary or affiliated companies, provided the ownership is less than 100%.

SALES 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 commodity produced for others under toll agreements.

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

Combined production of all synthetic organic chemicals, tar, and primary products from petroleum and natural gas in 1981 was 331,147 million pounds—a decrease of 2.5 percent from the output in 1980 (table 1). Sales of these materials in 1981, which totaled 176,272 million pounds, valued at \$63,637 million, were 2.7 percent smaller than in 1980 in terms of quantity and 5.3 percent larger in terms of value. These figures include data on production and sales of chemicals measured at several successive steps in the manufacturing process, and, therefore, they necessarily reflect some duplication.

In 1981, production of all synthetic organic chemicals, including cyclic intermediates and finished products totaled 217,340 million pounds, or 1.0 percent more than the output in 1980. Eight sections showed an increase in production in 1981 over 1980. Organic pigments (76 million pounds) increased by 10.1 percent; plastics and resin materials (40,601 million pounds) increased by 6.3 percent; plasticizers (1,866 million pounds) increased by 4.6 percent; surface-active agents (5,078 million pounds) increased by 4.6 percent; elastomers (4,849 million pounds) increased by 1.7 percent; miscellaneous cyclic and acyclic chemicals (95,039 million pounds) increased by 0.7 percent; cyclic intermediates (45,323 million pounds) increased by 0.6 percent; and medicinal chemicals (245 million pounds) increased by 0.4 percent. The remaining sections showed a decrease in production in 1981 from that in 1980. Dyes (230 million pounds) and miscellaneous end-use chemicals and chemical products (22,158 million pounds) led the decrease with a loss of 6.1 percent; flavor and perfume materials (165 million pounds) decreased 5.7 percent; rubber-processing chemicals (280 million pounds) decreased 3.8 percent; and pesticides and related products (1,430 million pounds) decreased 2.6 percent.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS AND THEIR RAW MATERIALS: U.S.  
PRODUCTION AND SALES, 1980 AND 1981

CHEMICAL	PRODUCTION			SALES					
	1980	1981	INCREASE: OR DECREASE: (-),1981	QUANTITY		VALUE			
				1980	1981	INCREASE: OR DECREASE: (-),1981	1980	1981	INCREASE: OR DECREASE: (-),1981
	Million pounds	Million pounds	Percent	Million pounds	Million pounds	Percent	Million dollars	Million dollars	Percent
Grand total <sup>2</sup> -----	339,723	331,147	-2.5	181,188	176,272	-2.7	60,444	63,637	5.3
Tar-----	4,366	4,290	-1.7	3,128	2,749	-12.1	...	555	...
Primary products from petroleum and natural gas-----	120,232	109,517	-8.9	64,292	59,222	-7.9	10,646	10,369	-2.6
Synthetic organic chemicals, total <sup>2</sup> -----	215,125	217,340	1.0	113,768	114,301	0.5	49,798	52,713	5.9
Cyclic intermediates-----	45,070	45,323	0.6	20,060	19,202	-4.3	7,248	7,437	2.6
Dyes-----	245	230	-6.1	227	219	-3.5	791	773	-2.3
Organic pigments-----	69	76	10.1	61	64	4.9	361	415	15.0
Medicinal chemicals-----	244	245	0.4	167	153	-8.4	1,153	1,199	4.0
Flavor and perfume materials-----	175	165	-5.7	129	119	-7.8	254	252	-0.8
Plastics and resin materials-----	38,186	40,601	6.3	33,550	36,107	7.6	16,011	17,092	6.8
Rubber-processing chemicals-----	291	280	-3.8	194	182	-6.2	296	298	0.7
Elastomers (synthetic rubber)-----	<sup>3</sup> 4,770	4,849	1.7	<sup>3</sup> 2,528	3,256	-0.1	<sup>5</sup> 2,280	2,505	9.9
Plasticizers-----	1,784	1,866	4.6	1,574	1,567	-0.4	858	894	4.2
Surface-active agents-----	4,853	5,078	4.6	2,928	3,104	6.0	1,296	1,477	14.0
Pesticides and related products-----	1,468	1,430	-2.6	1,406	1,291	-8.2	4,078	4,652	14.1
Miscellaneous end-use chemicals and chemical products-----	23,602	22,158	-6.1	14,075	12,954	-8.0	3,499	3,975	13.6
Miscellaneous cyclic and acyclic chemicals-----	94,368	95,039	0.7	36,139	36,083	-0.2	11,672	11,744	0.6

<sup>1</sup>Percentages calculated from figures rounded to thousands.

<sup>2</sup>Because of rounding, figures may not add to the totals shown.

<sup>3</sup>Estimated by using data from the 1981 U.S. Industrial Outlook, p. 179.

<sup>4</sup>Estimated by using the ratio of sales quantity as compared with production for elastomers in 1979.

<sup>5</sup>Value was computed by using the average price indexes for 1979 and 1980 which came from the Producers Prices and Prices Indexes for July 1980 and the Producers Prices and Prices Indexes for March 1981, pages 65 and 77, respectively.



## SYNTHETIC ORGANIC CHEMICALS, 1981

## GENERAL

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

Total production of synthetic organic chemicals (intermediates and finished products combined) in 1981 was 217,339 million pounds or 3.3 percent more than the output of 210,356 million pounds reported for 1980, and 107.6 percent more than the output of 104,711 million pounds reported in 1967 (see table 2). Sales of synthetic organic chemicals in 1981 amounted to 114,299 million pounds, valued at \$52,713 million, compared with 110,510 million pounds, valued at \$47,518 million, in 1980 and 55,177 million pounds, valued at \$10,438 million, in 1967. Production of all cyclic products (intermediates and finished products combined) in 1981 totaled 70,334 million pounds or 5.2 percent more than the 66,834 million pounds reported for 1980 and 110.1 percent more than the 33,479 million pounds reported for 1967; however, the transfer of eight items, in 1979 from the primary products from petroleum and natural gas section to the section on cyclic intermediates has caused the output of cyclic products to appear much higher in relation to 1967 than would otherwise have resulted. Production of all acyclic products in 1981 totaled 147,006 million pounds, or 2.4 percent more than the 143,523 million pounds reported for 1980 and 106.4 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, 1980, AND 1981

(Production and sales in thousands of pounds; sales value in thousands of dollars)						
CHEMICAL	1967 <sup>1</sup>	1980	1981	INCREASE OR DECREASE (-)		
				1981 OVER 1980	1981 OVER 1967	
Organic chemicals, cyclic and cyclic, grand total:				Percent	Percent	
Production-----	104,711,357	210,356,473	217,339,092	107.6	3.3	
Sales-----	55,176,823	110,509,967	114,298,750	107.1	3.4	
Sales value-----	10,438,453	47,518,404	52,712,854	405.0	11.0	
Cyclic, total:						
Production-----	33,479,469	66,833,907	70,333,502	110.1	5.2	
Sales-----	19,328,628	35,045,536	36,546,767	89.1	4.3	
Sales value-----	4,610,293	22,265,859	24,067,541	422.0	8.1	
Acyclic, total:						
Production-----	71,231,888	143,522,566	147,005,590	106.4	2.4	
Sales-----	35,848,195	75,464,431	77,751,983	116.9	3.0	
Sales value-----	5,828,160	25,252,545	28,645,313	391.5	13.4	
1. Cyclic Intermediates						
Production-----	20,793,132	45,069,670	45,323,048	118.0	0.6	
Sales-----	9,461,180	20,060,375	19,201,715	103.0	-4.3	
Sales value-----	1,000,359	7,248,265	7,436,562	643.4	2.6	
2. Dyes						
Production-----	206,240	245,348	229,670	11.4	-6.4	
Sales-----	198,592	227,448	218,848	10.2	-3.8	
Sales value-----	332,049	790,664	772,837	132.7	-2.3	
3. Organic Pigments						
Production-----	53,322	69,373	75,795	42.1	9.3	
Sales-----	42,867	60,771	64,067	49.5	5.4	
Sales value-----	108,354	361,334	415,320	283.3	14.9	
4. Medicinal Chemicals						
Cyclic:						
Production-----	110,129	174,597	180,260	63.7	3.2	
Sales-----	70,120	102,606	100,204	42.9	-2.3	
Sales value-----	348,873	1,095,950	1,144,400	228.0	4.4	
Acyclic:						
Production-----	69,941	69,279	64,422	-7.9	-7.0	
Sales-----	56,804	64,625	53,226	-6.3	-17.6	
Sales value-----	36,402	56,844	54,292	49.1	-4.5	

## GENERAL

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TABLE 2.--SYNTHETIC ORGANIC CHEMICALS: SUMMARY OF U.S. PRODUCTION AND SALES OF INTERMEDIATES AND FINISHED PRODUCTS, 1967, 1980, AND 1981--CONTINUED

CHEMICAL	(Production and sales in thousands of pounds; sales value in thousands of dollars)				INCREASE OR DECREASE (-)	
	1967 <sup>1</sup>	1980	1981	1981 OVER 1967	1981 OVER 1980	
				Percent	Percent	
<i>5. Flavor and Perfume Materials</i>						
Cyclic:						
Production-----	57,978	97,791	93,136	60.6	-4.8	
Sales-----	47,285	73,760	68,673	45.2	-6.9	
Sales value-----	52,866	156,794	157,708	198.3	0.6	
Acyclic:						
Production-----	53,558	76,911	71,427	33.4	-7.1	
Sales-----	49,311	55,238	49,879	1.2	-9.7	
Sales value-----	40,495	96,726	93,887	131.8	-2.9	
<i>6. Plastics and Resin Materials</i>						
Cyclic:						
Production-----	5,033,497	11,753,214	11,729,680	133.0	-0.2	
Sales-----	4,224,121	9,606,419	10,470,900	147.9	9.0	
Sales value-----	1,036,940	6,316,455	6,836,908	559.3	8.2	
Acyclic:						
Production-----	8,759,452	26,432,776	28,871,340	229.6	9.2	
Sales-----	7,753,242	23,944,008	25,635,651	230.6	7.1	
Sales value-----	1,635,690	9,694,713	10,255,361	527.0	5.8	
<i>7. Rubber-Processing Chemicals</i>						
Cyclic:						
Production-----	220,139	258,300	246,268	11.9	-4.7	
Sales-----	169,970	167,854	157,591	-7.3	-6.1	
Sales value-----	116,318	269,905	270,934	132.9	0.4	
Acyclic:						
Production-----	43,994	33,130	33,360	-24.2	0.7	
Sales-----	30,878	26,071	23,949	-22.4	-8.1	
Sales value-----	15,477	26,047	27,419	77.2	5.3	
<i>8. Elastomers (Synthetic Rubber)</i>						
Cyclic:						
Production-----	2,297,637	...	2,487,145	8.2	...	
Sales-----	1,940,099	...	1,552,530	-20.0	...	
Sales value-----	439,580	...	848,554	93.0	...	
Acyclic:						
Production-----	1,524,908	...	2,362,312	54.9	...	
Sales-----	1,321,945	...	1,703,302	28.8	...	
Sales value-----	434,657	...	1,656,542	281.1	...	
<i>9. Plasticizers</i>						
Cyclic:						
Production-----	929,871	1,388,935	1,458,323	56.8	5.0	
Sales-----	865,084	1,219,999	1,208,976	39.8	-0.9	
Sales value-----	167,827	608,372	622,474	270.9	2.3	
Acyclic:						
Production-----	332,908	395,505	407,216	22.3	3.0	
Sales-----	296,767	353,589	357,527	20.5	1.1	
Sales value-----	93,142	250,018	271,159	191.1	8.5	
<i>10. Surface-Active Agents</i>						
Cyclic: <sup>2</sup>						
Production-----	1,418,444	1,154,101	1,229,201	-13.3	6.5	
Sales-----	852,238	616,824	665,700	-21.9	7.9	
Sales value-----	95,810	339,708	366,860	282.9	8.0	
Acyclic:						
Production-----	2,060,851	3,698,583	3,849,007	86.8	4.1	
Sales-----	897,786	2,310,680	2,438,593	171.6	5.5	
Sales value-----	220,877	956,552	1,109,659	402.4	16.0	

See footnotes at end of table.

## SYNTHETIC ORGANIC CHEMICALS, 1981

TABLE 2.--SYNTHETIC ORGANIC CHEMICALS: SUMMARY OF U.S. PRODUCTION AND SALES OF INTERMEDIATES AND FINISHED PRODUCTS, 1967, 1980, AND 1981--CONTINUED

CHEMICAL	(Production and sales in thousands of pounds; sales value in thousands of dollars)				INCREASE OR DECREASE (-)	
	1967 <sup>1</sup>	1980	1981	1981 OVER 1967	1981 OVER 1980	
				Percent	Percent	
<b>11. Pesticides and Related Products</b>						
Cyclic:						
Production-----	823,158	1,054,309	1,012,429	23.0	-4.0	
Sales-----	681,532	1,017,006	907,365	33.1	-10.8	
Sales value-----	627,742	3,079,575	3,503,886	458.2	13.8	
Acyclic:						
Production-----	226,505	413,893	417,646	84.4	0.9	
Sales-----	215,831	389,315	383,276	77.6	-1.6	
Sales value-----	159,301	998,923	1,148,496	621.0	15.0	
<b>12. Miscellaneous End-Use Chemicals and Chemical Products<sup>3</sup></b>						
Cyclic:						
Production-----	( 1,535,922)	3,680,087	3,887,814	153.1	5.6	
Sales-----	( 775,540)	855,764	867,742	11.9	1.4	
Sales value-----	( 283,575)	577,347	701,512	147.4	21.5	
Acyclic:						
Production-----	(58,159,771)	19,922,403	18,270,464	-68.6	-8.3	
Sales-----	(25,225,631)	13,218,867	12,086,173	-52.1	-8.6	
Sales value-----	( 3,192,119)	2,922,055	3,273,682	2.6	12.0	
<b>13. Miscellaneous Cyclic and Acyclic Chemicals<sup>3</sup></b>						
Cyclic:						
Production-----	...	1,888,182	2,380,733	...	26.1	
Sales-----	...	1,036,710	1,062,456	...	2.5	
Sales value-----	...	1,421,490	989,586	...	-30.4	
Acyclic:						
Production-----	...	92,480,086	92,658,396	...	0.2	
Sales-----	...	35,102,038	35,020,407	...	-0.2	
Sales value-----	...	10,250,667	10,754,816	...	4.9	

<sup>1</sup>Standard reference base period for Federal Government general-purpose index numbers.<sup>2</sup>Includes ligninsulfonates.<sup>3</sup>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 1981 of one or more of the chemicals included in the groups listed in table 2:

Chemical group	Number of companies	Chemical group	Number of companies
Cyclic intermediates-----	194	Elastomers (synthetic rubber)-----	26
Dyes-----	37	Plasticizers-----	52
Organic pigments-----	36	Surface-active agents-----	176
Medicinal chemicals-----	89	Pesticides and related products-----	85
Flavor and perfume materials-----	39	Miscellaneous end-use chemicals and chemical products-----	151
Plastics and resin materials-----	264	Miscellaneous cyclic and acyclic chemicals-----	282
Rubber-processing chemicals-----	28		



## STATISTICAL HIGHLIGHTS

Cynthia B. Foreso

## TAR

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 coal tar produced in the United States in 1981 amounted to 472 million gallons (table 1). Production in 1981 was 12 percent less than the 534 million gallons of coal tar produced in 1980. Sales of coal tar in 1981 amounted to 362 million gallons, compared with 325 million gallons in 1980. U.S. production of water-gas and oil-gas tars was not reported to the Commission for 1980 or 1981; production of these tars in 1968 amounted to 21 million gallons, according to trade publications.

## 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 tables 1 and 1B.

Domestic production of industrial and specification grades of benzene reported by coke-oven operators and petroleum refiners in 1981 amounted to 1,339 million gallons--16 percent less than the 1,585 million gallons reported for 1980. These statistics include data for benzene produced from light oil and petroleum. Sales of benzene by coke-oven operators and petroleum refiners in 1981 amounted to 688 million gallons, compared with 1,147 million gallons in 1980. In 1981, the output of toluene (including material produced for use in blending in aviation fuel) amounted to 856 million gallons--16 percent less than the 1,017 million gallons reported for 1980. Sales of toluene (Nitration grade 1°) in 1981 were 608 million gallons, compared with 677 million gallons in 1980. The output of xylene in 1981 (including that produced for blending in motor fuels) was 882 million gallons, compared with 909 million gallons in 1980. Sales of xylene decreased slightly to 381 million gallons in 1981, compared with 443 million gallons in 1980.

Production of crude naphthalene from coal-tar oils in 1981 amounted to 358 million pounds; however, sales figures could not be published without disclosing the operations of individual companies. Production of petroleum-derived naphthalene in 1981 amounted to 142 million pounds, compared with 103 million pounds in 1980. Production figures on road tar for 1981 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 1981 tar crudes were supplied by 20 companies and company divisions.

TABLE 1.--TAR AND TAR CRUDES: U.S. PRODUCTION AND SALES, 1981

[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.]

TAR AND TAR CRUDES	UNIT OF QUANTITY	PRODUCTION	SALES		
			QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
				1,000	
				dollars	
Coal tar: <sup>2</sup> Coke-oven operators-----	1,000 gal--	472,181	362,164	296,974	\$0.82
Crude light oil: <sup>3</sup> Coke-oven operators-----	1,000 gal--	146,950	118,805	136,626	1.15
Intermediate light oil: <sup>3</sup> Coke-oven operators----	1,000 gal--	4,163	131	176	1.34
Light-oil distillates:					
Benzene, all grades, total <sup>4</sup> -----	1,000 gal--	1,339,160	687,625	1,180,395	1.72
Coke-oven operators-----	1,000 gal--	31,429	31,990	53,729	1.68
Petroleum refiners <sup>5</sup> -----	1,000 gal--	1,307,731	655,635	1,126,666	1.72
Toluene, all grades, total <sup>4</sup> -----	1,000 gal--	856,465	608,251	767,941	1.26
Coke-oven operators-----	1,000 gal--	4,829	5,151	6,892	1.34
Petroleum refiners-----	1,000 gal--	851,636	603,100	761,049	1.26
Xylene, all grades, total <sup>4</sup> -----	1,000 gal--	882,408	381,040	563,250	1.48
Coke-oven operators-----	1,000 gal--	657	626	897	1.43
Petroleum refiners-----	1,000 gal--	881,751	380,414	562,353	1.48
Naphthalene, crude, total-----	1,000 lb---	358,334	...	...	...
Solidifying at:					
Less than 74° C-----	1,000 lb---	6,961	6,162	25,264	4.10
74° C to less than 79° C-----	1,000 lb---	351,373	...	...	...
Creosote oil (Dead oil) (100% creosote basis):					
Distillate as such (100% creosote basis)-----	1,000 gal--	81,902	61,493	31,584	.51
Creosote in coal tar solution (100% solution basis)-----	1,000 gal--	61,120	44,460	43,745	.98
Tar, refined, for uses other than road tar-----	1,000 gal--	11,022	7,164	9,661	1.35
Pitch of tar <sup>6</sup> -----	1,000 tons-	19,199	1,176	234,434	199.35

<sup>1</sup>Unit value per gallon, pound, or ton as specified.

<sup>2</sup>Includes only data for coal tar reported to the Office of Energy Data and Interpretation, Energy Information Administration, Department of Energy (Energy Data Reports, Coke Plant Report, quarterly, October-December, 1981, May 27, 1982). 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.

<sup>3</sup>Data reported by tar distillers are not included because publication would disclose the operations of individual companies. At date of publication, sales values for coke-oven operators were not available.

<sup>4</sup>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.

<sup>5</sup>Benzene, specification grades (1°, 2°).

<sup>6</sup>Includes soft, medium, and hard pitch of tar, and pitch emulsion.

Note 1.--Statistics for materials produced in coke and gas-retort ovens are compiled by the Office of Energy Data and Interpretation, Energy Information Administration, Department of Energy. Statistics for materials produced in tar and petroleum refineries are compiled by the U.S. International Trade Commission.

Note 2.--Data for all other tars and tar crudes are not included in the 1981 report because publication would disclose the operation of individual companies. Preliminary coke-oven operators' data were obtained from cumulative totals reported in Energy Data Reports, Coke Plant Report, quarterly, October-December, 1981, May 27, 1982.

TABLE 1A.--TAR: U.S. PRODUCTION AND CONSUMPTION, 1980 AND 1981

(In thousands of gallons)			
TAR	1980	1981	
PRODUCTION			
Coal tar from coke-oven byproduct plants, total <sup>1</sup> -----	534,068	472,181	
CONSUMPTION			
Total-----	( <sup>2</sup> )	( <sup>2</sup> )	
Tar consumed by distillation, total-----			
Coal tar distilled or topped by coke-oven operators <sup>1</sup> -----	( <sup>2</sup> )	( <sup>2</sup> )	
Coal tar and oil-gas tar distilled by tar distillers <sup>3</sup> -----	308,659	439,440	
Tar consumed by the producers chiefly as fuel <sup>1</sup> -----			
Coal tar consumed at coke-oven plants in miscellaneous uses <sup>1</sup> -----	( <sup>2</sup> )	( <sup>2</sup> )	

<sup>1</sup>Reported to the Office of Energy Data and Interpretation, Energy Information Administration, Department of Energy.

<sup>2</sup>Department of Energy data were not available at time of publication.

<sup>3</sup>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, 1980, AND 1981

TAR AND TAR CRUDES	UNIT OF QUANTITY	1967 <sup>1</sup>	1980	1981	INCREASE, OR DECREASE (-)	
					1981 : 1981	OVER : OVER
					Percent	Percent
Coal tar <sup>2</sup> -----	1,000 gal--	780,334	534,068	472,181	-40	-12
Benzene: <sup>3</sup>						
Coke-oven operators-----	1,000 gal--	90,642	50,781	31,429	-65	-38
Petroleum refiners-----	1,000 gal--	878,704	1,533,845	1,307,731	49	-15
Total-----	1,000 gal--	969,346	1,584,626	1,339,160	38	-16
Toluene: <sup>3</sup>						
Coke-oven operators-----	1,000 gal--	19,357	7,812	4,829	-75	-38
Petroleum refiners-----	1,000 gal--	624,454	1,009,509	851,636	36	-16
Total-----	1,000 gal--	643,811	1,017,321	856,465	33	-16
Xylene: <sup>3</sup>						
Coke-oven operators-----	1,000 gal--	5,488	1,364	657	-88	-52
Petroleum refiners-----	1,000 gal--	449,349	907,182	881,751	96	-3
Total-----	1,000 gal--	454,837	908,546	882,408	94	-3
Naphthalene:						
Crude <sup>3</sup> -----	1,000 lb--	520,991	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )
Petroleum naphthalenes, all grades-----	1,000 lb--	376,679	103,357	142,164	-62	38
Total-----	1,000 lb--	879,670	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )
Creosote oil (Dead oil): <sup>7</sup>						
Distillate as such (100% creosote basis)-----	1,000 gal--	108,832	60,648	81,902	-25	35
Creosote in coal tar solution (100% solution basis)-----	1,000 gal--	27,420	36,011	61,120	123	70
Creosote content of coal tar solution (100% creosote basis)-----	1,000 gal--	17,402	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )
Total-----	1,000 gal--	153,654	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )

<sup>1</sup>Standard reference base period for Federal Government general-purpose index numbers.

<sup>2</sup>Includes only data for coal tar reported to the Office of Energy Data and Interpretation, Energy Information Administration, Department of Energy.

<sup>3</sup>Data reported by tar distillers are not included because publication would disclose the operations of individual companies.

<sup>4</sup>Includes data for material produced for use in blending motor fuels. Statistics are not comparable with monthly figures which include some o-xylene.

<sup>5</sup>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."

<sup>6</sup>Statistics cannot be published; to do so would disclose the operations of individual companies.

<sup>7</sup>Includes data for creosote oil produced by tar distillers and coke-oven operators and used only in wood preservatives.

TABLE 2.--TAR CRUDES FOR WHICH U.S. PRODUCTION OR SALES WERE REPORTED,  
IDENTIFIED BY MANUFACTURERS, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED WITH AN ASTERISK (\*) 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]

TAR CRUDES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Light-oil distillates:	
*Benzene <sup>1</sup> , coke-oven operators-----	BTS, CLF, JLS, USS.
Solvent naphtha-----	BTS, CLF, IGC, USS.
*Toluene <sup>1</sup> , coke-oven operators-----	BTS, CLF, JLS, USS.
Xylene <sup>1</sup> , coke-oven operators-----	CLF, JLS, USS.
Pyridine, crude bases-----	KPT.
Naphthalene, crude, solidifying at:	
Less than 74° C-----	BTS, IGC, RSC, USS.
74° C to less than 79° C-----	ACS, KPT, USS.
Methylnaphthalene-----	KPT.
*Crude tar-acid oils: <sup>1</sup>	
Tar-acid content 5% to less than 24%-----	KPT.
Tar-acid, all other-----	USS.
Cresylic acid, crude-----	FER, KPT.
Creosote oil (Dead oil):	
*Distillate as such-----	ACS, COP, KPT, RIL, USS, WTC.
*Creosote in coal tar solution-----	ACS, KPT, RIL, USS, WTC.
All other distillate products:	
Carbon black oil-----	KPT.
Creosote tar acid oil-----	KPT.
Crude coal tar solvent-----	KPT.
Crude tetralin-----	KPT.
Priming and refractory oil-----	KPT.
All other-----	ACS, KPT.
Tar, road-----	ACS, NTS, RIL.
Tar for other uses:	
Crude-----	HUS, IGC, RSC, USS.
Refined-----	ACS, KPT, RIL.
*Pitch of tar:	
Soft (water softening point less than 110° F)-----	ACS, KPT, USS.
Medium (water softening point 110° F to 160° F)-----	ACS, COP, KPT, RIL, USS.
Hard (water softening point above 160° F)-----	KPT, RIL, USS, WTC.
Pitch emulsion-----	JEN.
Refined anthracene-----	ACS.

<sup>1</sup>Does not include manufacturers' identification codes for producers which report to the Office of Energy Data and Interpretation, Energy Information Administration, Department of Energy.

TABLE 3.--TAR AND TAR CRUDES: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of tar and tar crudes to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ACS	Allied Corp., Allied Chemicals Co.	KPT	Koppers Co., Inc.
ALF	Allied Corp.	NEV	Neville Chemical Co.
BTS	Bethlehem Steel Corp.	NTS	National Steel Corp., Great Lakes Plant
CLF	C. P. & I. Steel Corp.	RIL	Reilly Tar & Chemical Corp.
COP	Coopers Creek Chemical Corp.	RSC	Republic Steel Corp.
DHC	Donner-Hanna Coke Joint Venture	USS	U.S. Steel Corp.: Clairton Plant
FER	Ferro Corp., Productol Chemical Div.		Fairfield Plant
HUS	Husky Industries, Inc.		Gary Plant
IGC	Indiana Gas & Chemical Corp.	WTC	Witco Chemical Corp.
JEN	Jennison-Wright Corp.		
JLS	Jones & Laughlin Steel Corp.		

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





# SECTION II -- PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS 13 FOR CHEMICAL CONVERSION

## STATISTICAL HIGHLIGHTS

James Raftery

Primary products that are derived from petroleum and natural gas<sup>1</sup> 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 other chemicals are derived. In this report every effort has been made to exclude data on materials that are used as fuel; however, data are included on toluene and 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 109,517 million pounds in 1981. Production in 1980 was 117,137 million pounds. The output of aromatic and naphthenic products from petroleum amounted to 26,261 million pounds in 1981, compared with 29,521 million pounds in 1980. Sales amounted to \$2,758 million in 1981 and \$3,724 million in 1980. In 1981, production of benzene was 9,573 million pounds; production of toluene was 6,140 million pounds; and production of xylene was 6,701 million pounds (table 1).

Production of all aliphatic hydrocarbons and derivatives from petroleum and natural gas was 83,257 million pounds in 1981, compared with 87,615 million pounds in 1980. Sales of these products were valued at \$7,611 million in 1981, compared with \$6,922 million in 1980. Production of ethylene was 29,418 million pounds in 1981. The output of 1,3-butadiene in 1981 was 2,986 million pounds. Production of propylene in 1981 was 13,482 million pounds (table 1).

Data for 1981 primary products from petroleum and natural gas for chemical conversion were supplied by 78 companies or company division.

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





TABLE 1.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION: U.S. PRODUCTION AND SALES, 1981

[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]

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total-----	109,517,482	59,221,982	10,369,286	\$0.18
AROMATICS AND NAPHTHENES <sup>2</sup>				
Total-----	26,260,683	14,675,842	2,758,015	.19
Benzene (1° and 2°)-----	9,572,592	4,799,245	1,126,666	.23
Naphthalene, all grades-----	142,164	107,865	30,081	.28
Naphthenic acid-----	22,205	21,329	4,929	.23
Toluene, all grades, total-----	6,140,298	4,348,350	761,049	.18
Nitration grade, 1°-----	3,921,095	3,052,111	575,969	.19
Pure commercial grade, 2°-----	678,397	582,522	55,202	.09
All other <sup>3</sup> 4-----	1,540,806	713,717	129,878	.18
Xylenes, mixed, total-----	6,701,308	2,891,150	562,353	.19
3° grade-----	2,950,701	1,514,500	296,313	.20
5° grade-----	1,654,757	723,219	144,623	.20
All other <sup>4</sup> -----	2,095,850	653,431	121,417	.19
All other aromatics and naphthenes <sup>5</sup> -----	3,682,116	2,507,903	272,937	.11
ALIPHATIC HYDROCARBONS				
Total-----	83,256,799	44,546,140	7,611,271	.17
C <sub>2</sub> Hydrocarbons, total-----				
Acetylene <sup>6</sup> (For chemical use only)-----	278,494	87,464	44,387	.51
Ethane-----	6,297,256	2,524,723	240,129	.10
Ethylene-----	29,418,089	9,413,634	2,339,646	.25
C <sub>3</sub> Hydrocarbons, total-----				
Propane-----	7,865,044	7,354,548	812,494	.11
Propylene <sup>7</sup> -----	13,482,051	7,290,288	1,411,538	.19
C <sub>4</sub> Hydrocarbons, total-----				
Butadiene and butylene fractions-----	1,075,498	887,080	182,489	.21
1,3-Butadiene, grade for rubber (elastomers)-----	2,986,329	2,375,615	799,326	.34
n-Butane-----	1,719,310	792,493	92,125	.12
1-Butene-----	136,907	122,629	33,861	.28
1-Butene and 2-Butene, mixed <sup>8</sup> -----	562,003	...	...	...
Isobutane-----	1,058,387	517,331	63,503	.12
Isobutylene-----	1,034,553	435,404	96,530	.22
All other <sup>9</sup> -----	1,839,330	907,120	161,301	.18
C <sub>5</sub> Hydrocarbons, total-----				
Isoprene (2-Methyl-1,3-butadiene)-----	505,707	200,599	52,513	.26
n-Pentane-----	47,154	...	...	...
Pentenes, mixed-----	163,621	131,173	18,592	.14
Piperylene (1,3-Pentadiene)-----	50,138	47,992	8,513	.18
All other <sup>10</sup> 11-----	1,696,883	883,398	120,521	.14
All other aliphatic hydrocarbons, derivatives and mixtures, total-----				
Alpha olefins <sup>12</sup> -----	999,050	332,386	131,675	.40
tert-Butylmercaptan(2-methyl-2-propanethiol)-----	14,281	10,428	6,753	.65

See footnotes at end of table.

TABLE 1.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION: U.S. PRODUCTION AND SALES, 1981--CONTINUED

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
ALIPHATIC HYDROCARBONS--Continued				
All other aliphatic hydrocarbons, derivatives, and mixtures--Continued	1,000	1,000	1,000	Per pound
Dodecene (Tetrapropylene)-----	287,012	75,059	52,196	\$0.70
Heptenes, mixed-----	126,725	86,745	40,663	.47
Hexane-----	365,414	223,349	56,263	.25
Nonene (Tripropylene)-----	452,771	254,959	89,021	.35
n-Paraffins <sup>12</sup> -----	1,300,376	771,217	148,808	.19
Polybutene-----	339,699	196,265	60,837	.31
All other <sup>14</sup> -----	9,154,717	8,624,241	547,587	.06

<sup>1</sup>Calculated from rounded figures.

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

<sup>3</sup>Includes toluene, solvent grade, 90 percent.

<sup>4</sup>Includes toluene and xylene used as solvents; may include that which is blended in aviation and motor gasoline.

<sup>5</sup>Includes data for alkyl aromatics, crude cresylic acid, refined cresylic acid, polyethylbenzene, distillates, solvents and miscellaneous cyclic hydrocarbons.

<sup>6</sup>Production figures on acetylene from calcium carbide for chemical synthesis are collected by the U.S. Bureau of the Census.

<sup>7</sup>Includes data for refinery propylene.

<sup>8</sup>The statistics represent principally the butene content of crude refinery gases from which butadiene is manufactured.

<sup>9</sup>Includes data for butanes, mixed C<sub>4</sub> streams, 2-butene, and mixed butylenes.

<sup>10</sup>Includes data for isopentane, amylenes, dibutanized aromatic concentrate.

<sup>11</sup>Includes sales data only for n-pentane.

<sup>12</sup>Includes data for the following molecular weight ranges: C<sub>6</sub>-C<sub>7</sub>; C<sub>8</sub>-C<sub>10</sub>; C<sub>11</sub>-C<sub>15</sub>; C<sub>15</sub>-C<sub>20</sub>; and others.

<sup>13</sup>Includes data for the following chain lengths: C<sub>6</sub>-C<sub>9</sub>; C<sub>6</sub>-C<sub>16</sub>; C<sub>9</sub>-C<sub>15</sub>; C<sub>10</sub>-C<sub>14</sub>; C<sub>10</sub>-C<sub>16</sub>; and others.

<sup>14</sup>Includes production and/or sales data for methane, methyl acetylene propadiene, methylcyclopentadiene, n-heptane, n-octane, di-isobutylene, eicosane, mixtures of C<sub>2</sub> and C<sub>3</sub>, C<sub>6</sub> and C<sub>7</sub> hydrocarbons, hydrocarbon derivatives, and other hydrocarbons.

TABLE 2. --PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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]

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
-----	
AROMATICS AND NAPHTHENES	
-----	
ALKYL AROMATICS:	
Cyclools - - - - -	SHC.
Alkyl aromatics: all other - - - - -	AMO, BFG.
*Benzene 10 (99-100 %)- - - - -	AMO, APR, ASH, ATR, CCP, CO, CPI, CRP, CSD, CSO, CSP, EKX, ENJ, GOC, GRS, HES, KHI, MOC, MON, PLC, PPR, QH, SHC, SKO, SM, SOC, SOG, SUN, SMR, TID, TOC, TX, UCC, UOC, X.
Benzene 20 (98-98.9%)- - - - -	DOW.
Benzene 90-97.9% (Non-fuel)- - - - -	KLM.
Cresylic acid (Less than 75 percent distilling over 2150 C)- - - - -	FER.
Cresylic acid, refined - - - - -	ENJ.
*NAPHTHALENE - - - - -	ASH, CO, MON, TID.
*NAPHTHENE ACID:	
Naphthenic acid, acid number 150-199 - - - - -	HEC, SOC, SUN.
Naphthenic acid, acid number 200-224 - - - - -	FER.
Naphthenic acid, acid number less than 150 - - - - -	ATR, FER, GOC, HEC, SUN.
*TOLUENE ALL GRADES, TOTAL:	
*Toluene, 10 (99.5-100%)- - - - -	ASH, ATR, CPI, ENJ, GOC, GRS, HES, HST, MOC, PLC, QH, SHC, SKO, SOG, SUN, SMR, TID, TOC, TX, UOC.
*Toluene, 20 (98.5-99.4%)- - - - -	ATR, CO, DOM, ELP, KHI, PPR, SOG, UCC.
*Toluene, 90-98.4% (Non-fuel) - - - - -	CCP, CSD, CSP, MON, PPR, PFX, SKO, SM.
*XYLENES, MIXED, TOTAL:	
*Xylene, 30 (99-100%)- - - - -	AMO, ATR, CPI, GOC, HES, SHC, SOG, SWR.
*Xylene, 50 (98-98.9 %)- - - - -	CCP, CSD, ENJ, GRS, HCF, MOC, PPR, QH, TOC, UOC.
*Xylene, 90-97.9% (Non-fuel)- - - - -	AMO, ASH, CO, CSP, MOX, SOC, SUN, UCC.
*ALL OTHER AROMATICS AND NAPHTHENES:	
Aromatics,C9 - - - - -	CO, QH.
Carbon black feedstock - - - - -	ENJ, GOC.
Polyethylbenzene - - - - -	HST.
All other products from petroleum and natural gas, cyclic - - - - -	CO, CRP, EKX, ENJ, KHI, NMP, QH, SHC, SOG, UCC.

TABLE 2.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

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	
*ALPHA OLEFINS:	
Alpha olefins, C6-C7	GOC, SHC, SOC.
Alpha olefins, C8-C10	GOC, SHC, SOC.
Alpha olefins, C11-C15	GOC, SHC, SOC.
Alpha olefins, C19-C20	SOC.
Alpha olefins: all other	FER, SHC, SOC, TNA.
C <sub>6</sub> HYDROCARBONS:	
*Hexane	APR, ASH, ENJ, HMY, PLC, SHO, SOG, TNA, UOC, X.
Methylcyclopentadiene	ENJ.
Hydrocarbons, C6, all other	CPI, ENJ, PLC, SMC.
C/7 HYDROCARBONS:	
n-Heptane	PLC.
*Heptenes, mixed	AIP, AMO, EKX, ENJ, SOG, IID.
Hydrocarbons, C7, all other	ENJ.
C/8 HYDROCARBONS:	
Di-isobutylene (Di-isobutene)	EKT, FRS, PTT.
n-Octane	SOG, TNA.
Hydrocarbons, C8, all other	AIP, ENJ, FRS, SHC, IID.
C/9 AND ABOVE HYDROCARBONS (EXCEPT ALPHA OLEFINS):	
*Dodecene	ATR, ENJ, GP, SOC, SUN, UOC.
Eicosane	N HNY.
*Nonene (Tripropylene)	AIP, ATR, CSP, ENJ, FKE, IID, UOC.
*N-PARAFFINS - CARBON CHAIN LENGTH:	
n-Paraffins, C6-C9	CXY, SOG, UCC.
n-Paraffins, C6-C16	OH.
n-Paraffins, C9-C15	SHO, SOG.
n-Paraffins, C10-C14	ENJ, SHO, SOG.
n-Paraffins, C10-C16	CO.
n-Paraffins	CSP, ENJ, SHC, SOC, TNA.
Hydrocarbons, C8-C9, mixtures	CRP, PFR.
*Polybutene	AMO, CSD, SOC.
HYDROCARBON DERIVATIVES:	
n-Butyl mercaptan (1-Butanethiol)	PAS, PLC.
*tert-Butyl mercaptan (2-Methyl-2-propanethiol)	HAP, PAS, PLC.
Decyl mercaptans	PAS.
Di-tert-butyl disulfide	PLC.
Ethyl mercaptan (Ethanethiol)	HAP, PAS.
Hexadecyl mercaptans	PAS.
Isopropyl mercaptan (2-Propanethiol)	PAS.

TABLE 2. -- PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ALIPHATIC HYDROCARBONS	
C/1 HYDROCARBONS:	
Methane	MON, SHO, TX.
C/2 HYDROCARBONS:	
*Acetylene (for chemical use only)	DOM, MHO, RH, UCC.
*Ethane	ACU, AHO, CO, ENJ, IRC, MON, OMC, PLC, SHO, SM, USI.
*Ethylene	ACU, AHO, ATR, BAS, BFG, CBN, CO, CPX, CRP, DOM, DUP, EXX, ELP, ENJ, GOC, MCB, MON, NMP, OMC, PLC, SHC, SM, SNO, TX, UCC, USI, USS.
C/3 HYDROCARBONS:	
Hydrocarbons, C2-C3, mixtures-	CSO, KHI, MON.
Methyl acetylene propadiene-	CO, MON.
*Propane (Commercial and hd-5)	AHO, ASH, MCP, OMC, PLC, SHO, SM, SOG, SUN, TCR, GRS, IRC, KHI, MOC, OMC, PLC, SHO, SM, SOG, SUN, TCR, UCC, UOC, USI.
*Propylene	ACU, AHO, ASH, ATR, BFG, CCP, CLK, CO, CPX, CRP, CSD, CSO, DOM, DUP, EXX, ELP, ENJ, EPC, GOC, MCB, MOC, MON, NMP, PLC, SHC, SIO, SKO, SH, SOC, SOG, SUN, TCR, TX, UCC, USS, X.
C/4 HYDROCARBONS:	
*Butadiene and butylene fractions	ACU, CO, CPX, CRP, DOM, EXX, GOC, MNP, TUS, UCC.
*1,3-Butadiene, grade for rubber (Elastomers)	AHO, ATR, CO, CFI, DOM, ELP, ENJ, FRB, MON, PTT, SHC, SH, TUS, UCC.
*n-Butane	AHO, APR, ASH, COR, CSD, CSO, CFP, EFC, IRC, OMC, PLC, SHO, SM, SUN, TUS, USI.
*1-Butene	GOC, PTT, SHC, TNA.
2-Butene	CO, MON, PLC, SHC.
*1-Butene and 2-butene, mixed	ATR, CSO, DUP, ENJ, SHC, SOG.
Butylenes, mixed	MON, SM.
*Isobutane (2-Methylpropane)-	AHO, CSO, CFP, ELP, ENJ, IRC, KHI, OMC, PLC, SHO, SM, SUN, TUS, USI.
*Isobutylene (2-Methylpropene)-	AHO, ATR, ENJ, SHC, TUS, UCC.
*Hydrocarbons, C4, all other-	BFG, CBN, CO, CRP, ELP, ENJ, KHI, MCB, QH, SHC, SM, TNA.
C/5 HYDROCARBONS:	
Amylenes	SHO.
Dibutanized aromatic concentrate	DUP, ELP.
Isopentane (2-Methylbutane)-	PLC, SHO.
*Isoprene (2-Methyl-1,3-butadiene)-	ATR, CO, CRB, DOM, ENJ, MON, SHC, UCC.
*n-Pentane	APR, ASH, PLC, SHO.
*Pentenes, mixed	CRP, DOM, ENJ, QH, SHO, TUS, USS.
*Piperylene (1,3-Pentadiene)-	CRB, DOM, MON.
*Hydrocarbons, C5, all other-	ATR, CO, CSO, CXI, GOC, PLC, TUS, TX.

TABLE 2.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ALIPHATIC HYDROCARBONS--CONTINUED	
HYDROCARBON DERIVATIVES--CONTINUED	
Methyl mercaptan (Methanethiol)-----	PAS.
tert-Octyl mercaptan (2,4,4-Trimethyl-2-pentanethiol)-----	PAS.
Octyl mercaptans-----	PAS.
n-Propyl mercaptan (1-Propanethiol)-----	PAS, PLC.
Hydrocarbon derivatives: all other hydrocarbon derivatives-----	HAP, PAS, PLC, TX.
*Hydrocarbons, C9 and above, all other, including mixtures-----	CO, CPI, ENJ, GOC, MOC, SOG.



TABLE 3.--PRIMARY PRODUCTS FROM PETROLEUM AND NATURAL GAS FOR CHEMICAL CONVERSION: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of crude products from petroleum and natural gas for chemical conversion to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ACU	Allied Chemical Corp., Union Texas Petroleum Corp.	KHI	Koch Industries, Inc., Koch Refining Co.
ALP	Air Products & Chemicals, Inc.	KLM	Kalama Chemical, Inc.
AMO	Standard Oil Co. (Indiana)	MCB	Borg-Warner Corp., Borg-Warner Chemicals
APR	Atlas Processing Co.	MNO	Monochem, Inc.
ASH	Ashland Oil, Inc.	MOC	Marathon Oil Co., Texas Refining Div.
ATR	Atlantic Richfield Co., Arco Chemical Co.	MON	Monsanto Co.
BAS	BASF Wyandotte Corp.	NWP	Northern Petrochemical Co.
BFC	B. F. Goodrich Co., B. F. Goodrich Chemical Group	OMC	Olin Corp.
CBN	Cities Service Co., Petrochemicals Div.	PAS	Penwalt Corp.
CCP	Crown Central Petroleum Corp.	PLC	Phillips Petroleum Co.
CLK	Clark Oil & Refining Corp.	PPR	Phillips Puerto Rico Core, Inc.
CO	Conoco, Inc.	PPX	Phillips Paraxylene, Inc.
COR	Commonwealth Oil & Refining Co., Inc.	PTT	Petro-Tex Chemical Corp.
CPI	Commonwealth Petrochemicals, Inc.	QH	Quintana Petrochemical Co.
CPX	Chemplex Co.	RH	Rohm & Haas Co.
CPY	Copolymer Rubber & Chemical Corp.	SHC	Shell Oil Co., Shell Chemical Co. Div.
CRB	Caribe Isoprene Corp.	SHO	Shell Oil Co.
CRP	Corpus Christi Petrochemical Co.	SIO	Standard Oil of Ohio
CSD	Cosden Oil & Chemical Corp.	SKO	Getty Refining & Marketing Co.
CSS	Cities Service Co., Petroleum Products Group	SM	Mobil Oil Corp.:
CSP	Coastal Corp., Coastal States Petroleum Co.		Gas Liquids Dept.
CXI	Chemical Exchange Industries, Inc.		Mobil Chemical Co., Petrochemicals Div.
DOW	Dow Chemical Co.	SNO	Sunolin Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc.	SOC	Standard Oil Co. of California, Chevron Chemical Co.
EKX	Eastman Kodak Co., Texas Eastman Co. Div.	SOG	Charter International Oil Co.
ELP	El Paso Products Co.	SUN	Sun Company, Inc.
ENJ	Exxon Chemical Americas	SWC	Corco Cyclohexane, Inc.
EPC	Enterprise Products Co., Enterprise Petrochemicals Co. Sub.	SWR	Southwestern Refining Co.
FER	Ferro Corp., Productol Chemical Div.	TGR	Texas City Refining, Inc.
FKE	Frank Enterprises, Inc.	TID	Getty Refining & Marketing Co., Delaware Refinery
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.	TNA	Ethyl Corp.
GOC	Gulf Oil Corp., Gulf Oil Chemicals Co.-U.S.	TOC	Tenneco Oil Co., P & M
GP	Georgia-Pacific Corp., Houston Div.	TUS	Texas Butadiene Co.
GRS	Champlin Petroleum Co.	TX	Texaco, Inc.
HAP	Helmerich & Payne, Inc., National Gas Odorizing Div.	UCC	Union Carbide Corp.
HCP	Hercoffina	UOC	Union Oil Co. of California
HCC	Hewchem	USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co.
HES	Amerada Hess Corp. (Hess Oil Virgin Islands Corp.)	USS	USS Chemicals Div. of U.S. Steel Corp.
HMY	Humphrey Chemical Co.		
HST	American Hoechst Corp., Petrochemical Div.		
IRC	Independent Refinery Corp.		

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





## STATISTICAL HIGHLIGHTS

Edmund Cappuccilli

Cyclic intermediates are synthetic organic chemicals derived principally from petroleum and natural gas and from coal-tar crudes produced by destructive distillation (pyrolysis) of coal. Most cyclic intermediates are used in the manufacture of more advanced synthetic organic chemicals and finished products, such as dyes, medicinal chemicals, elastomers (synthetic rubber), pesticides, and plastics and resin materials. Some intermediates, however, are sold as end products without further processing. For example, refined naphthalene may be used as a raw material in the manufacture of 2-naphthol or of other more advanced intermediates, or may be packaged and sold as a moth repellent or as a deodorant. In 1981, about 42 percent of the total output of cyclic intermediates was sold; the rest was consumed chiefly in the producing plants in the manufacture of more advanced intermediates and finished products.

Total production of cyclic intermediates in 1981 amounted to 45,323 million pounds, an increase of less than one percent from the 45,070 million pounds produced in 1980. Sales of cyclic intermediates in 1981 were 19,202 million pounds, valued at \$7,437 million, compared with 20,060 million pounds, valued at \$7,248 million in 1980.

Intermediates which were produced in excess of 2 billion pounds in 1981 were ethylbenzene (7,813 million pounds), styrene (6,679 million pounds), dimethyl terephthalate (6,235 million pounds), p-xylene (4,532 million pounds), cumene (3,309 million pounds), and phenol (2,578 million pounds). Other large-volume intermediates produced in 1981 were cyclohexane (1,820 million pounds), isocyanates (1,203 million pounds), o-xylene (918 million pounds), nitrobenzene (902 million pounds), phthalic anhydride (870 million pounds), cyclohexanone (766 million pounds), aniline (634 million pounds), bisphenol A (555 million pounds), alkylbenzenes (535 million pounds), monochlorobenzene (285 million pounds), and toluene-2,4-diamine (205 million pounds). The chemicals noted above accounted for 88 percent of the total output of intermediates in 1981.



TABLE 1.--CYCLIC INTERMEDIATES: U.S. PRODUCTION AND SALES, 1981

[Listed below are all cyclic intermediates for which any reported data on production and 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 cyclic intermediates for which data on production and/or sales were reported and identifies the manufacturer of each]

CYCLIC INTERMEDIATES	SALES			
	PRODUCTION	QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
Grand total-----	45,323,048	19,201,715	7,436,562	\$0.39
Acetoacetanilide-----	10,285	9,340	10,012	1.07
o-Acetoacetanisidide-----	792	970	2,438	2.51
o-Acetoacetotoluidide-----	1,623	1,818	2,605	1.43
Acetophenone, tech-----	4,439	...	...	...
Alkylbenzenes <sup>2</sup> -----	535,271	426,154	203,631	.48
4-Amino-5-methoxy-2-methylbenzenesulfonic acid-----	1,279	...	...	...
6-Aminopenicillanic acid-----	1,679	...	...	...
p-(p-Aminophenyl)azobenzenesulfonic acid-----	174	...	...	...
Aniline (Aniline oil)-----	634,293	191,486	69,359	.36
Anilinetriethanesulfonic acid and salt-----	183	...	...	...
Benzoic acid, tech-----	78,547	29,863	13,429	.45
Biphenyl-----	47,116	21,674	7,742	.36
Butylphenols, mixed-----	2,750	2,393	1,952	.82
p-tert-Butyltoluene-----	3,284	...	...	...
Chlorobenzene, mono-----	285,480	85,822	29,643	.35
Cresols and cresylic acid, total <sup>3</sup> -----	137,250	124,080	80,439	.65
(m, p)-Cresol-----	31,672	28,675	17,594	.61
o-Cresol-----	32,239	28,146	18,950	.67
All other <sup>4</sup> -----	73,339	67,259	43,895	.65
Cumene-----	3,309,256	1,746,393	453,206	.26
Cyclohexane-----	1,819,530	1,542,559	411,890	.27
Cyclohexanone-----	765,542	35,667	19,133	.54
o-Dichlorobenzene-----	51,581	52,347	20,575	.39
p-Dichlorobenzene-----	73,533	68,829	26,279	.38
Dicyclopentadiene (including cyclopentadiene)-----	88,570	69,297	15,558	.22
1,4-Dihydroxyanthraquinone (Quinizarin)-----	618	...	...	...
N,N-Dimethylbenzylamine-----	229	...	...	...
2,4-Dinitrotoluene-----	504,292	...	...	...
Ethylbenzene-----	7,812,959	344,494	64,790	.19
Isocyanic acid derivatives, total-----	1,202,782	965,579	732,421	.76
Polymethylene polyphenylisocyanate-----	517,923	360,645	271,643	.75
Toluene-2,4- and 2,6-diisocyanate (80/20 mixture)-----	591,325	533,226	384,137	.72
Other isocyanic acid derivatives-----	93,534	71,708	76,641	1.07
4,4'-Isopropylidenediphenol (Bisphenol A)-----	554,565	197,562	98,703	.50
α-Methylstyrene-----	35,548	31,732	12,148	.38
o-Nitroaniline-----	6,777	...	...	...
p-Nitroaniline-----	13,661	...	...	...
Nitrobenzene <sup>5</sup> -----	901,631	19,574	5,517	.28
Nonylphenol-----	151,724	59,771	26,629	.43
Phenol, total <sup>3</sup> -----	2,577,631	1,061,978	318,580	.30
From cumene-----	2,485,974	990,422	295,350	.30
All other-----	91,657	71,556	23,230	.33
2,2'-[(Phenyl)imino]diethanol (N-Phenyldiethanol-amine)-----	433	220	180	.82
Phthalic anhydride-----	869,520	446,945	153,368	.34
Propiophenone-----	...	543	974	1.79
Salicylic acid, tech-----	37,768	...	...	...

See footnotes at end of table.

TABLE 1.--CYCLIC INTERMEDIATES: U.S. PRODUCTION AND SALES, 1981--CONTINUED

CYCLIC INTERMEDIATES	PRODUCTION		SALES	
	QUANTITY	VALUE	QUANTITY	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Styrene-----	6,679,453	2,993,179	998,174	\$0.33
Terephthalic acid, dimethyl ester <sup>6</sup> -----	6,234,986	...	...	...
Toluene-2,4-diamine (4-m-Tolylenediamine)-----	205,042	...	...	...
o-Xylene-----	917,601	812,211	201,264	.25
p-Xylene-----	4,532,421	2,974,234	900,097	.30
All other cyclic intermediates-----	4,231,950	4,885,001	2,555,826	.52

<sup>1</sup>Calculated from unrounded figures.

<sup>2</sup>Includes straight-chain dodecylbenzene, tridecylbenzene, and other straight-chain alkylbenzenes. Branched-chain alkylbenzenes are included in "All other cyclic intermediates." Data for 1980, included branch-chained alkylbenzenes.

<sup>3</sup>Does not include data for coke oven and gas-retort ovens, reported to the Office of Energy Data and Interpretation, Energy Information Administration, Department of Energy.

<sup>4</sup>Figures include (o,m,p)-cresol from coal tar, m-cresol, p-cresol, and cresylic acid refined from petroleum and coal tar.

<sup>5</sup>Data for 1981 are correct. Data for several previous years did not include all plants.

<sup>6</sup>The figures for terephthalic acid, dimethyl ester (DMT) include both the acid itself and the dimethyl ester without double counting. The acid production figure was multiplied by the factor 1.16 to convert it to equivalent DMT.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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 "N" SIGNIFIES THAT THE MANUFACTURER DID NOT CONSENT TO HIS IDENTIFICATION WITH THE DESIGNATED PRODUCT]

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
3-Acetamido-N-(2-succinimidoeethyl)-N-ethylaniline	: EKT.
Acetanilide, tech.	: SAL.
p-Acetanilide	: SDC.
*Acetic acid, phenyl ester	: BKN.
*Acetocetanilide	: BRD, EKT, HST.
*o-Acetoacetanilide	: BRD, EKT, HST.
*o-Acetoacetotoluidide	: BRD, EKT, HST.
p-Acetoacetotoluidide	: HST.
2',4'-Acetoacetoxylidide	: EKT, HST.
Acetoacet-n-xylylidide	: BRD.
1'-Acetonaphthone	: GIV.
*Acetophenone, tech.	: CLK, SKO, UCC.
p-Acetotoluidide	: EKT.
o-Acetylamino-p-toluenesulfonamide	: SDM.
p-Acetylbenzenesulfonamide	: LIL.
p-Acetylbenzenesulfonic acid, sodium salt	: LIL.
2-Acetylpyridine	: RIL.
*ALKYLBENZENES	
Alkylbenzene straight-chain (Except dodecyl and tridecyl)	: MON, WTC.
DODECYLBENZENE (INCLUDING TRIDECYLBENZENE):	
Dodecylbenzene, straight-chain	: CO, MON, UCC, WTC.
Dodecylbenzene, other	: CO, FER, SOC, WTC.
Alkylbenzene all other (Except dodecyl, tridecyl and straight-chain)	: CPS, PLC, WTC.
Alkylphenols, mixed	: FER.
Alkylpyridines, mixed	: RIL.
alpha-Phenethylamine	: HXL.
1-Amino-4-(4-acetaminoanilino)-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid	: VPC.
3'-Aminocetanilide	: TRC.
4'-Aminocetanilide (Acetyl-p-phenylenediamine)	: HST, TRC.
3'-Amino-p-acetanilide	: HST, SDC.
5-Amino-2-(p-aminoanilino)benzenesulfonic acid	: TRC.
2-(p-Aminoanilino)-5-nitrobenzenesulfonic acid	: TRC.
3-Amino-p-anisanilide	: PCM.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
1-Aminoanthraquinone and salt	TRC.
6-Amino-3,4'-azobiphenesulfonic acid (C.I. Acid Yellow 9)	TRC.
p-Aminobenzamide	LEL, SDH.
1-Amino-5-benzamidoanthraquinone	TRC.
o-Aminobenzethiol	FMI.
2-Amino-6-benzothiazolecarboxylic acid	LEL.
1-Amino-6-benzothiazolecarboxylic acid, monosodium salt	X.
1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	TRC, VFC.
1-Amino-2-bromo-4-hydroxyanthraquinone	AC, VPC.
2-Amino-1-chloroanthraquinone	VFC.
1-Amino-5-chlorobenzophenone	GNW.
1-Amino-2-chloro-4-hydroxyanthraquinone	TRC.
3-Amino-6-chloropyridazine	ACY.
2-Amino-5-chloro-p-toluenesulfonic acid [SO <sub>3</sub> H=1]	ACY, BAS.
6-Amino-5-chloro-m-toluenesulfonic acid [SO <sub>3</sub> H=1] (2B Acid)	DUP.
2-Amino-p-cresol	SOL.
1-Amino-2,4-dibromoanthraquinone	VPC.
1-Amino-2,4-dichloroanthraquinone	TRC.
4-Amino-N,N-di(6-hydroxyethyl)aniline sulfate	MAY.
5-Amino-2,4-dimethylacetanilide	X.
5-Amino-2,3-dimethylbenzenesulfethanamide	TRC.
3-Amino-6-ethylcyclohexanol	SDC.
4-Amino-N-ethyl-N-(6-methylsulfonamidoethyl)-m-toluidinephosphate	MAY.
4-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid, benzenesulfonate	TRC.
4-Amino-3-hydroxy-1-naphthalenesulfonic acid	TRC.
6-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt	TRC.
2-(2-Amino-5-hydroxy-7-sulfo-1-naphthylazo)-5-nitrobenzoic acid	TRC.
3-Amino-2-mercaptobenzoic acid	SDW.
2-Amino-5-methoxybenzene-1-sulfonic acid	TRC.
4-Amino-5-methoxy-2-methylbenzenesulfonic acid	ATL, VPC, X.
m-[(4-Amino-3-methoxyphenyl)azo]benzenesulfonic acid	AC, TRC.
n-[(4-Amino-3-methoxyphenyl)azo]benzenesulfonic acid, sodium salt	DUP.
3-[(4-Amino-3-methoxyphenyl)azo]1,5-naphthalene disulfonic acid	TRC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
3-[4-(4-amino-5-methoxy-o-tolyl)azo]-1,5-naphthalenedisulfonic acid		TRC.
3-amino-4-methylbenzamide		ARS.
3-amino-4-methylbenzamide		HST.
2-amino-4-methylbenzothiazole		MRT.
4-amino-4-(3-methyl-5-oxo-2-pyrazolin-1-yl)-2,1-stilbenedisulfonic acid		RIL, TRC.
2-amino-3-methylpyridine		TRC.
2-amino-4-(methylsulfonyl)phenol		TRC.
2-amino-1,5-naphthalenedisulfonic acid		ACY.
3-amino-1,5-naphthalenedisulfonic acid (C Acid)		TRC.
6-amino-1,3-naphthalenedisulfonic acid (Amino I acid)		AC, TRC.
7-amino-1,3-naphthalenedisulfonic acid		TRC.
2-amino-1,5-naphthalenedisulfonic acid, sodium salt		X.
2-amino-1-naphthalenedisulfonic acid (Tobias acid)		ACY, SW.
6-amino-2-naphthalenedisulfonic acid (Broenner's acid)		AC, TRC.
1-amino-5-naphthol		BUC.
5-(and 8)-amino-2-naphthol		BUC.
8-amino-2-naphthol		TRC.
6-amino-1-naphthol-3-sulfonic acid, sodium salt (7-amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt)		AC, TRC.
2-amino-6-nitrobenzothiazole		SAL.
2-amino-4-nitrophenol		SOL, VFC.
4-amino-4-nitro-2'-stalbenedisulfonic acid		AC, ATL, TRC.
2-amino-5-nitrothiazole		FCM.
3-aminooxalic acid		ATL.
4-aminooxalic acid		ATL.
3-amino-2-oxazolidinone		NOR.
* 6-aminoepiillanic acid		PFZ, TRD, MYT.
p-Aminophenol		HAL.
m-[(p-Aminophenyl)azo]benzenesulfonic acid		SCM.
* p-[(p-Aminophenyl)azo]benzenesulfonic acid		ACY, TRC, VFC.
7-[(4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid		TRC.
2,2'-(m-Aminophenyl)imino]diethanol, diacetate ester		TRC.
2-(p-Aminophenyl)-6-methyl-7-benzothiazolesulfonic acid and salt		ATL, TRC.
1-(m-Aminophenyl)-5-oxo-2-pyrazoline-3-carboxylic acid		TRC.
m-Aminophenylphosphonic acid		ICI.
2-Aminopyridine		NEP, RIL.



TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
3-Aminopyridine		RIL.
4-Aminopyridine		RIL.
3-Amino-p-toluamide		SDH.
4-Amino-m-toluenesulfonic acid [SO <sub>2</sub> H=1]		DUP.
6-Amino-m-toluenesulfonic acid [SO <sub>2</sub> H=1]		DUP.
m-[4-Amino-3-tolyl]azo]benzenesulfonic acid		TRC.
7-[4-Amino-o-tolyl]azo]-1,3-naphthalenedisulfonic acid		TRC.
*Aniline (Aniline oil)		ACY, DUP, FST, ICI, MAL, MOB, RUC, USR.
2-Anilinoethanol		EK, MIL, TCH.
7-Anilino-4-hydroxy-2-naphthalenesulfonic acid		ALD, TRC.
*Anilinoethanesulfonic acid and salt		ACY, TRC, VPC
8-Anilino-1-naphthalenesulfonic acid (Phenyl peri acid)		EK.
p-Anilinophenol		SDC.
o-Anisidinomethanesulfonic acid		ATL, TRC, VPC.
Anthra[1,9]pyrazol-6(2H)-one (Pyrazoleanthrone)		SM, TRC.
Anthraquinone, 100%		TRC.
N,N'-(1,5-Anthraquinonylene)dianthranilic acid		TRC.
4',4''-Azobis[4-biphenylcarboxylic acid]		VPC.
Benzaldehyde tech.		HM, KLM.
7-Benzamido-4-hydroxy-2-naphthalenesulfonic acid		TRC.
7H-Benz[e]anthracen-7-one (Benzanthrone)		TRC.
Benzenesulfonic acid		UPF.
Benzenesulfonyl chloride		UPF, USR.
1,2,4-benzenetricarboxylic acid 1,2-anhydride (Trimellitic anhydride)		AMO.
Benzhydrol (diphenylmethanol)		PD.
Benzil		GMM, IEM.
Benzimidazole		EK.
*Benzoic acid, tech.		HN, KLM, PFZ, VEL.
Benzoin		SFS.
Benzonitrile		SW.
Benzophenone		UPJ.
2-Benzothiazolethiol, sodium salt		BKM, GYR, USR.
1H-Benzotriazole		EK.
2-Benzoxazolethiol		EK.
Benzoyl chloride		HM, VEL.
2-Benzoyl pyridine		GMM.
N-Benzylacetamide		SDM.
Benzylamine		HXL.
2-(Benzylamino)ethanol		HXL.



TABLE 2. -- CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981 -- CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-Benzyl-6-chloro-3-keto-2-methyl-7-sulfamyl-1,2,4-benzylthiadiazine-1,1-dioxide	ABB.
Benzyl ether (Dibenzyl ether)	OPC.
3-(Benzylethylamino)acetanilide	EKT.
p-(Benzyl)phenol	FKE.
1-Benzyl-4-phenylisonipicotic acid, ethyl ester	SDW.
1-Benzyl-4-phenylisonipicotonitrile	SDM.
Benzyltrimethylammonium hydroxide	HXL.
[3,5-Bianthr[1,9-cd]pyrazole]-6,6'(2H,2'H)-dione (pyrazoanthrone Yellow)	TRC.
[4,4'-Bi-7H-benz[e]lanthracene]-7,7'-dione	TRC.
* Biphenyl	CHL.
N,N-Bis-(2-acetoxyethyl)-aniline	DOM, GOC, KHI, MON, SUN, TCC.
Bis(p-aminocyclohexyl)methane	VPC.
1,4-Bis[1-anthraquinonylamino]anthraquinone and 1,4-bis[5-Chloro-1-anthraquinonylamino]anthraquinone (Mixed)	DUP, TRC.
2,6-Bis(p-azidobenzylidene)-4-methylcyclohexanone	TRC.
4,5'-Bis-benzoylamino-1,1'-anthramid-2,2'-carbazole	X.
5,5'-Bis-benzoylamino-1,1'-anthramid-2,2'-carbazole	VPC.
4,4'-Bis-benzoylamino-1,1'-anthramid-2,2'-carbazole	VPC.
Bis(chlorosulfonyl)phthalocyaninedisulfonic acid, copper derivative	TRC.
4,4'-Bis(diethylamino)benzophenone (Ethyl ketone base)	X.
4,4'-Bis(dimethylamino)benzhydrol (Michler's hydrol)	X.
Bis(β-dimethylaminoethyl)phenylacetone trile	WYT.
1,5-Bis[2,4-dinitrophenoxy]-4,8-dinitroanthraquinone	VPC.
3'-[Bis(2-hydroxyethyl)amino]benzanilide, diacetate ester	TCH.
4,4'-Bis[(p-hydroxyphenyl)azo]-2,2'-stilbenedisulfonic acid (C.I. Direct Yellow 4)	VPC.
1,2-Bis(tribromophenoxy)ethane	GTL, VEL.
p-Bromoaniline	EK.
Bromobenzene, mono-	X.
o-Bromobenzic acid	X.
4-Bromo-3,5-dihydroxybenzamide	PCM.
2-(2-Bromo-4,6-dinitroaniline	HST, SDC.
diethylamino)acetamide	TRC.
Bromoethylbenzene	RSB.
α-Bromo-p-nitrotoluene (p-Nitrobenzyl bromide)	SDM.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
(p-Bromophenyl)acetoneitrile	
2-Bromopyridine	SFS.
p-Bromotoluene	OMC.
o-Bromotoluene	SFS.
m-Bromotoluene	WGC.
p-Butylaniline	TNA.
n-Butylaniline	TNA.
3-(N-Butylamino)propionitrile	ICH.
2-tert-Butylanthraquinone	DUP.
p-tert-Butylbenzaldehyde	GIV.
sec-Butylbenzene	PLC.
tert-Butylbenzene	PLC.
p-tert-Butylbenzoic acid	SHC.
o-(p-tert-Butylbenzoyl)benzoic acid	DUP.
2-tert-Butyl-p-cresol	FER.
6-tert-Butyl-p-cresol	ACY.
2-tert-Butyl-m-cresol	KFT.
2'-tert-Butyl-4',6'-dimethylacetophenone	GIV.
2-tert-Butyl-4-ethylphenol	ACY.
tert-Butylhydroquinone	UPJ.
2-tert-Butyl-5-methylanisole	GIV.
o-sec-Butylphenol	SCN, TNA.
o-tert-Butylphenol	TNA.
p-sec-Butylphenol	SCN.
p-tert-Butylphenol	FER, SCN, TNA.
*Butylphenols, mixed	FER, SCN, TNA.
#p-tert-Butyltoluene	GIV, SHC, SUN.
5-tert-Butyl-1,2,3-trimethylbenzene	GIV.
5-tert-Butyl-m-xylene	GIV, KHI, SUN.
6-tert-Butyl-2,4-xylene	FER, FIT.
d-10-Camphorsulfonic acid	KF.
3-Carboxy-1,4-dimethylpyrrole-2-acetic acid	SDM.
2-Chloroacetamido-5-chlorobenzophenone	MIT.
2'-Chloroacetacetanilide	EXT, HST.
4'-Chloroacetophenone	LIL.
4-(Chloroacetyl)acetanilide	DUP.
o-Chloroaniline	CHN, DUP.
m-Chloroaniline	DUP.
p-Chloroaniline	DUP, MON.
3-(o-Chloroamino)propionitrile	DUP, TCH.
1-Chloroanthraquinone	TRC.
2-Chloroanthraquinone	ACY.
o-Chlorobenzaldehyde	SDH.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
o-Chlorobenzamide	X.
Chloro-7H-benz[de]lanthracen-7-one (Chlorobenzanthrone)	TRC.
*Chlorobenzene, mono-	DOM, MON, MTO, PPG, SCC.
p-Chlorobenzenesulfonic acid	TRC.
p-Chlorobenzenesulfonic acid	UPF.
p-Chlorobenzenechlorol	SFA.
p-Chlorobenzophenone	X.
o-Chlorobenzoyl chloride	X.
Chloro(p-chlorophenyl)phenylmethane	OPC.
2-Chloro-1,4-dibutoxybenzene	ALL.
1-Chloro-2,5-dibutoxy-4-nitrobenzene	ALL.
2-Chloro-1,4-dieethoxybenzene	ALL.
1-Chloro-2,5-dieethoxy-4-nitrobenzene	ALL.
7-Chloro-1,3-dihydro-3-hydroxy-5-phenyl-2H-1,4-benzodiazepin-2-one, acetate ester	MYT.
7-Chloro-1,3-dihydro-5-phenyl-2H-1,4-benzodiazepin-2-one-4-oxide	MYT.
4'-Chloro-2',5'-dimethoxyacetanilide	PCM.
4-Chloro-2,5-dimethoxyaniline	PCM.
5-Chloro-2,4-dimethoxyaniline	ALL.
2-Chloro-1,4-dimethoxybenzene	PCM.
4-Chloro-2,5-dimethoxynitrobenzene	PCM.
2-[p-Chloro-(2-dimethylaminoethyl)benzyl]pyridine	SK.
2-Chloro-10-[3-(dimethylamino)propyl]phenothiazine	SK.
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	TRC.
3-Chloro-4,6-dinitrobenzenesulfonic acid	SDC.
4-Chloro-3,5-dinitrobenzenesulfonic acid, potassium salt	SDC.
3-Chlorodiphenylamine	SK.
N-(2-Chloroethyl)-N-ethylamine	TCH.
4-Chloro-5'-ethyl-2'-hydroxybenzanilide	LIL.
p-[[2-Chloroethyl)methylamino]benzaldehyde	DUP.
2-Chloroethyl-p-toluenesulfonic acid	LIL.
2-Chloro-4'-fluorobenzophenone	LIL.
4-Chloro-N-isopropyl-3-nitrobenzenesulfonamide	TRC.
4-Chloro-N-methyl-3-nitrobenzenesulfonamide	TRC.
2-Chloro-10-[3(4-methyl-1-piperazinyl)propyl]phenothiazine	SK.
ar-Chloromethylstyrene	DOM.
5-Chloro-2-(N-methyl)sulfamyl-4-sulfamyl-N-benzylaniline	ABB.

TABLE 2. --CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
2-[(Chloromethyl)thio]benzothiazole	BKM.
2-Chloro-4-nitroaniline (o-Chloro-p-nitroaniline)	DUP.
4-Chloro-2-nitroaniline (p-Chloro-o-nitroaniline)	DUP.
1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	DUP. MON.
1-Chloro-3-nitrobenzene (Chloro-m-nitrobenzene)	SCC.
1-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	DUP. MON.
4-Chloro-3-nitrobenzenesulfonamide	TRC.
4-Chloro-3-nitrobenzenesulfonic acid	TRC.
2-Chloro-5-nitrobenzenesulfonamide	TRC.
2-Chloro-5-nitrobenzenesulfonic acid	SDC.
4-Chloro-3-nitrobenzenesulfonyl chloride	SAL.
2-Chloro-4-nitrobenzoic acid	TRC.
2-Chloro-5-nitrobenzoic acid	SAL.
4-Chloro-4-nitrobenzoic acid, potassium salt	TRC.
4-Chloro-3-nitrophenylmethyl sulfone	DUP.
2-Chloro-4-nitrotoluene	MON.
o-Chlorophenol	MON. RDA.
p-Chlorophenol	SK.
2-Chlorophenothiazine	SK.
4-Chloro-o-phenyl-o-cresol	MON.
o-Chlorophenylcyclopentyl ketone	X.
o-Chlorophenyl-1-hydroxycyclopentyl-N-methylketamine	X.
1-(m-Chlorophenyl)-3-methyl-2-pyrazolin-5-one	TRC.
p-Chlorophenyl methyl sulfone	TRC.
4-Chlorophthalic acid	SM.
(3-Chloropropyl)benzene	SDM.
2-Chloropyridine	MES. OMC.
2-[[4-(7-chloro-4-guino)yl]-amino]pentyl]ethylamino]ethanol	SDM.
4-Chlororesorcinol	PCM.
5-Chloro-4-sulfamyl]-2-(N-methylsulfamyl)aniline	ABB.
o-Chlorotoluene	HK.
o-Chlorotoluene (Benzyl chloride)	MON. SFS.
3-Chloro-p-toluene [NH <sub>2</sub> =1]	DUP.
3-[2-Chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoic acid	SDC.
p-Chloro-o,c-trifluorotoluene	HK.
4-Chloro-3,5-xylene	FER.
Cinnamoyl chloride	EK.
Copper, [2, 2', 2'', 2''', -[29H, 31H-Pphtalacyanine]pentakis(methylene)]pentakis [H-isoindole-1, 3(2H)-dionato]]	X.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
* CRESOLS:		
m-Cresol		KPT, MER.
* O-CRESOL:		
o-Cresol, from coal tar		FER.
o-Cresol, from petroleum		DA, FER, GE, MER, PIT, SW.
p-Cresol		MER, SM.
CRESOLS, MIXED:		
* (M,P)-CRESOL:		
(m,p)-Cresol, from coal tar		FER, KPT.
(m,p)-Cresol, from petroleum		DA, FER, MER, NFC.
(O,M,P)-CRESOL:		
(o,m,p)-Cresol, from coal tar		KPT.
Cresols, mixed		PIT.
* CRESYLIC ACID, REFINED:		
Cresylic acid, refined from coal tar		FER, KPT.
Cresylic acid, refined from petroleum		DA, FER, MER.
* Cumene (Isopropyl benzene)		ASH, CLK, GOC, GP, GRS, KHI, MON, SHC, SKO, SOC, SUN, TX, UCC.
p-Cumylphenol		MON.
2-[p-(Cyanacetamido)phenyl]-6-methyl-7-benzothiazolesulfonic acid		DUP.
4-(Cyanacetamido)morpholine		DUP, PCM.
N-[3-[(2-Cyanoethyl)ethylamino]phenyl]acetamide		SDC.
P-[2-(2-Cyanoethyl)methylamino]benzaldehyde		ATL.
N-Cyano-N-methyl-N-2(4-methyl-5-imidazolyl)methylthioethylisothiourea		SK.
4-Cyano-pyridine		RIL.
Cyclohexane		CSD, ENJ, GOC, GRS, PLC, PFR, SUN, SMC, SWR, TX, UOC.
Cyclohexanol		AFP, DBC, DUP, MON.
* Cyclohexanone		AFP, CEL, CNP, DEC, DUP, MON, UCC.
Cyclohexanone oxime		KNP.
Cyclohexene		PLC, USR.
3-Cyclohexene-1-carboxaldehyde		UCC.
4-Cyclohexene-1,2-dicarboximide		SFC.
4-Cyclohexene-1,2-dicarboxylic anhydride		DKA.
Cyclohexene oxide		USR.
β-(1-Cyclohexenyl)ethylamine		HXL.
Cyclohexylamine		ABB, RBC, VGC.
N-Cyclohexyltaurine, sodium salt		GAF.
cyclooctadiene		DUP.
Cyclopentene		AID.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
P-Cymene		
Dicymene		HPC
Diacetamid[1,2-j], 2', 2'-1-fluoranthene (Decacyclene)		SDC
3,5-Diacetamido-2,4,6-triiodobenzoic acid		SDM
1,5-(and 1,8)-diaminoanthraquinone		SDC
2,6-Diaminoanthraquinone		AC
2,4-Diaminobenzenesulfonic acid [SO <sub>3</sub> H=1]		TRC
1,3-Diaminocyclohexane		DUP, MIL
1,4-Diamino-2,3-dicyanoanthraquinone		DUP
1,4-Diamino-2,3-dihydroanthraquinone		DUP
4,8-(and 4,5)-diamino-9,10-dihydro-1,5-(and 1,8)-dihydroxy-9,10-dioxo-2,6-(and 2,7)-anthracenedisulfonic acid		TRC
1,4-Diamino-9,10-dihydro-9,10-dioxo-2,3-anthracenedicarbonyl		DUP
1,5-Diamino-4,8-dihydroxyanthraquinone		VPC
2,6-Diaminopyridine		RIL
4,4'-diamino-2,2'-stilbenedisulfonic acid		SDM
3,5-Diamino-2,4,6-triiodobenzoic acid		CGY, SDH, TRC
2,5-Diaminonoterephthalic acid		EKT
Diazo(1-naphthol-5-sulfonic acid, sodium salt)		HST
Dibenz(o,de)chrysene-7,14-dione		TRC
1,5-Dibenzoylnaphthalene		TRC, VPC
N, N'-dibenzylmethanediamine		WYT
N, N'-dibenzylethylenediamine diacetate		WYT
4,10-Dibromo-anthracene		VPC
3,9-Dibromo-7H-benz[e]anthracen-7-one		TRC
2,6-Dibromo-4-nitroaniline		HST, SDC
3,5-Dibromo-3'-trifluoromethylsallylanilide (Fluorophene)		FCM
P-Dibutylbenzene (DBB)		ALL
2,5-Dibutoxy-4-morpholinobenzenediazonium sulfate salt (DBB Sulfate)		ALL
2,6-Di-tert-butyl-0-dimethylamino-p-cresol		ALL
2,6-Di-tert-butyl-1,4-nonylphenol		TNA
2,4-Di-tert-butylphenol		GAF
2,6-Di-sec-butylphenol		FER, PII
3,4-Dichloroaniline		TNA, MON
1,5-Dichloroanthraquinone		DUP, MON
2,6-Dichlorobenzaldehyde		TRC
o-(and p)-Dichlorobenzene		DUP
*o-Dichlorobenzene		MTO
		DOM, MON, PFG, SCC

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
m-Dichlorobenzene	MON.
p-Dichlorobenzene	DOM, MON, PPG, SCC.
4,6-Dichloro-m-benzenedisulfonamide	ABB.
3,3'-Dichlorobenzidine base and salts	LAK.
2,2'-Dichlorobenzil	CNN.
4,4'-Dichlorobenzil	MTO.
Dichlorobenzyl chloride	SFS.
7,16-Dichloro-6,15-dihydro-5,9,14,18-anthrazine tetrone	IRC.
Dichlorodiphenylsilane	DDC.
2,5-Dichloro-4-(3-methyl-5-oxo-2-pyrazolin-1-yl)-benzenesulfonic acid	TRC.
Dichloromethylphenylsilane	DDC.
2,6-Dichloro-4-nitroaniline	CNN.
1,2-Dichloro-4-nitroaniline	DUP, MON.
1,4-Dichloro-2-nitrobenzene	DUP, PCW.
1,4-Dichloro-2-nitrobenzene (Nitro-p-dichlorobenzene)	DOM, MON, RDA.
2,4-Dichlorophenol	DOM.
2,6-Dichloropyrazine	ACY.
2,5-Dichlorosulfanilic acid (SO <sub>2</sub> H=1)	VPC.
2,5-Dichloro-4-sulfobenzenediazotium sulfate	TRC.
p-α-Dichlorotoluene	HK.
Dicyclohexylamine	ABB, VGC.
Dicyclopentadiene (includes cyclopentadiene)	CO, CRB, CXI, DOM, ENJ, GOC, MON, VEL.
Dicyclopentadiene dioxepide	VIK.
Dodecylbenzene	CO.
p-Diethoxybenzene	ALL.
p-(Diethylamino)benzaldehyde	VPC.
3'-[[2-(Diethylamino)ethyl]-4'-hydroxyacetanilide hydrochloride	X.
2[(4-diethylamino-2-hydroxybenzyl)benzoic acid]	ACY.
7-Diethylamino-4-methylcoumarin, crude	PCY.
m-(Diethylamino)phenol (N,N-Diethyl-3-aminophenol)	ACY, X.
N-[3(diethylamino)phenyl]acetamide	IRC.
4-(Diethylamino)-o-tolualdehyde	DUP.
N,N-Diethylaniline	ACY, BCC, DUP.
2,6-Diethylaniline	TNA.
Diethylbenzene	DOM.
N <sup>1</sup> ,N <sup>1</sup> -Diethyl-4-methoxymetanilamide	PCW.
N,N-Diethyl-m-toluidine	DUP.
2,4-Difluoroaniline	OMC.
6,11-Dihydrodibenz(b,e)oxepin-11-one	PFZ, SK.
9,10-Dihydro-9,10-dioxo-1,5-anthracenedisulfonic acid	TRC.



TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
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-1-anthracenesulfonic acid and salt		TRC.
Dihydrophenylglycine danc salt		SK.
1, 2-Dihydro-2, 2, 4, 7-tetramethylquinoline		EKT.
1, 4-Dihydroxyanthraquinone		EKT, HSH, TRC.
1, 8-Dihydroxyanthraquinone		TRC.
2, 5-Dihydroxy-p-benzenedisulfonic acid, dipotassium salt		EK.
2, 4-Dihydroxybenzophenone		ACY.
4, 4'-Dihydroxybiphenyl		BCC.
1, 5-Dihydroxy-4, 8-dinitroanthraquinone		TRC, VPC.
1, 8-Dihydroxy-4, 5-dinitroanthraquinone		EKT, VPC.
N,N-di(6-hydroxyethyl)-m-chloroaniline		MIL.
3, 5-Dihydroxy-N-(2-hydroxyethyl)benzamide		PCM.
4, 5-Dihydroxy-2, 7-naphthalenedisulfonic acid (Chromotropic acid)		TRC.
6, 7-Dihydroxy-2-naphthalenesulfonic acid		WAY.
16, 17-Dihydroxyvioranthone (Dihydroxydibenzanthrone)		TRC.
Diisopropylbenzene		GP.
N,N-diisopropyl-p-phenylenediamine		DUP.
2, 5-Dimethoxyaniline		EKT.
1, 5 and 1, 8-Dimethoxyanthraquinone		TRC.
m-Dimethoxybenzene		ACY.
2, 5-Dimethoxytetrahydrofuran		HEX.
p-(Dimethylamino)benzaldehyde		EK, TRC, X.
m-(Dimethylamino)benzoic acid		X.
m-Dimethylamino phenol		ACY.
11-[3-(Dimethylamino)propyl]-11-hydroxydibenz(b,e)-oxepin		PFZ, SK.
*N,N-Dimethylaniline		BCC, INA.
3, 3'-Dimethylbenzidine hydrochloride		EK.
N,N-Dimethylbenzylamine		ARS, HXL, RH, SM.
Dimethyl-1, 4-cyclohexanedicarboxylate		EKT.
5, 5-Dimethyl-1, 3-cyclohexanedione		EKT.
N,N-Dimethylcyclohexylamine		ABB.
5, 5-Dimethylhydantoin		GLY.
2, 5-Dimethyl-4(2)-morpholinylmethylphenol, hydrochloride		TRY, WAY.

TABLE 2. --CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
N,N-Dimethyl-p-nitrosoaniline	: EK.
3,5-Dimethylpyrazole	: UPJ.
N,N-Dimethyl-o-toluidine	: RSA.
N,N-Dimethyl-p-toluidine	: RSA.
2,4-Dinitroaniline	: HST, SDC.
1,5(and 1,8)-Dinitroanthraquinone	: SDC.
m-Dinitrobenzene	: DUP.
3,5-Dinitrobenzoic acid	: DUP.
10,10'-Dinitro[3,3'-bi-7h-benzidene]anthracene-7,7'-dione	: RH.
4,4'-Dinitrodiphenyl ether	: DUP.
3',5'-Dinitro-2'-hydroxyacetanilide	: TPC.
2,6-Dinitro-4-isopropylphenol	: SDC.
2,4-Dinitrophenol, tech.	: SDC, VPC.
3,5-Dinitrosalicylic acid	: SAL.
4,4'-Dinitrostilbene-2,2'-disulfonic acid	: CGY.
*2,4,4-Dinitrostilbene-2,2'-disulfonic acid, sodium salt	: X.
2,4,4-Dinitrotoluene	: ACS, DUP, RUC, X.
2,4(and 2,6)-Dinitrotoluene	: DUP, MOB, OMC.
3,5-Dinitro-o-toluic acid	: SAL.
Dinonylphenol	: GAF, MON, TX.
2,4-di-tert-pentylphenol	: FER, PAS.
2-(2,4-Di-tert-pentylphenoxy)butyric acid	: EK.
1,5-Diphenoxysanthraquinone	: VPC.
Diphenylacetoni-trile, tech.	: SOL.
Diphenylamine	: ACY, ORO, RUC, USR.
1,4-di-p-toluidinoanthraquinone	: TRC.
2,5-di-p-toluidinoterephthalic acid	: EKT.
Divinylbenzene	: DOM, HST.
Dodecahydro-1,4a-dimethyl-7-(1-methylethyl)-1-phenanthrene-methanol	: HPC.
Dodecylaniline	: MON.
Dodecylbenzyl chloride	: SFS.
Dodecylmethylbenzyl chloride	: RH.
P-Dodecylphenol	: GAF, MCB, MON.
Doxepin base	: SK.
4(5)-Ethoxycarbonyl-5(4)-methylimidazole	: SK.
6-(2-Ethoxy-1-naphthamido)penicillanic acid	: MYT.
2-Ethoxy-1-naphthoic acid	: MYT.
2-Ethoxy-1-naphthoic chloride	: MYT.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-Ethoxy-o-phenylenediamine		TRC.
N-(6-Ethoxy-3-pyridazinyl)sulfanilamide		ACY.
3-(Ethylamino)acetanilide		EKI.
N-Ethyl-N-( $\beta$ -aminoethyl)-m-toluidine		X.
o-Ethylaniline		TNA.
N-Ethylaniline, refined		ACY, BCC, DUP.
2-(N-Ethylanilino)ethanol		MIL, TCH.
3-(N-Ethylanilino)propionitrile		MIL, TCH.
$\alpha$ -(N-Ethylanilino)-m-toluenesulfonic acid		X.
*Ethylbenzene		AMO, ATR, CO, CSP, DOM, ELP, GOC, HST, KHI, KPT, MCB, MON, SOG, SUN, TOC.
Ethylbenzyl chloride		SFS.
d(-)Ethyl-3-( $\alpha$ -carboxybenzyl)amino crotonate, potassium salt		KF.
N-Ethyl-N-(2-chloroethyl)-3-toluidine		VPC.
2-(N-Ethyl-N, $\beta$ -cyanoethyl)-4-acetaminoisole		SDC, TCH.
N-Ethylcyclohexylamine (Herbicide intermediate)		ABB.
Ethylene-bis-tetrabromophthalimide		TNA.
3,3'-Ethyleneedioxydiphenol		WAY.
N-Ethylmalonamide		REG.
dl-12 $\beta$ -ethyl-3-methoxy-8,14-secoisogona-1,3,5(10),9(11)-tetraene-14,17-dione		WYT.
6-Ethyl-2-methylaniline		TNA.
N-Ethyl-N-(2-methylsulfonamidoethyl)-m-toluidine		X.
9-Ethyl-3-nitrocarbazole		SDC.
$\alpha$ -Ethyl-3-nitrocinnamic acid		SDM.
N-Ethyl-N-phenylbenzylamine		X.
N-Ethyl-N-(3'-sulfobenzyl)aniline		VPC.
Ethyl toluene		DOM.
N-Ethyl-m-toluidine		DUP.
3-(N-Ethyl-m-toluidino)propionitrile		MIL, TCH.
4-Fluoro-3-nitroaniline		OMC.
o-Fluoronitrobenzene		OMC.
o-Formylbenzenesulfonic acid, sodium salt		X.
1-Formylpiperidine		RIL.
Fuzan		QKO.
Fuzanyl alcohol		QKO.
Hexachlorocyclooctadiene		VEL.
1,4,5,6,7,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendic anhydride)		VEL.
Hexahydro-1-methyl-4-phenyl-1H-azepine-4-carbonitrile		WYT.

TABLE 2. -- CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Hexamethyleneimine	: CXL, DUP.
Hydroquinone, tech.	: EKT, GYR.
p-Hydroxybenzaldehyde	: DOM.
p-Hydroxybenzenesulfonic acid	: FER, UPF.
3-[N-(2-Hydroxyethyl)anilino]propionitrile	: MIL, TCH.
3-[N-(2-Hydroxyethyl)anilino]propionitrile acetate	: MIL, TCH.
N-(2-Hydroxyethyl)-o-chloroaniline	: EKT.
N-6-Hydroxyethyl-2,4-dihydroxybenzamide	: PCW.
N-Hydroxyethylpyrrolidone (stripped)	: GAF.
3-[N-(2-Hydroxyethyl)-m-toluidino]propionitrile	: DUP.
4-Hydroxy-4'-isopropylmethanilamide	: TRC.
4-Hydroxymethanilamide	: DUP, TRC.
4-Hydroxymethanilamide	: TRC.
3-Hydroxy-2-methylcinchoninic acid	: TRC.
4-Hydroxy-8'-methylmetanilamide	: TRC.
4(5)-Hydroxy-methyl-5(4)-methylimidazole hydrochloride	: SK.
4-Hydroxy-7-methyl-1,8-naphthyridine-3-carboxylic acid, ethyl ester	: X.
3-Hydroxy-N-(3-N-morpholino-7-propyl)-2-naphthamide	: WAY.
7-Hydroxy-1,3-naphthalenedisulfonic acid	: TRC.
3-Hydroxy-2,7-naphthalenedisulfonic acid, disodium salt	: TRC.
6-Hydroxy-2-naphthalenesulfonic acid, sodium salt	: ACY, TRC.
8-Hydroxy-1-naphthalenesulfonic acid, 7-sulfone	: TRC.
3-Hydroxy-2-naphthoic acid (B.O.N.)	: PCW.
3-Hydroxy-2-naphthoic acid, ethanalamide	: PCW.
3-Hydroxy-2-naphthoic acid, methyl ester	: PCW.
3-Hydroxy-2-naphthoic acid, sodium salt	: PCW.
2-Hydroxy-1,4-naphthoquinone	: TRC.
N-(7-Hydroxy-1-naphthyl)acetamide	: SAL.
1-(2-Hydroxy-1-naphthylazo)-6-nitro-2-hydroxynaphthalene-4-sulfonic acid	: TRC.
2-Hydroxy-5-nitrotanilic acid	: TRC.
1-Hydroxy-6-octadecyloxy-2-naphthoic acid	: ARA.
2-Hydroxy-4-n-octoxybenzophenone	: GCM.
3-[(4-(4-Hydroxyphenylazo)-2,5-dimethoxyphenyl)azo]benzenesulfamic acid	: TRC.
11 $\alpha$ -Hydroxyprogesterone	: UPJ.
1-Hydroxy-4-p-toluidinoanthraquinone	: HSH.
2-Indolecarboxylic acid	: ARA.
Indole-2,4-dione	: TRC.
2-Iodoacetamido-5-chlorobenzophenone	: WYT.

TABLE 2. --CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
p-Todotoluene	EK.
Isatoic anhydride	SM.
Isobutylbenzene	PLC, TNA.
*ISOCYANIC ACID DERIVATIVES:	
Bitolylene diisocyanate (TODI)-	CMN.
Diphenylmethane-4,4'-diisocyanate (MDI)-	MOB, RUC, UPJ.
Isocyanic acid, p-chlorophenyl ester-	MOB.
Isonicotinamide	RIL.
Phenylisocyanate	MOB.
*Polymethylene polyphenylisocyanate	MOB, RUC, UPJ.
Toluene 2,4-diisocyanate	DUP, MOB.
*Toluene 2,4- and 2,6-diisocyanate (80/20 Mixture)	ACS, MOB.
Toluene 2,4- and 2,6-diisocyanate (65/35 Mixture)	MOB, BAS, DOM, DUP, MOB, OMC, RUC.
p-Toluenesulfonyl isocyanate	CMN.
Isocyanic acid derivatives, all other-	MOB, UCC.
2-Isontrosoacetanilide	TRC.
Isophthalic acid (Benzene-1,3-dicarboxylic acid)	AMO.
Isophthalic acid, diphenyl ester	BjL.
Isophthaloyl chloride	DUP, SM, TLC, USR.
Isopropylbiphenyl-	TCC.
5,5'-Isopropylidenebis(2-hydroxy-m-xylene- $\alpha,\alpha'$ -diol)	ARK.
*4,4'-Isopropylidenediphenol (Bisphenol A)-	DOM, BE, SHC, UCC, USS.
4,4'-Isopropylidenediphenol, ethoxylated	ICI.
4,4'-Isopropylidenediphenol, propoxylated	ICI, YPC.
o-Isopropylphenol-	TNA.
p-Isopropylphenol-	FER.
Isopropylphenol, mixed	FER, FMP.
Isothiocyanic acid, phenyl ester	EK.
Leuco quinoxalin (1,4,9,10-Anthratrol)	HSB, TRC.
2,4-Lutidine	KPT.
2,6-Lutidine	RIL.
3,4-Lutidine	RIL.
Mandelonitrile	KF.
Metaxane	ACY, HLC.
p-Menta-1,4(0)-diene	GIV.
dl-P-Menta-1,6-diene (Limonene)	ARZ, NCI.
p-Mentane-3-carboxylic acid	SDM.
p-Menth-1-ene (Carvomenthene)-	GIV.
1-Menthylchloride	SDM.
Metanillic acid (m-Aminobenzenesulfonic acid)	DUP, TRC, USM.
4-Methoxyacetanilide	TRC.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER.  
1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
2-Methoxyethylpiperidine	RIL.
N-(4-Methoxy-3-nitrophenyl)acetamide	SDC.
(p-Methoxyphenyl)acetic acid	HEX.
N[4-[(1-(2-Methoxyphenylamino)carbonyl)-2-oxopropylsazophenyl]-4-[(1-(2-methoxyphenylamino)-carbonyl)-2-oxopropylsazobenzamide]]	X.
Methylacetatoic ester enamine of D-2-amino-2-(1,4-cyclohexadienyl)acetic acid sodium salt	TRD.
1-(Methylamino)-4-p-toluoldiorthoquinone	VPC.
2-(N-Methylaniilino)ethanol	TCH.
3-(N-Methylaniilino)propionitrile	MIL, TCH.
5-Methyl-o-anisidinesulfonic acid	SM.
m-Methylanisole	GIV.
2-Methylantraquinone	ACY.
3-Methylbenzof[quinoline]	ACY.
2-Methylbenzothiazole	FPI.
4-Methylbenzothiazolone, hydrazone	LIL.
N-Methylbenzylamine	HXL.
5-(1-Methylbutyl)barbituric acid	BCC.
N-Methyl-N-carboxyanthranilic anhydride	SM.
1-Methyl-4-(3-chloropropyl)piperazine hydrochloride	SK.
Methylcyclohexane	PLC.
N-Methylcyclohexylamine	ABB.
2-Methylcyclohexylamine	ABB.
N-Methylidicyclohexylamine	ABB.
4-Methyl-2,6-dinitrophenol	SM.
4,4'-Methylenebis[N,N'-diethylaniiline]	ACY, X.
4,4'-Methylenebis[N,N'-dimethylaniiline] (Methane base)	ACY, X.
4,4'-Methylenebis[3-hydroxy-2-naphthoic acid], disodium salt	EK.
4,4'-Methylenedianiline	ACS, DUP, OMC, RUC, USR.
1,2-Methylenedioxybenzene	CRZ.
1,2-Methylenedioxy-4-nitrobenzene	X.
5,5'-Methylenedisalicylic acid	HN.
Methylhydroquinone	EKT.
(2,4-Methyl-5-imidazolyl)methylthioethylamine dihydrochloride	SK.
N-Methyl-p-nitroaniiline	ACY.
4-Methyl-2-nitroanisole	SM.
4-Methyl-3-nitrobenzoic acid, methyl ester	X.
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	BCC.

TABLE 2. --CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
m-(3-Methyl-5-oxo-2-pyrazolin-1-yl)benzenesulfonamide	VFC.
p-(3-Methyl-5-oxo-2-pyrazolin-1-yl)benzenesulfonic acid	TRC.
2-Methyl-5-phenylbenzoxazole	EK.
1-Methyl-4-phenylisonicotinic acid	MYT.
4-Methylphthalic acid	EK.
4-Methylphthalic anhydride	EK.
[(6-Methyl-2-pyridinylamino)methylene]propanedioic acid, diethyl ester	X.
4'-[(4-Methyl-2-pyrimidinyl)sulfamoyl]acetanilide	DUP.
N-Methylpyrrole-2-acetonitrile	SDM.
*α-Methylstyrene	CIK.
2-(Methylsulfonyl)-4-nitroaniline	TRC.
N-Methyl-N-[4-(H-1,2,4-triazol-3-ylazo)phenyl]- benzenethanamine	TRC.
1-Morpholino-2,5-dibutoxy-4-nitrobenzene	ALL.
1-Morpholino-2,5-diethoxy-4-nitrobenzene	ALL.
1-Naphthaldehyde	GNM.
NAPHTHALENE, SOLIDIFYING AT 79 C. OR ABOVE	
FLAKE):	
Naphthalene, solidifying at 79° C. or above (Refined flake), from imported crude naphthalene	ASH.
2,7-Naphthalenedisulfonic acid	ACS, TRC.
1-Naphthalenesulfonic acid	TRC.
2-Naphthalenesulfonic acid	AC, ACY.
1-Naphthalenesulfonic acid, sodium salt	TRC.
1,4,5,8-Naphthalenetetracarboxylic acid	HST.
Naphthalimide	SDC, VFC.
1-Naphthol	GNM.
1-Naphthol (α-Naphthol)	UCG.
2-Naphthol, tech. (β-Naphthol)	ACY.
Naphth[1,2-d][1,2,3]oxadiazole-5-sulfonic acid	TRC.
1-Naphthylamine (α-Naphthylamine)	DUP.
p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2- naphthylamine)	SDC.
Nicotinitrile (3-Cyanopyridine)	NEP.
3-Nitroacetanilide	EK.
4-Nitroacetanilide	TRC, VFC.
2-Nitro-p-acetanilide	VFC.
4-Nitro-o-acetanilide	SDH.
4'-Nitro-4-amino-3-methoxyazobenzene	SDC.
*o-Nitroaniline	DUP, MON, X.



TABLE 2. -- CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
* p-Nitroaniline	: AC, DUP, MON.
2-Nitro-p-anisidine [MH <sub>2</sub> =1]	: DUP.
5-Nitro-o-anisidine [MH <sub>2</sub> =1]	: SDH.
5-Nitroanthranilic acid	: TRC.
1-Nitroanthraquinone	: TRC.
m-Nitrobenzaldehyde	: SDH.
* Nitrobenzamide	: X.
m-Nitrobenzene	: ACY, DUP, FST, MOB, RUC.
m-Nitrobenzenesulfonic acid	: TRC.
m-Nitrobenzenesulfonic acid, sodium salt	: USM.
o-Nitrobenzoic acid	: SAL.
m-Nitrobenzoic acid	: SAL, X.
p-Nitrobenzoic acid	: DUP.
m-Nitrobenzoic acid, sodium salt	: SAL.
2-Nitro-p-cresol	: SM.
4-Nitro-m-cresol	: MTP.
p-Nitro-N-(2-diethylamino)ethylbenzamide	: X.
Nitrodiphenylamine	: ACY, MON.
5-Nitro-2-furanmethanediol, diacetate	: NOR.
5-Nitroisophthalic acid	: SAL.
3-Nitro-4-methoxyacetanilide	: TRC.
1-Nitronaphthalene	: DUP.
3-Nitro-1,5-naphthalenedisulfonic acid	: TRC.
7(and 8)-Nitronaphth[1,2-d][1,2,3]oxadiazole-5-sulfonic acid	: FRC.
o-Nitrophenol	: TRC.
p-Nitrophenol	: MON.
p-Nitrophenol, sodium salt	: DUP, MON.
2-(o-Nitrophenylazo)-4,6-di-tert-pentylphenol (OH=1)	: DUP.
4-Nitro-o-phenylenediamine	: TRC.
4-Nitroso-N-ethyl-N-(β-methylsulfonamidoethyl)-m-toluidine	: FHT.
p-Nitrosophenol	: X.
4-Nitrosophenol, sodium salt	: LC, SDC, VPC.
N-Nitroso-N-phenylhydroxylamine, ammonium salt	: SDC.
4-Nitro-4-(5-sulfo-2H-naphthol[1,2-d]triazol-2-yl)-2,2'-stilbenedisulfonic acid	: FKE.
3-Nitro-p-toluamide	: TRC.
o-Nitrotoluene	: X.
m-Nitrotoluene	: DUP, FST.
p-Nitrotoluene	: DUP, FST.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Nitrotoluene mixtures	FST.
p-Nitrotoluene-o-sulfonic acid	AC, CGY, DUP, X.
5-Nitro-o-toluidine [NH <sub>2</sub> =1]	PCM.
4-Nitro-m-xylene	DUP.
Nonyl-dimnolphenol, mixture	USR.
* Nonylphenol	GAF, KLM, MCE, MON, RH, SCN, TX.
Octylphenol	GAF, KLM, MCE, MON, RH, SCN, TX.
Octylphenoxydiethoxy chloride	RH, SCN.
1-[(7-Oxo-7H-benz[de]lanthracene-3-yl)amino]-anthraquinone	RH.
5-oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	TRC.
4,4'-Oxydianiline	VPC.
Pentabromocyclohexane	DUP.
Pentabromoethylbenzene	DOM.
1,1,3,3,5-Pentamethylindan	TNR.
2-Pentylanthraquinone	GIV.
o-Pentylphenol (o-Amylphenol)	DUP.
p-tert-Pentylphenol	PAS.
3,4,9,10-Perylene-tetracarboxylic-3,4,9,10-dianhydride	PAS.
3,4,9,10-Perylene-tetracarboxylic-3,4,9,10-diamide	VPC.
2-Phenethylamine	SDC, VPC.
p-Phenetidine	HXL.
* PHENOL:	MON.
NATURAL:	
FROM COAL TAR:	
Phenol, natural, from coal tar, 39 degree C., m.p.	FER.
Phenol, natural, from coal tar, all other	KPT.
FROM PETROLEUM:	
Phenol, natural, from petroleum, U.S.P.	MER.
Phenol, natural, from petroleum, all other	DA, FER, NPC.
SYNTHETIC:	
BY CAUSTIC FUSION:	
Phenol, synthetic, by caustic fusion, U.S.P.	KCI.
Phenol, synthetic, by caustic fusion, all other	SW.
Phenol, benzylated	MIL.
Phenol, styrenated	MIL.
Phenol, synthetic, from chlorobenzene by vapor-phase hydrolysis, U.S.P.	SOC.
* Phenol, synthetic, from cumene by oxidation, U.S.P.	APP, CLK, DOM, GE, GP, MON, SHC, SKO, UCC, USS.

TABLE 2. --CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Phenol, synthetic, from toluene by oxidation, U.S.P. -----	---
Phenolsulfonaphthalein, sodium salt-----	KLM.
Phenolsulfonic acid, sodium salt-----	EK.
Phenoxyacetic acid, sodium salt-----	SAL, USS.
3-Phenoxybenzaldehyde-----	LIL.
3-Phenoxybenzenemethanol-----	GTL, TNA.
2-(Phenoxyethyl)benzoic acid-----	TNA.
Phenylacetic acid, ethyl ester, tech.-----	PFZ.
Phenylacetic acid, methyl ester-----	OPC.
Phenylacetic acid, potassium salt-----	OPC.
Phenylacetic acid, sodium salt-----	OPC, SFS.
Phenylacetoneitrile (α-Tolunitrile)-----	OPC.
Phenylacetyl chloride-----	OPC.
p-Phenylazoaniline (C.I. Solvent Yellow 1) and hydrochloride-----	TRC.
4-(phenylazodiphenylamine-----	EK.
2-Phenylbenzimidazole-----	SAL.
Phenyl-1,2,3-butanetrione-2-oxime-----	EK.
4-Phenyl-3-buten-2-one (Benzylidene acetone)-----	SDM.
1-Phenyl-4,4-dimethyl-3-pyrazolidinone-----	EK.
o-Phenylenediamine-----	DUP, SW, TRC.
m-Phenylenediamine-----	DUP.
p-Phenylenediamine-----	DUP, SDC.
p-Phenylethylamine-----	SDM.
Phenyl ether (Diphenyl oxide)-----	MON.
d(+)-2-Phenylethylamine-----	HXL.
dl-2-Phenylglycine (racemic)-----	BCC, KF.
d(-)-2-Phenylglycine-----	KF.
Phenylglycine, potassium salt-----	BCC.
Phenylglycine, sodium salt-----	LIL.
d(-)-2-Phenylglycyl chloride hydrochloride-----	KF, UPJ.
*2,2'-[(Phenylimino)diethanol (N-Phenyldiethanolamine)]-----	EKT, MIB, TCH.
2,2'-[(Phenylimino)diethanol, diacetate ester]-----	TCH.
Phenyl-α-naphthylamine-----	UCC.
o-Phenylphenol-----	DOH.
p-Phenylphenol-----	DOH.
o-Phenylphenol, sodium salt-----	DOH.
N-Phenyl-p-phenylenediamine-----	USF.
Phenylphosphinic acid-----	SFS.
Phenylphosphonoethic dichloride-----	SFA.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Phenylphosphorous dichloride	SFA.
1-Phenyl-1,2-propanedione, 2-oxime	ORI.
4-Phenylpropylpyridine	RIL.
dl-Phenylsuccinic acid	X.
4-Phenylsulfanyl-1,2-phenylenediamine	ARA.
4-Phenylthiomorpholine-1,1-dioxide	EKT.
Phenylundecanoic acid	EK.
1(2H)-Phthalazinone	X.
Phthalic acid	EK.
*Phthalic anhydride	ACS, BAS, ENJ, KPT, MON, SOC, STP, USS.
Phthalide	SOL.
Phthalimide	SM.
Phthalimidooacetic acid	X.
Phthalimidooacetyl chlorzide	X.
[Phthalocyaninato(2-)]copper	DUP, PHC.
Phthalocyaninetetrasulfonyl chloride, copper derivative	VPC.
Phthaloyl chloride (Phthalyl chloride)	TLC.
PICOLINES:	
Picoline (3,4-mixture)	KPT, RIL.
2-Picoline (α-picoline)	RIL.
3-Picoline (β-picoline)	MEP, RIL.
4-Picoline (γ-picoline)	RIL.
Picolinic acid	MEP.
Picolinnitrile	MEP.
3-Picolylamine (2-Cyanopyridine)	RIL.
Picric acid (Trinitrophenol)	SOC.
Piperidine	ABB, RIL, TX.
3-Piperidinopropiophenone hydrochloride	ACY.
Polychlorobenzene	DOM, SCC.
Polyethylbenzene (80 percent diethylbenzene)	ELP.
*Propiophenone	HEX, ORT, UCC.
PYRIDINE, REFINED:	
20 Pyridine, refined	KPT, MEP, RIL.
Pyridine, refined all other grades	RIL.
3-Pyridinemethanol	RIL.
2 Pyridinethiol-1-oxide, sodium salt	OMC.
2 Pyridinethiol-1-oxide, zinc salt	OMC.
2-Pyrimidinol	CGY.
2-Pyrolidinone	GAF.
Quinaldine	ACY.

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
QUINOLINE:	
Quinoline, 1 <sup>o</sup> and 2 <sup>o</sup>	KPT
2,4-Quinolinediol	FCM
Resorcinol, tech.	KPT
o-Resorcylic acid, lead salt	KPT
Salicylaldehyde	DOM, DUP, RDA
Salicylaldehyde oxime	EX
Salicylanilide	FCM
Salicylic acid, phenyl ester	DOM
*Salicylic acid, tech.	DOM, HN, MOK, SDH
*styrene (Vinylbenzene)	AMO, MTR, CRP, CSD, DOM, ELP, GOC, HST, HCB, MON, SHC, SUN, USS
Sulfanilic acid (p-Aminobenzenesulfonic acid) and salt	ACY, EK
5-Sulfoisophthalic acid, 1,3- imethyl ester, sodium salt	DUP
5-Sulfoisophthalic acid, sodium salt	FCM
4,4'-Sulfonyldiphenol (4,4'-Dihydroxydiphenyl sulfone)	UPF
4-Sulfoisophthalic acid	CMN
terephthalic acid	AMO, HCF
terephthalic acid, dimethyl ester	DUP, EKT, HCF
terephthaloyl chloride	DUP, TLC
Terphenyl (Phenylbiphenyl) (m-,o-,and p-isomers)	MON
Tetrabromophthalic anhydride	CTL, TMA, VEL
1,2,4,5-tetrachlorobenzene	DOM
1,2,4,5-tetrachloro-3-nitrobenzene	SDH
Tetrachlorophthalic anhydride	MON
2,3,5,6-tetrachloropyridine	DOM
tetrahydrobenzyl alcohol	UCC
tetrahydrofuran	DUP, GAF, QKO
1,2,3,4-tetrahydronaphthalene	UCC
1,2,3,4-tetrahydro-2,2,4,7-tetramethylquinoline	EKT
1,4,5,8-tetrahydroxyanthraquinone, leuco derivative	AC, TRC
1,2,3,5-tetramethylbenzene	SUN
1,2,4,5-tetramethylbenzene (Isodurene)	KHI, SUN
p-(1,1,3,3-tetramethylbutyl)phenol	GAF
tetrazolethiol	MRI
tetrahydrofurfurylamine	HXL
2-Thiophenecarboxaldehyde	EKT
Thiophenol	SFA
s-Thymol	GIV
Toluene-2,3-(and 3,4)-diamine (35/65 Mixture)	OMC
*Toluene-2,4-diamine (4-m-Tolylenediamine)	ACS, OMC, RUC, X

TABLE 2.--CYCLIC INTERMEDIATES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

CYCLIC INTERMEDIATES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Toluene-2,4-(and 2,6)-diamine (80/20 Mixture)	OMC.
Toluene-3,4-diamine	X.
p-Toluenesulfonic acid, sodium salt	NES.
p-Toluenesulfonic acid	TEN.
p-Toluenesulfonic acid, methyl ester	UPF.
p-Toluenesulfonic acid monohydrate	FMT.
p-Toluenesulfonic acid	NES.
p-Toluenesulfonyl chloride	MON.
p-Toluenesulfonyl chloride, ethyl ester	FMT.
p-Toluidine	DUP.
p-Toluidine	FST.
p-Toluidine	DUP.
p-Toluidine	DUP.
p-Toluidine, mixed-	DUP.
2-ortoluidinoethanol	ICH.
p-Toluoyl chloride	SDM.
2,2'-(m-tolylimino)diethanol	MLL, TCH.
2,2'-(m-tolylimino)diethanol, diacetate ester	SDC.
Tolytriazole	SM.
Triallyl trimellitate	FHP.
2,4,6-Triamino-5-nitrosopyrimidine	FNP.
2,4,6-Tribromophenol	SK.
3,4,5-Tribromosalicylanilide	GIL, VEL.
1,2,3(and 1,2,4)-Trichlorobenzene	PCM.
1,2,4-Trichlorobenzene	PPG, SCC.
1,2,4,5-Trichlorobenzene	DOM, SCC.
2,4,5-Trichlorobenzenesulfonic acid, sodium salt	UPF.
1,1,1-Trichloro-2,2-diphenylethane	CHN.
α,α-Trichloro-σ-fluorotoluene	OMC.
3-Trichloromethyl-1,2,4-thiadiazole	OMC.
1,2,4-Trichloro-5-nitrobenzene	PCM.
Trichlorophenylsilane	DCC.
α,α-Trichlorotoluene (Benzotrichloride)	HK, VEL.
2,4,6-Trichloro-s-triazine	CGY, DGC, NIL.
Tri(4aminophenyl)phenol	PEL.
α,α-Trifluoro-σ-toluidine	OMC.
α,α-Trifluoro-m-toluidine	OMC.
2,4,3-Trifluorodiphenyl-	PCM, PIT.
Trimesic acid	AMB.
3,4,5-Trimethoxybenzaldehyde	MON.
1,2,4-Trimethylbenzene (pseudocumene)	KHI, SUN.
1,3,5-Trimethylbenzene (Mesitylene)	KHI, SUN.
2,3,3-Trimethyl-3H-indole	VFC.
1,3,3-Trimethyl-6', α-indolineacetalddehyde	ATL, DUP, VPC.





TABLE 3.--CYCLIC INTERMEDIATES: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of cyclic intermediates to the U.S. International Trade Commission for 1981 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	FER	Ferro Corp.:
AC	American Color & Chemical Corp.		Ottawa Chemical Div.
ACS	Allied Corp., Allied Chemical Co.		Productol Chemical Div.
ACY	American Cyanamid Co.	FKE	Frank Enterprises, Inc.
AFP	Allied Corp., Fibers & Plastics Co., Div.	FMP	FMC Corp., Industrial Chemical Group
ALD	Aldrich Chemical Co., Inc.	FMT	Fairmount Chemical Co., Inc.
ALL	Alliance Chemical Corp.	FST	First Chemical Corp.
AMB	American Bio-Synthetics Corp.		
AMO	Standard Oil Co. (Indiana)	GAF	GAF Group
ARA	Araphahoe Chemicals, Inc., Sub/Syntex U.S.A., Inc.	GE	General Electric Co.
		GIV	Givaudan Corp.
ARK	Armstrong World Industries, Inc.	GLY	Glyco, Inc.
ARS	Arsynco, Inc.	GNW	Greenwood Chemical Co.
ARZ	Arizona Chemical Co.	GOC	Gulf Oil Corp., Gulf Oil Chemical Co.--U.S.
ASH	Ashland Oil, Inc.	GP	Georgia-Pacific Corp.:
ATL	Atlantic Chemical Corp.		Houston Div.
ATR	Atlantic Richfield Co., Arco Chemical Co.		Plaquemine Div.
		GRS	Champlin Petroleum Co.
BAS	BASF Wyandotte Corp. and Pigments Div.	GTL	Great Lakes Chemical Corp.
BCC	Buffalo Color Corp.	GYR	Goodyear Tire & Rubber Co.
BJL	Burdick & Jackson Laboratories, Inc.		
BKM	Buckman Laboratories, Inc.	HCF	Hercofina
BRD	Lonza, Inc.	HCR	Hercor Chemical Corp.
BUC	Synalloy Corp., Blackman-Uhler Chemicals Div.	HEX	Hexagon Laboratories, Inc.
		HK	Hooker Chemicals & Plastics Corp.
CCW	Carstab Corp.	HML	Hummel Chemical Co.
CEL	Celanese Corp., Celanese Chemical Co., Inc.	HN	Tenneco Chemicals, Inc.
CGY	Ciba-Geigy Corp.	HPC	Hercules, Inc.
CHL	Chemol, Inc.	HSH	Harshaw Chemical Co.
CHT	Chattem, Inc.	HST	American Hoechst Corp.:
CLK	Clark Oil & Refining Corp.		Industrial Chemicals Div.
CNP	Nipro, Inc.		Petrochemicals Div.
CO	Conoco, Inc.	HXL	Hexcel Corp., Hexcel Chemical Products
COS	Cosan Chemical Corp.		
CPI	Commonwealth Oil & Refining Co., Inc.	ICI	ICI Americas, Inc., Chemicals Specialties Co.
	Commonwealth Petrochemicals, Inc.		
CPS	CPS Chemical Co., Inc.	KF	Kay-Fries, Inc., Member Dynamit Nobel Group
CRB	Caribe Isoprene Corp.	KHI	Koch Industries, Inc., Koch Refining Co.
CRP	Corpus Christi Petrochemicals Co.	KLM	Kalama Chemical, Inc.
CRZ	Crown Zellenbach Corp.	KPT	Koppers Co., Inc.
CSD	Cosden Oil & Chemical Co.		
CWN	Upjohn Co., Fine Chemical Div.	LAK	Bofors Nobel, Inc. & Lakeway, Inc.
CXI	Chemical Exchange Industries, Inc.	LC	Lord Corp., Chemicals Products Group
		LEL	Leland Chemical Co.
DA	Diamond Shamrock Corp., Diamond Shamrock	LEM	Napp Chemicals, Inc.
	Agricultural Chemicals, Inc., Cresylic	LIL	Eli Lilly & Co., U.S. & Puerto Rico
	Plant		
DBC	Badische Co.	MAL	Mallinckrodt, Inc.
DCC	Dow Corning Corp.	MCB	Borg-Warner Corp., Borg-Warner Chemicals
DGC	Degussa Corp.	MER	Merichem Co.
DKA	Denka Chemical Corp.	MIL	Milliken & Co., Milliken Chemical Co.
DOW	Dow Chemical Co.	MLC	Melamine Chemicals, Inc.
DUP	E. I. duPont de Nemours & Co., Inc.	MOB	Mobay Chemical Co., Pittsburgh Div.
		MON	Monsanto Co.
EK	Eastman Kodak Co.:	MRT	Morton-Norwich Products, Inc., Morton Chemical
EKT	Tennessee Eastman Co. Div.		Co. Div.
ELP	El Paso Products Co.	MTO	Montrose Chemical Corp. of California
ENJ	Exxon Chemical Americas	MTP	Mount Pleasant Chemical Co.
ESX	Essex Industrial Chemicals, Inc., Essex		
	Chemical Corp.	NCL	Union Camp Corp., Terpene and Aromatics Div.
		NEP	Nepers Chemical Co., Inc.

TABLE 3.--CYCLIC INTERMEDIATES: DIRECTORY OF MANUFACTURERS, 1981--CONTINUED

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
NES	Ruetgers Nease Chemical Co.	SK	SmithKline Beckman Corp., SmithKline Chemicals Div.
NIL	Nilok Chemical, Inc.	SKO	Getty Refining & Marketing Co.
NOR	Morton-Norwich Products, Inc., Norwich Eaton Pharmaceutical Div.	SOC	Standard Oil Co. of California, Chevron Chemical Co.
NPC	Northwest Petrochemical Corp.	SOG	Charter International Oil Co.
OMC	Olin Corp.	SOI	Specialty Organics, Inc.
OPC	Orbia Products Corp.	SOL	Southland Corp., Fine Chemical Div.
ORO	Chevron Chemical Co.	STC	American Hoechst Corp., Sou-Tex Works
ORT	Roehr Chemicals, Inc.	STP	Stepan Chemical Co.
PAC	Pacific Anchor Chemical Corp.	STX	St. Croix Petrochemical Corp.
PAS	Pennwalt Corp.	SUN	Sun Company, Inc.
PCW	Pfister Chemical, Inc.	SW	Sherwin-Williams Co.
PD	Warner-Lambert Co.	SWC	Corco Cyclohexane, Inc.
PEL	Pelron Corp.	SWR	Southwestern Refining Co., Inc.
PFZ	Pfizer, Inc., & Pfizer Pharmaceuticals, Inc.	SYT	Synthron, Inc.
PHC	Phthalchem, Inc.	TCC	Sybron Corp., Chemical Division/Tanatex
PIT	Pitt-Consol Chemical Co.	TCH	Emery Industries, Inc., Tylon Div.
PLC	Phillips Petroleum Co.	TEN	Cities Service Co., Copperhill Operations
PPG	PPG Industries, Inc.	TLC	Twin Lake Chemical, Inc.
PPR	Phillips Puerto Rico Core, Inc.	TNA	Ethyl Corp.
PPX	Phillips Paraxylene, Inc.	TOC	Tenneco Oil Co., P & M
QKO	Quaker Oats Co.	TRC	Toms River Chemical Corp.
RBC	Fike Chemicals, Inc.	TRD	Squibb Manufacturing, Inc., Renesa, Inc., Ersana, Inc.
RDA	Rhone-Poulenc, Inc.	TRN	Trinity Chemical Corp.
REG	Regis Chemical Co.	TX	Texaco, Inc.
REL	Reliance Universal Inc., Louisville Resins Operations	UCC	Union Carbide Corp.
RH	Rohm & Haas Co.	UOC	Union Oil Co. of California
RIL	Reilly Tar & Chemical Corp.	UPF	Jim Walker Resources, Inc.
RSA	R.S.A. Corp.	UPJ	Upjohn Co.
RUC	Rubicon Chemicals, Inc.	USM	Crown Metro, Inc.
SAL	Salisbury Laboratories, Inc.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SCC	Standard Chlorine of Delaware, Inc.	USS	USS Chemicals Div. of U.S. Steel Corp.
SCM	SCM Corp., PCR Div.	VEL	Velsicol Chemical Corp.
SCN	Schenectady Chemicals, Inc.	VGC	Virginia Chemicals, Inc.
SDC	Martin-Marietta Corp., Sodyeco Div.	VIK	Viking Chemical Co.
SDH	Sterling Drug, Inc.	VPC	Mobay Chemical Corp., Dyestuff Div.
SDW	Hilton Davis Chemical Co. Div.	WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.
SFA	Sterling Organics Div.	WCC	White Chemical Corp.
SFC	Stauffer Chemical Co.	WTC	Witco Chemical Corp.
SFS	Agricultural Div.	WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.
SHC	Calbio Chemicals, Inc.		
	Specialty Div.		
	Shell Oil Co., Shell Chemical Co. Div.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table I of the appendix. The above codes identify those of the 194 reporting companies and company divisions for which permission to publish was not restricted.



## STATISTICAL HIGHLIGHTS

William Baker

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 domestic producers, collectively. The large number of dyes results from the many different types of materials to which dyes are applied, the different conditions of service for which dyes are required, and the cost that a particular use can bear. Dyes are sold as pastes, powders, lumps, and solutions; concentrations vary from 6 percent to 100 percent. The concentration, form and purity of dye are determined largely by the use for which it is intended.

Total domestic production of dyes in 1981 amounted to 230 million pounds, or 6.4 percent less than the 245 million pounds produced in 1980 (table 1). Sales of dyes in 1981 amounted to 219 million pounds, valued at \$773 million, compared with 227 million pounds, valued at \$791 million, in 1980. In terms of quantity, sales of dyes in 1981 were 3.8 percent less than in 1980 and in terms of value, 2.3 percent less. The average unit value of sales of all dyes in 1981 was \$3.53 per pound compared with \$3.48 per pound in 1980.

The production of three classes of dyes increased in 1981, while the remaining six major classes registered slight to moderate declines in their production. Direct dyes increased by 15.3 percent from 31.2 million pounds in 1980 to 36.0 million pounds in 1981; food, drug, and cosmetic colors increased by 9.7 percent from 6.1 million pounds in 1980 to 6.7 million pounds in 1981; fluorescent brightening agents increased by 1.2 percent from 37.9 million pounds in 1980 to 38.4 million in 1981.



TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1981

[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]

DYES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total-----	229,670	218,848	772,837	\$3.53
ACID DYES				
Total-----	24,520	24,455	106,973	4.37
Acid yellow dyes, total-----	5,894	6,490	22,687	3.50
Acid Yellow 17-----	117	134	656	4.89
Acid Yellow 19-----	93	98	369	3.76
Acid Yellow 23-----	140	126	585	4.62
Acid Yellow 36-----	222	220	733	3.33
Acid Yellow 49-----	631	...	...	...
Acid Yellow 151-----	1,495	2,083	4,982	2.39
Acid Yellow 174-----	...	24	104	4.33
All other-----	3,196	3,805	15,258	4.01
Acid orange dyes, total-----	5,111	5,553	16,152	2.91
Acid Orange 7-----	250	...	...	...
Acid Orange 10-----	148	155	644	4.16
Acid Orange 156-----	2,483	...	...	...
All other-----	2,230	5,398	15,508	2.87
Acid red dyes, total-----	4,358	3,769	24,103	6.40
Acid Red 1-----	197	189	799	4.21
Acid Red 4-----	32	40	236	5.97
Acid Red 73-----	93	93	516	5.54
Acid Red 88-----	83	67	371	5.53
Acid Red 114-----	...	142	739	5.22
Acid Red 137-----	218	185	1,500	8.11
Acid Red 151-----	270	255	874	3.43
Acid Red 266-----	...	464	2,278	4.91
Acid Red 337-----	688	454	3,333	7.33
All other-----	2,777	1,880	13,457	7.16
Acid violet dyes-----	81	106	757	7.17
Acid blue dyes-----	5,255	4,994	26,909	5.39
Acid green dyes, total-----	201	166	1,502	9.06
Acid Green 25-----	36	...	...	...
All other-----	165	166	1,502	9.06
Acid brown dyes, total-----	905	868	3,813	4.39
Acid Brown 14-----	288	263	1,153	4.38
All other-----	617	605	2,660	4.39
Acid black dyes, total-----	2,715	2,509	11,050	4.40
Acid Black 1-----	322	322	1,555	4.83
Acid Black 52-----	747	639	2,407	3.76
Acid Black 172-----	125	144	890	6.18
All other-----	1,521	1,404	6,198	4.41

See footnotes at end of table

TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1981--CONTINUED

DYES	PRODUCTION		SALES	
	1,000 pounds	1,000 pounds	QUANTITY	UNIT VALUE <sup>1</sup>
			1,000 dollars	per pound
<b>BASIC DYES (CLASSICAL AND MODIFIED)</b>				
Total-----	12,663	13,181	71,508	\$5.43
<b>Basic yellow dyes, total-----</b>				
Basic Yellow 11-----	347	336	1,104	3.28
Basic Yellow 13-----	142	181	809	4.48
Basic Yellow 29-----	...	395	940	2.38
Basic Yellow 79-----	...	356	1,372	3.85
All other-----	2,536	2,279	9,973	4.38
<b>Basic orange dyes, total-----</b>				
Basic Orange 2-----	443	398	1,322	3.32
All other-----	575	568	2,159	3.80
<b>Basic red dyes, total-----</b>				
Basic Red 12-----	147	131	945	7.21
Basic Red 14-----	376	601	1,358	2.26
Basic Red 15-----	...	223	791	3.54
Basic Red 49-----	111	95	525	5.55
All other-----	1,199	1,026	6,338	6.18
<b>Basic violet dyes, total-----</b>				
Basic Violet 1-----	2,392	2,143	5,362	2.50
Basic Violet 16-----	...	229	970	4.23
All other-----	922	926	4,982	5.38
<b>Basic blue dyes, total-----</b>				
Basic Blue 3-----	312	437	1,849	4.23
Basic Blue 41-----	336	296	1,723	5.83
All other-----	1,898	1,677	17,401	10.37
All other basic dyes-----	927	884	11,585	13.11
<b>DIRECT DYES</b>				
Total-----	35,991	31,780	90,147	2.84
<b>Direct yellow dyes, total-----</b>				
Direct Yellow 4-----	1,124	1,125	2,354	2.09
Direct Yellow 6-----	...	378	876	2.32
Direct Yellow 11-----	6,545	5,747	5,027	0.87
Direct Yellow 127-----	584	493	1,296	2.63
All other-----	8,663	6,714	19,803	2.95
<b>Direct orange dyes, total-----</b>				
Direct Orange 15-----	...	357	644	1.80
Direct Orange 39-----	157	132	507	3.86
Direct Orange 102-----	443	361	1,294	3.59
All other-----	748	308	1,411	4.58
<b>Direct red dyes, total-----</b>				
Direct Red 2-----	85	94	469	4.98
Direct Red 23-----	...	54	306	5.63
Direct Red 24-----	168	128	760	5.96
Direct Red 72-----	439	401	1,970	4.91
Direct Red 80-----	419	406	2,121	5.23
Direct Red 81-----	1,854	1,072	3,451	3.22
Direct Red 83-----	153	139	612	4.40
Direct Red 236-----	1,028	1,015	2,768	2.73
All other-----	2,088	2,125	6,960	3.27

See footnotes at end of table



TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1981--CONTINUED

DYES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
<b>DIRECT DYES--CONTINUED</b>				
Direct violet and green dyes, total-----	511	570	2,949	\$ 5.17
Direct Violet dyes-----	...	334	1,667	4.99
Direct Green dyes-----	...	236	1,282	5.43
Direct blue dyes, total-----	6,117	5,850	21,047	3.60
Direct Blue 1-----	...	84	526	6.25
Direct Blue 15-----	215	199	449	2.25
Direct Blue 80-----	327	297	1,155	3.89
Direct Blue 86-----	1,227	1,253	3,547	2.83
Direct Blue 120, 120:1, 120:2, and 120:3-----	113	119	869	7.30
All other-----	4,235	3,898	14,501	3.72
Direct brown dyes-----	567	471	2,226	4.73
Direct black dyes, total-----	4,298	3,840	11,296	2.94
Direct Black 22-----	1,195	1,103	1,971	1.79
All other-----	3,103	2,737	9,325	3.41
<b>DISPERSE DYES</b>				
Total-----	38,805	34,940	148,009	4.24
Disperse yellow dyes, total-----	4,922	4,209	16,795	3.99
Disperse Yellow 67-----	...	51	286	5.63
All other-----	4,922	4,158	16,509	3.97
Disperse orange dyes, total-----	4,870	4,767	13,566	2.85
Disperse Orange 3-----	...	53	225	4.23
Disperse Orange 25 and 25:1-----	418	464	1,476	3.18
Disperse Orange 29-----	...	499	1,578	3.16
Disperse Orange 44 and 44:1-----	168	...	...	...
All other-----	4,284	3,751	10,287	2.74
Disperse red dyes, total-----	8,028	7,783	41,053	5.27
Disperse Red 1-----	272	251	855	3.41
Disperse Red 17-----	...	179	600	3.35
Disperse Red 55-----	146	...	...	...
Disperse Red 65-----	224	...	...	...
Disperse Red 167 and 167:1-----	502	314	1,270	4.04
Disperse Red 177-----	854	921	3,675	3.99
Disperse Red 179-----	210	115	557	4.85
All other-----	5,820	6,003	34,096	5.68
Disperse violet dyes-----	432	444	2,205	4.97
Disperse blue dyes, total-----	17,804	15,156	64,129	4.23
Disperse Blue 3-----	943	901	3,972	4.41
Disperse Blue 79-----	8,164	7,318	17,598	2.40
All other-----	8,697	6,937	42,559	6.14
Disperse black, brown, and green dyes, total-----	2,749	2,581	10,261	3.98
Disperse Brown 1-----	1,174	1,100	3,435	3.12
All other-----	1,575	1,481	6,826	4.61

See footnotes at end of table

TABLE 1.--DYES: U.S. PRODUCTION AND SALES, 1981--CONTINUED

DYES	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	per pound
FLUORESCENT BRIGHTENING AGENTS				
Fluorescent brightening agents, total-----	38,380	38,263	63,979	\$1.67
Fluorescent Brightening Agent 28-----	662	748	1,772	2.37
All other fluorescent brightening agents-----	37,718	37,515	62,207	1.66
FOOD, DRUG, AND COSMETIC COLORS				
Total-----	6,666	6,060	56,282	9.29
<i>Food, Drug, and Cosmetic Dyes</i>				
Total-----	6,218	5,604	47,982	8.56
FD&C Blue No. 1-----	193	279	3,607	12.93
FD&C Red No. 3-----	546	559	7,838	14.03
FD&C Red No. 40-----	2,408	2,088	20,934	10.02
FD&C Yellow No. 5-----	1,616	1,368	7,743	5.66
FD&C Yellow No. 6-----	1,377	1,173	5,318	4.53
All other food, drug and cosmetic dyes-----	78	137	2,542	18.55
<i>Drug and Cosmetic and External Drug and Cosmetic Dyes</i>				
Total-----	448	456	8,299	18.19
D&C Orange 5-----	3	4	51	11.36
D&C Red No. 7-----	99	...	...	...
D&C Red No. 9-----	67	...	...	...
D&C Red No. 19-----	20	20	277	13.64
D&C Red No. 36-----	5	5	40	8.31
All other drug and cosmetic and external drug and cosmetic dyes-----	254	427	7,931	18.59
MORDANT DYES				
Total-----	375	315	1,626	5.16
SOLVENT DYES				
Total-----	10,296	7,188	28,936	4.03
Solvent yellow dyes, total-----	843	502	3,350	6.67
Solvent Yellow 14-----	148	145	599	4.12
All other-----	695	357	2,751	7.71
Solvent orange dyes-----	821	853	3,311	3.88
Solvent blue dyes-----	2,997	896	5,648	6.31
All other solvent dyes-----	5,635	4,937	16,627	3.37
VAT DYES				
Total-----	35,267	37,547	121,273	3.23
Vat orange dyes-----	592	938	6,671	7.11
Vat red dyes-----	378	601	8,744	14.55
Vat green dyes-----	1,482	1,791	5,488	3.07
All other vat dyes-----	32,815	34,217	100,370	2.93
All other dyes <sup>2</sup> -----	26,707	25,119	84,104	3.71

See footnotes at end of table

## Footnotes

<sup>1</sup>Calculated from unrounded figures.

<sup>2</sup>The data include azoic compositions, azoic coupling components, azoic diazo components (bases and salts), fiber-reactive 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, 1981

CLASS OF APPLICATION	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT <sup>1</sup> VALUE
	1,000	1,000	1,000	per
	pounds	pounds	dollars	pound
Total-----	229,670	218,848	772,837	\$3.53
Acid-----	24,520	24,455	106,973	4.37
Basic (Classical and modified)-----	12,663	13,181	71,508	5.43
Direct-----	35,991	31,780	90,147	2.84
Disperse-----	38,805	34,940	148,009	4.24
Fluorescent brightening agents-----	38,380	38,263	63,979	1.67
Food, drug, and cosmetic colors-----	6,666	6,060	56,282	9.29
Mordant-----	375	315	1,626	5.16
Solvent-----	10,296	7,188	28,936	4.03
Vat-----	35,267	37,547	121,273	3.23
All other <sup>2</sup> -----	26,707	25,119	84,104	3.71

<sup>1</sup>Calculated from unrounded figures.

<sup>2</sup>The data include azoic compositions, azoic coupling components, azoic diazo components (bases and salts), fiber-reactive 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 2. --DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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]

DYES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACID YELLOW DYES:		
* Acid yellow 3-		ACV.
Acid yellow 14		TRC.
* Acid yellow 17		ATL, CK, SDH, TRC.
* Acid yellow 19		AC, ATL, CK, ICI.
* Acid yellow 23		AC, ACY, BAS, CK, LVR, SDH, TRC, WJ.
Acid yellow 34		ATL.
* Acid yellow 36		AC, ATL, TRC, VPC.
Acid yellow 40		AC, TRC.
Acid yellow 42		AC.
* Acid yellow 49		ATL, CK, PDC, S, VPC.
Acid yellow 54		AC.
Acid yellow 59		BAS, VPC.
Acid yellow 65		TRC.
Acid yellow 73		SDH.
Acid yellow 76		TRC.
Acid yellow 79		VPC.
Acid yellow 99		TRC.
Acid yellow 114		TRC.
Acid yellow 121		ATL.
Acid yellow 127		CK, TRC.
Acid yellow 128		TRC.
Acid yellow 129		TRC.
Acid yellow 135		ICI.
Acid yellow 145		VPC.
* Acid yellow 151		AC, CK, DUP, TRC, VPC.
Acid yellow 159		CK, TRC.
Acid yellow 168		TRC.
* Acid yellow 178		AC, PDC, VPC.
Acid yellow 198		CK, DUP.
Acid yellow 199		ICI.
Acid yellow 200		CK.
Acid yellow 216		VPC.
Acid yellow 219		CK, TRC.
Acid yellow 221		BAS.
Acid yellow 392		VPC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACID DYES--CONTINUED	
*ACID YELLOW DYES--CONTINUED	
*Acid yellow dyes, all other--	AC, CK, DGO, VPC.
*ACID ORANGE DYES:	
Acid Orange 5--	ACY.
*Acid Orange 7--	AC, ACY, ATL, BAS, CK, TRC, VPC.
Acid Orange 8--	AC, ATL, CK, TRC, VPC.
*Acid Orange 10--	AC, ATL, BAS, CK, PDC, TRC.
Acid Orange 24--	ACY, S, TRC.
Acid Orange 47--	TRC.
Acid Orange 51--	AC, CK, TRC, VPC.
Acid Orange 60--	TRC.
Acid Orange 63--	ATL, TRC.
Acid Orange 64--	ACY, ATL.
Acid Orange 69--	TRC.
Acid Orange 74--	TRC.
Acid Orange 86--	AC, CK.
Acid Orange 116--	CK.
Acid Orange 128--	CK, DUP.
*Acid Orange 152--	CK, S, TRC.
Acid Orange 156--	ATL.
Acid Orange 161--	CK, TRC.
*Acid orange dyes, all other--	AC, ATL, BAS, CK, TRC.
*ACID RED DYES:	
*Acid Red 1--	AC, ATL, PDC, TRC.
*Acid Red 4--	ATL, BAS.
Acid Red 14--	ATL.
Acid Red 18--	ATL.
Acid Red 26--	SDH.
Acid Red 27--	CK, TRC.
Acid Red 57--	AC.
Acid Red 66--	ATL, BAS, PSC, TRC.
*Acid Red 73--	FAB.
Acid Red 85--	SDH.
*Acid Red 87--	ATL, BAS, PDC, TRC.
Acid Red 88--	ATL.
Acid Red 97--	FAB.
Acid Red 99--	AC, CK, TRC, VPC.
*Acid Red 114--	ATL.
Acid Red 115--	CK.
Acid Red 119--	TRC.
Acid Red 134--	AC, ATL, BAS, TRC, VPC.
*Acid Red 137--	AC, ACY, ATL, CK, TRC.
Acid Red 151--	

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACID DYES--CONTINUED	
*ACID RED DYES--CONTINUED	
Acid Red 167	: ATL, TRC.
Acid Red 174	: AC.
Acid Red 182	: AC, VPC.
Acid Red 183	: AC.
Acid Red 186	: AC.
Acid Red 194	: TRC.
Acid Red 211	: TRC.
Acid Red 213	: TRC.
Acid Red 226	: BAS.
Acid Red 237	: TRC.
*Acid Red 256	: ATL, CK, TRC, VPC.
Acid Red 278	: VPC.
Acid Red 299	: ATL, CK.
Acid Red 309	: TRC.
*Acid Red 337	: ATL, CK, S, TRC, VPC.
Acid Red 361	: TRC.
Acid Red 364	: CK.
Acid Red 384	: CK.
Acid Red 385	: AC.
Acid Red 388	: DUP.
Acid Red 396	: ICI.
Acid Red 408	: AC.
Acid Red 410	: ATL.
*Acid red dyes, all other	: AC, ATL, CK, EXT, TRC, VPC.
*ACID VIOLET DYES:	
Acid Violet 3	: ATL, TRC.
Acid Violet 7	: ATL.
Acid Violet 12	: AC, ATL.
Acid Violet 17	: SDH.
Acid Violet 43	: HSH.
Acid Violet 49	: SDH, TRC.
*ACID BLUE DYES:	
Acid Blue 9	: BAS, SDH, TRC, WJ.
Acid Blue 15	: BAS.
Acid Blue 25	: ATL, CK, ICI, TRC, VPC.
Acid Blue 27	: ATL.
Acid Blue 29	: PDC.
Acid Blue 40	: ATL.
Acid Blue 41	: ATL, S, TRC, VPC.
Acid Blue 45	: ATL.
Acid Blue 78	: TRC.
Acid Blue 80	: TRC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACID DYES--CONTINUED	
*ACID BLUE DYES--CONTINUED	
Acid blue 92	: ATL, FAB.
Acid blue 113	: AC, CK.
Acid blue 118	: AC.
Acid blue 145	: ATL, CK.
Acid blue 158, 158:1, and 158:2	: AC, TRC.
Acid blue 231	: TRC.
Acid blue 277	: CK.
Acid blue 298	: CK.
Acid blue 330	: ATL.
Acid blue dyes, all other	: AC, BAS, CK, TRC, VPC.
*ACID GREEN DYES:	
Acid green 1	: LVR.
Acid green 3	: TRC.
Acid green 5	: WJ.
Acid green 16	: TRC.
Acid green 20	: ATL, PDC, TRC.
Acid green 25	: CK, HSH, TRC.
Acid green 35	: TRC.
Acid green 70	: TRC.
*Acid green dyes, all other	: ATL, LVR, PDC, TRC, WJ.
*ACID BROWN DYES:	
Acid brown 14	: ATL, BAS, CK, FAB, S, TRC.
Acid brown 19	: TRC.
Acid brown 24	: FAB.
Acid brown 45	: TRC.
Acid brown 96	: PDC.
Acid brown 97	: ATL, FAB, PDC.
Acid brown 98	: ACY, ATL, CK, TRC.
Acid brown 147	: CK, TRC.
Acid brown 239	: CK, TRC.
Acid brown 264	: BAS.
Acid brown 355	: BAS.
Acid brown dyes, all other	: CK.
*ACID BLACK DYES:	
Acid black 1	: AC, ACY, ATL, BAS, CK, FAB, TRC.
Acid black 2	: ACY.
Acid black 24	: AC.
Acid black 52	: AC, ATL, CK, FAB, TRC.
Acid black 58	: TRC.
Acid black 60	: CK, TRC.
Acid black 63	: BAS.
Acid black 92	: ACY.
Acid black 107	: CK, TRC.



TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACID DYES--CONTINUED	
*ACID BLACK DYES--CONTINUED	
*Acid Black 172	ICI, TRC, VFC.
*Acid Black 194	BAS.
*Acid black dyes, all other	ATL, CK, TRC, VFC.
AZOIC DYES AND COMPONENTS	
AZOIC COMPOSITIONS:	
AZOIC YELLOW COMPOSITIONS:	
Azoic yellow 1	ALL, BUC.
Azoic yellow compositions, all other	BAS.
AZOIC ORANGE COMPOSITIONS:	
Azoic Orange 3	ALL, BUC.
Azoic orange compositions, all other	BAS, BUC.
AZOIC RED COMPOSITIONS:	
Azoic Red 1	ALL, BUC.
Azoic Red 2	ALL, BUC.
Azoic Red 6	ALL, BUC.
Azoic red compositions, all other	ALL, BUC.
AZOIC VIOLET COMPOSITIONS:	
Azoic violet 1	BUC.
Azoic violet compositions, all other	BUC.
AZOIC BLUE COMPOSITIONS:	
Azoic blue 3	ALL, BUC.
AZOIC BROWN COMPOSITIONS:	
Azoic brown 7	BUC.
Azoic brown 9	ALL, BUC.
Azoic brown compositions, all other	BUC.
AZOIC BLACK COMPOSITIONS:	
Azoic black 4	BUC.
AZOIC DIAZO COMPONENTS, BASES:	
Azoic Diazo Component 4, base	ALL, BUC.
Azoic Diazo Component 13, base	ALL, BUC.
Azoic Diazo Component 14, base	ALL.
Azoic Diazo Component 32, base	ALL.
Azoic Diazo Component 34, base	ALL.
AZOIC DIAZO COMPONENTS, SALTS:	
Azoic Diazo Component 1, salt	ALL, BUC.
Azoic Diazo Component 3, salt	ALL, BUC.
Azoic Diazo Component 5, salt	ALL, BUC.
Azoic Diazo Component 6, salt	ALL.
Azoic Diazo Component 8, salt	ALL, BUC.
Azoic Diazo Component 9, salt	ALL, BUC.
Azoic Diazo Component 10, salt	ALL, BUC.
Azoic Diazo Component 11, salt	ALL.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
AZOIC DYES AND COMPONENTS--CONTINUED	
AZOIC DIAZO COMPONENTS, SALTS--CONTINUED	
Azoic diazo Component 12, salt	ALL, BUC.
Azoic diazo Component 13, salt	ALL, BUC.
Azoic diazo Component 14, salt	ALL.
Azoic diazo Component 20, salt	ATL.
Azoic diazo Component 32, salt	ALL.
Azoic diazo Component 34, salt	ALL.
Azoic diazo Component 41, salt	ALL.
Azoic diazo Component 42, salt	ALL, ATL.
Azoic diazo Component 44, salt	ALL, BUC.
Azoic diazo Component 49, salt	ALL, ATL.
Azoic diazo components, salt, all other	ALL, ATL.
AZOIC COUPLING COMPONENTS:	
Azoic Coupling Component 2	PCM.
Azoic Coupling Component 3	PCM.
Azoic Coupling Component 7	PCM.
Azoic Coupling Component 8	PCM.
Azoic Coupling Component 11	PCM.
Azoic Coupling Component 12	PCM.
Azoic Coupling Component 14	BUC, PCM.
Azoic Coupling Component 17	PCM.
Azoic Coupling Component 18	PCM.
Azoic Coupling Component 20	PCM.
Azoic Coupling Component 21	BUC, PCM.
Azoic Coupling Component 29	BUC, PCM.
Azoic Coupling Component 34	PCM.
Azoic Coupling Component 35	PCM.
Azoic Coupling Component 43	BUC.
BASIC DYES (CLASSICAL AND MODIFIED)	
*BASIC YELLOW DYES:	
Basic Yellow 2	ACY.
Basic Yellow 11	ATL, CK, TRC, VPC.
Basic Yellow 12	VPC.
Basic Yellow 13	ATL, DUP, TRC, VPC.
Basic Yellow 15	DUP.
Basic Yellow 21	VPC.
Basic Yellow 25	BAS.
Basic Yellow 28	BAS, VPC.
Basic Yellow 29	ATL, BAS, CK, DUP, VPC.
Basic Yellow 37	ACY.
Basic Yellow 45	TRC.
Basic Yellow 49	BAS.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
BASIC DYES (CLASSICAL AND MODIFIED)--CONTINUED	
*BASIC YELLOW DYES--CONTINUED	
Basic Yellow 53--	: DUF.
Basic Yellow 59--	: DUF, VPC.
Basic Yellow 77--	: BAS.
Basic Yellow 78--	: ACY.
*Basic Yellow 79--	: BAS, CK, DUP.
Basic yellow dyes, all other	: X.
Basic yellow dyes, all other, modified	: BAS, CK, VPC.
*BASIC ORANGE DYES:	
Basic Orange 1--	: BAS, PSC, TRC.
*Basic Orange 2--	: ATL, BAS, CK, DUP, PSC, TRC, VPC.
Basic Orange 21--	: ATL, CK, TRC, VPC.
Basic Orange 26--	: DUP.
Basic Orange 28--	: VPC.
Basic orange dyes, all other	: X.
*BASIC RED DYES:	
Basic Red 12--	: ACY, ATL, VPC.
*Basic Red 14--	: ATL, BAS, CK, DUP, VPC.
Basic Red 15--	: ATL, BAS, CK, DUP.
Basic Red 18--	: ATL, DUP, VPC.
Basic Red 22--	: TRC.
Basic Red 23--	: VPC.
Basic Red 29--	: BAS.
Basic Red 46--	: TRC.
*Basic Red 49--	: BAS, CK, TRC, VPC.
Basic Red 51--	: BAS.
Basic Red 54--	: BAS.
Basic Red 73--	: CK, DUP.
Basic Red 104--	: CK.
Basic red dyes, all other	: X.
Basic red dyes, all other, modified	: BAS, DUP, VPC.
*BASIC VIOLET DYES:	
*Basic Violet 1--	: ACY, BAS, BCC, DSC.
Basic Violet 3--	: ACY, CK, DSC, DUP.
Basic Violet 4--	: DSC.
Basic Violet 10--	: ACY, BAS.
*Basic Violet 16--	: ATL, BAS, DUP, TRC, VPC.
Basic Violet 35--	: BAS.
Basic violet dyes, all other	: X.
*BASIC BLUE DYES:	
Basic Blue 1--	: SDH, VPC.
Basic Blue 2--	: DSC.
*Basic Blue 3--	: BAS, CK, DUP, TRC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
BASIC DYES (CLASSICAL AND MODIFIED)--CONTINUED	
*BASIC BLUE DYES--CONTINUED	
Basic Blue 7	: DSC, SDH.
Basic Blue 9	: DUP.
Basic Blue 11	: SDH.
Basic Blue 21	: DUP.
Basic Blue 22	: DUP.
Basic Blue 26	: DSC
Basic Blue 27	: VPC.
Basic Blue 35	: DUP.
Basic Blue 41	: BAS, TRC, VPC.
Basic Blue 45	: VPC.
Basic Blue 47	: VPC.
Basic Blue 54	: BAS.
Basic Blue 60	: BAS.
Basic Blue 69	: VPC.
Basic Blue 75	: EKT.
Basic Blue 76	: BAS.
Basic Blue 77	: DUP.
Basic Blue 94 and 94:1	: CK, DUP.
Basic Blue 140	: VPC.
Basic blue dyes, all other	: X.
Basic blue dyes, all other, modified	: BAS, CK, VPC.
BASIC GREEN DYES:	
Basic Green 1	: DSC.
Basic Green 4	: ACY, BAS, DSC.
Basic green dyes, all other	: X.
BASIC BROWN DYES:	
Basic Brown 1	: ACY, PSC, TRC.
Basic Brown 4	: ACY, BAS, PSC, TRC.
BASIC BLACK DYES:	
Basic black dyes, all other	: CK, X.
Basic black dyes, all other, modified	: CK, VPC.
DIRECT DYES	
*DIRECT YELLOW DYES:	
Direct Yellow 4	: ATT, BAS, CK, TRC, VPC.
Direct Yellow 5	: ACY, BAS.
Direct Yellow 6	: AC, ACY, BAS, DUP, VPC.
Direct Yellow 8	: ATT.
Direct Yellow 11	: AC, BAS, DUP, TRC, VPC.
Direct Yellow 12	: CK, TRC, VPC.
Direct Yellow 27	: ATT.
Direct Yellow 28	: ATT, CK, TRC.
Direct Yellow 34	: CK, TRC.



TABLE 2.--DYES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DIRECT RED DYES--CONTINUED		
*Direct Red 24-		AC, ATL, FAB, TRC.
Direct Red 24-		AC, ATL.
Direct Red 28-		FAB.
Direct Red 31-		ATL, TRC.
Direct Red 39-		ATL.
*Direct Red 62-		TRC.
Direct Red 72-		AC, BAS, CK, DUP, TRC.
Direct Red 73-		AC.
Direct Red 79-		CK, TRC.
*Direct Red 80-		AC, ATL, CK, TRC.
*Direct Red 81-		AC, ACY, ATL, BAS, CK, DUP, FAB, LVR, TRC, VPC.
*Direct Red 83-		AC, ATL, CK, FAB, TRC.
Direct Red 122		TRC.
Direct Red 149		ATL.
Direct Red 153		ATL.
Direct Red 209		TRC.
*Direct Red 236		AC, BAS, VPC.
Direct Red 238		DUP, VPC.
Direct Red 239		S, TRC.
Direct Red 254		VPC.
*Direct red dyes, all other		AC, ATL, CK, VPC.
DIRECT VIOLET DYES:		
Direct Violet 1-		VPC.
Direct Violet 2-		VPC.
Direct Violet 7-		ATL.
Direct Violet 9-		ATL.
Direct Violet 86		TRC.
Direct Violet 86		ATL.
Direct violet dyes, all other-		DUP, VPC.
DIRECT BLUE DYES:		
*Direct Blue 1-		AC, ATL, BAS, TRC.
Direct Blue 2-		FAB.
Direct Blue 8-		ATL.
Direct Blue 14		TRC, VPC.
*Direct Blue 15		AC, ATL, BAS, DUP, VPC.
Direct Blue 25		CK, TRC.
Direct Blue 71		CK.
Direct Blue 75		CK, S, TRC.
Direct Blue 76		AC, CK, TRC.
*Direct Blue 80		AC, ATL, CK, FAB, TRC.
*Direct Blue 86		AC, ATL, BAS, CK, DUP, FAB, TRC, VPC.
Direct Blue 91		TRC.





TABLE 2. --DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DIRECT DYES--CONTINUED		
*DIRECT BLACK DYES--CONTINUED		
Direct Black 19	---	TRC.
*Direct Black 42	---	AC, ATL, CK, TRC, VPC.
Direct Black 38	---	FAB.
Direct Black 78	---	AC.
Direct Black 80	---	AC, ATL, CK, FAB.
Direct Black 161	---	AC.
Direct Black 165	---	ATL.
Direct Black 170	---	ATL.
*Direct black dyes, all other	---	AC, ATL, CK, FAB, VPC.
DISPERSE DYES		
*DISPERSE YELLOW DYES:		
Disperse Yellow 3	---	AC, BAS, CK, FAB, TRC.
Disperse Yellow 43	---	ATL, CK, TRC.
Disperse Yellow 33	---	AC, TRC.
Disperse Yellow 34	---	AC, EKT.
Disperse Yellow 36	---	VPC.
Disperse Yellow 42	---	AC, SDG, TRC.
Disperse Yellow 54	---	BAS, TRC, VPC.
Disperse Yellow 56	---	BAS.
Disperse Yellow 58	---	BAS.
Disperse Yellow 64	---	BAS, TRC.
*Disperse Yellow 67	---	DUP, TRC, VPC.
Disperse Yellow 74	---	VPC.
Disperse Yellow 77	---	VPC.
Disperse Yellow 86	---	AC, EKT.
Disperse Yellow 88	---	EKT.
Disperse Yellow 93	---	VPC.
Disperse Yellow 99	---	EKT.
Disperse Yellow 108	---	EKT.
Disperse Yellow 114	---	HST.
Disperse Yellow 125	---	SDC.
Disperse Yellow 126	---	ICI.
Disperse Yellow 137	---	DUP.
Disperse Yellow 183	---	ICI.
Disperse Yellow 198	---	ICI.
Disperse Yellow 200	---	BAS.
Disperse Yellow 210	---	EKT.
Disperse Yellow 219	---	ICI.
Disperse Yellow 223	---	SDC.
*Disperse yellow dyes, all other	---	CK.
*DISPERSE ORANGE DYES:		
*Disperse Orange 3	---	BAS, CK, EKT, HST, VPC.
	---	AC, ATL, CK, FAB, TRC.

TABLE 2. --DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DISPERSE DYES--CONTINUED	
*DISPERSE ORANGE DYES--CONTINUED	
Disperse Orange 5	: ATL.
Disperse Orange 17	: AC.
Disperse Orange 21	: TRC.
*Disperse Orange 25 and 25.1	: ATL, CK, EKT, ICI, TRC, VPC.
*Disperse Orange 29	: AC, BAS, CK, HST, SDC, VPC.
Disperse Orange 30	: AC, ATL, BUC, S, TRC, VPC.
Disperse Orange 31	: BAS.
Disperse Orange 37	: AC, ATL, CK, EKT.
Disperse Orange 41	: AC, TRC.
*Disperse Orange 44 and 44.1	: AC, CK, S, TRC.
Disperse Orange 53	: TRC.
Disperse Orange 55	: BAS.
Disperse Orange 56	: TRC.
Disperse Orange 57	: EKT.
Disperse Orange 66	: VPC.
Disperse Orange 73	: AC, BAS.
Disperse Orange 88	: SDC.
Disperse Orange 89	: AC.
Disperse Orange 94	: SDC.
Disperse Orange 125	: SDC.
Disperse Orange 129	: DUP.
Disperse Orange 136	: EKT.
Disperse Orange 138	: EKT.
Disperse Orange 139	: ICI.
Disperse Orange 145	: EKT.
*Disperse orange dyes, all other	: BUC, CK.
*DISPERSE RED DYES:	
*Disperse Red 1	: AC, ATL, CK, EKT, TRC.
Disperse Red 4	: TRC.
Disperse Red 5	: AC, ATL, CK.
Disperse Red 9	: ATL.
Disperse Red 13	: ATL, BAS.
Disperse Red 15	: HSH, TRC.
*Disperse Red 17	: AC, ATL, CK, FAB, TRC.
Disperse Red 30	: EKT.
Disperse Red 35	: EKT.
Disperse Red 50	: CK, FAB, TRC.
*Disperse Red 55	: BAS, TRC, VPC.
Disperse Red 59	: BAS.
Disperse Red 60	: AC, BAS, FRC, VPC.
*Disperse Red 65	: AC, CK, EKT, TRC.
Disperse Red 73	: BAS, S.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DISPERSE DYES--CONTINUED		
*DISPERSE RED DYES--CONTINUED		
Disperse Red 82		TRC, VPC.
Disperse Red 86		EKT, TRC.
Disperse Red 88		EKT.
Disperse Red 90		VPC.
Disperse Red 91		BAS.
Disperse Red 105		VPC.
Disperse Red 108		VPC.
Disperse Red 117		EKT.
Disperse Red 118		BAS.
Disperse Red 128		TRC.
Disperse Red 133		VPC.
Disperse Red 135		AC, CK.
Disperse Red 136		EKT.
Disperse Red 137		EKT.
Disperse Red 151		TRC.
Disperse Red 153		SDC.
Disperse Red 159		VPC.
Disperse Red 167 and 167:1		BAS, CK, S, TRC.
Disperse Red 177		AC, BUC, CK, S, SDC, VPC.
Disperse Red 179		AC, BAS, CK, S.
Disperse Red 184		HST.
Disperse Red 195		SDC.
Disperse Red 207		AC.
Disperse Red 214		BAS.
Disperse Red 217		DUP.
Disperse Red 263		BAS.
Disperse Red 271		DUP.
Disperse Red 273		BAS, SDC.
Disperse Red 274		SDC.
Disperse Red 278		ICI.
Disperse Red 305		EKT.
Disperse Red 307		EKT.
Disperse Red 309		EKT.
Disperse Red 311		ICI.
Disperse Red 313		SDC.
Disperse Red 316		SDC.
Disperse Red 319		CK.
Disperse Red 325		AC, CK.
Disperse Red 333		SDC.
Disperse Red 338		EKT.
Disperse Red 339		EKT.
Disperse Red 340		EKT.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DISPERSE DYES--CONTINUED	
*DISPERSE RED DYES--CONTINUED	
Disperse Red 341	: EKT.
Disperse Red 345	: CK.
Disperse Red 350	: AC.
Disperse Red 351	: AC.
*Disperse red dyes, all other	: BUC, EKT, FAB, TRC, VPC.
*DISPERSE VIOLET DYES:	
Disperse Violet 1	: AC, HSH, TRC.
Disperse Violet 17	: VPC.
Disperse Violet 27	: AC.
Disperse Violet 28	: TRC.
Disperse Violet 33	: IGI.
Disperse Violet 36	: SDC.
Disperse Violet 40	: VPC.
Disperse Violet 48	: HST.
Disperse Violet 60	: SDC.
Disperse Violet 64	: DUP.
*DISPERSE BLUE DYES:	
*Disperse Blue 3-	: AC, EKT, FAB, HSH, TRC.
Disperse Blue 7-	: AC, TRC.
Disperse Blue 19	: TRC.
Disperse Blue 27	: EKT.
Disperse Blue 55	: TRC.
Disperse Blue 56	: VPC.
Disperse Blue 60	: BAS, TRC, VPC.
Disperse Blue 62	: EKT.
Disperse Blue 64	: AC, EKT, TRC.
Disperse Blue 73	: S.
Disperse Blue 77	: EKT.
*Disperse Blue 79	: AC, ATL, BAS, BUC, CK, EKT, HST, S, TRC, VPC.
Disperse Blue 81	: VPC.
Disperse Blue 87	: BAS.
Disperse Blue 94	: HST.
Disperse Blue 95	: HST.
Disperse Blue 102	: EKT.
Disperse Blue 109	: AC.
Disperse Blue 112	: EKT.
Disperse Blue 118	: EKT.
Disperse Blue 122	: IGI.
Disperse Blue 125	: TRC.
Disperse Blue 139	: VPC.
Disperse Blue 148	: BAS.
Disperse Blue 165	: HST, VPC.

TABLE 2. --DYES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
DISPERSE DYES--CONTINUED	
*DISPERSE BLUE DYES--CONTINUED	
Disperse Blue 177-	SDC.
Disperse Blue 183-	S.
Disperse Blue 192-	DUP.
Disperse Blue 200-	ICI.
Disperse Blue 281-	SDC, TRC.
Disperse Blue 284-	ICI.
Disperse Blue 291-	SDC.
Disperse Blue 333-	HST.
Disperse Blue 337-	EKT.
*Disperse blue dyes, all other-	ATL, BAS, BUC, CK, DUP, EKT, HST, TRC, VPC.
DISPERSE GREEN DYES:	
Disperse Green 7-	DUP.
Disperse Green 9-	ICI.
Disperse green dyes, all other	CK.
DISPERSE BROWN DYES:	
Disperse Brown 1-	AC, ATL, BUC, CK, HST, ICI, SDC, TRC.
Disperse Brown 2-	SDC.
Disperse Brown 10-	SDC.
Disperse Brown 18-	SDC.
Disperse Brown 22-	EKT.
Disperse brown dyes, all other	CK, EKT.
DISPERSE BLACK DYES:	
Disperse Black 1-	AC.
Disperse Black 9-	AC, EKT.
Disperse Black 33-	AC.
Disperse black dyes, all other	BAS, CK, VPC.
FIBER-REACTIVE DYES	
REACTIVE YELLOW DYES:	
Reactive Yellow 3-	TRC.
Reactive Yellow 6-	TRC.
Reactive Yellow 7-	ICI.
Reactive Yellow 15-	HST.
Reactive Yellow 17-	HST.
Reactive Yellow 18-	ICI.
Reactive Yellow 22-	ICI.
Reactive Yellow 25-	VPC.
Reactive Yellow 27-	VPC.
Reactive Yellow 37-	HST.
Reactive Yellow 42-	HST.
Reactive Yellow 57-	HST.
Reactive Yellow 81-	TRC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
REACTIVE DYES--CONTINUED	
REACTIVE YELLOW DYES--CONTINUED	
Reactive yellow 86	ICI.
Reactive yellow 133	ICI.
Reactive yellow 135	ICI.
Reactive yellow dyes, all other	HST.
REACTIVE ORANGE DYES:	
Reactive Orange 1	ICI.
Reactive Orange 4	ICI.
Reactive Orange 12	ICI.
Reactive Orange 13	ICI.
Reactive Orange 14	ICI.
Reactive Orange 16	HST.
Reactive Orange 64	VPC.
Reactive Orange 70	TRC.
Reactive Orange 78	HST.
Reactive Orange 84	ICI.
Reactive Orange 86	ICI.
Reactive orange dyes, all other	HST.
REACTIVE RED DYES:	
Reactive Red 2	FAB, ICI.
Reactive Red 8	ICI.
Reactive Red 11	FAB, ICI.
Reactive Red 29	ICI.
Reactive Red 31	ICI.
Reactive Red 33	ICI.
Reactive Red 41	VPC.
Reactive Red 43	CK, ICI, TRC.
Reactive Red 49	HST.
Reactive Red 105	HST.
Reactive Red 106	HST.
Reactive Red 120	HST.
Reactive Red 123	CK, ICI, TRC.
Reactive Red 141	VPC.
Reactive Red 180	HST.
Reactive Red 181	HST.
Reactive Red 186	ICI.
REACTIVE VIOLET DYES:	
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.

TABLE 2. --DYES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1961--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
REACTIVE DYES--CONTINUED	
REACTIVE BLUE DYES--CONTINUED	
Reactive Blue 7-	TRC.
Reactive Blue 13	ICI.
Reactive Blue 19	HST.
Reactive Blue 21	HST, VPC.
Reactive Blue 29	VPC.
Reactive Blue 38	HST.
Reactive Blue 71	ICI.
Reactive Blue 89	HST.
Reactive Blue 109	ICI.
Reactive Blue 137	TRC.
Reactive Blue 171	ICI.
Reactive Blue 173	ICI.
Reactive Blue 174	ICI.
Reactive Blue 189	ICI.
Reactive blue dyes, all other-	HST, ICI.
Reactive Green 19	ICI.
Reactive green dyes, all other	HST.
REACTIVE BROWN DYES:	
Reactive Brown 10	ICI.
Reactive Brown 17	HST.
Reactive Brown 18	ICI.
Reactive Brown 30	HST.
REACTIVE BLACK DYES:	
Reactive Black 5	HST.
Reactive Black 9	ICI.
Reactive black dyes, all other	HST.
FLUORESCENT BRIGHTENERS	
Fluorescent Brightener 22	GGY.
Fluorescent Brightener 24	GGY.
*Fluorescent Brightener 28	CCM, GGY, SDH, VPC.
Fluorescent Brightener 46	GGY.
Fluorescent Brightener 49	S.
Fluorescent Brightener 52	S.
Fluorescent Brightener 59	GGY.
Fluorescent Brightener 61	ACY, CCM.
Fluorescent Brightener 71	GGY, DGO.
Fluorescent Brightener 102	GGY.
Fluorescent Brightener 126	SDH.
Fluorescent Brightener 128	SDH.
Fluorescent Brightener 130	SDH.
Fluorescent Brightener 134	GGY, S.



TABLE 2.--DYES FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
FLUORESCENT BRIGHTENERS--CONTINUED	
Fluorescent Brightener 135	CGY, CK.
Fluorescent Brightener 148	VPC.
Fluorescent Brightener 185	PRC.
Fluorescent Brightener 191	VPC.
Fluorescent Brightener 200	VPC.
*Fluorescent brighteners, all other	ACY, CGY, S, VPC, X.
FOOD, DRUG, AND COSMETIC COLORS	
*FOOD, DRUG, AND COSMETIC DYES:	
Food, Drug, and Cosmetic Blue 1	CK, KON, SDH, WJ.
Food, Drug, and Cosmetic Blue 2	BCC, KON, SDH, WJ.
*Food, Drug, and Cosmetic Green 3	WJ.
Food, Drug, and Cosmetic Red 2	WJ.
Food, Drug, and Cosmetic Red 3	CK, KON, SDH, STG, WJ.
Food, Drug, and Cosmetic Red 4	CK, WJ.
*Food, Drug, and Cosmetic Red 40	BCC, CK, KON, SDH, WJ.
*Food, Drug, and Cosmetic Yellow 5	BCC, CK, KON, SDH, STG, WJ.
*Food, Drug, and Cosmetic Yellow 6	BCC, CK, KON, STG, WJ.
*DRUG AND COSMETIC DYES:	
Drug and Cosmetic Green 5	BCC, KON.
Drug and Cosmetic Green 6	KON.
Drug and Cosmetic Green 8	SDH.
*Drug and Cosmetic Orange 4	BCC, KON.
*Drug and Cosmetic Orange 5	MRX, SDH, SNA, TMS.
Drug and Cosmetic Orange 17	SNA.
Drug and Cosmetic Red 3	KON.
Drug and Cosmetic Red 6	KON, SNA.
*Drug and Cosmetic Red 7	KON, SNA, TMS.
Drug and Cosmetic Red 8	KON, SNA.
*Drug and Cosmetic Red 9	KON, MRX, SNA, TMS.
*Drug and Cosmetic Red 17	KON.
*Drug and Cosmetic Red 19	BCC, KON, MRX, SNA, TMS.
Drug and Cosmetic Red 21	SNA.
Drug and Cosmetic Red 22	SDH.
Drug and Cosmetic Red 27	SDH, TMS.
Drug and Cosmetic Red 28	SDH.
Drug and Cosmetic Red 30	KON, SNA.
Drug and Cosmetic Red 33	BCC, KON.
*Drug and Cosmetic Red 34	KON, SNA.
*Drug and Cosmetic Red 36	KON, SDH, SNA, TMS.
Drug and Cosmetic Red 37	BCC, KON.
Drug and Cosmetic Violet 2	BCC, KON.
Drug and Cosmetic Yellow 5	KON, TMS.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1961--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 Yellow 7	SDH.
Drug and Cosmetic Yellow 8	KON, SDH, TMS.
Drug and Cosmetic Yellow 10	BCC, KON, WJ.
Drug and Cosmetic Yellow 11	KON.
DRUG AND COSMETIC DYES, EXTERNAL:	
External Drug and Cosmetic Orange 3	KON.
MORDANT DYES	
MORDANT YELLOW DYES:	
Mordant Yellow 1	PDC.
Mordant Yellow 8	PDC.
MORDANT ORANGE DYES:	
Mordant Orange 1	PDC.
Mordant Orange 6	PDC, TRC.
Mordant Orange 8	PDC.
MORDANT RED DYES:	
Mordant Red 7	AC, ATL.
Mordant Red 11	ACY, VPC.
MORDANT BROWN DYES:	
Mordant Brown 1	TRC.
Mordant Brown 18	PDC.
Mordant Brown 33	PDC.
Mordant Brown 70	PDC.
MORDANT BLACK DYES:	
Mordant Black 11	AC, TRC.
SOLVENT DYES	
*SOLVENT YELLOW DYES:	
Solvent Yellow 3	PSC.
Solvent Yellow 13	ACY.
Solvent Yellow 14	ATL, HRT, PSC, VPC.
Solvent Yellow 16	PSC.
Solvent Yellow 18	HRT.
Solvent Yellow 30	PSC.
Solvent Yellow 33	BCC.
Solvent Yellow 40	AC, ACY.
Solvent Yellow 42	ATL, BCC.
Solvent Yellow 43	DGO, HRT.
Solvent Yellow 44	DGO.
Solvent Yellow 47	ACY, DUP.
Solvent Yellow 56	ACY, PSC.
Solvent Yellow 71	ACY.
Solvent Yellow 72	AC, ACY.
Solvent Yellow 77	AC, ACY.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
SOLVENT DYES--CONTINUED	
*SOLVENT YELLOW DYES--CONTINUED	
Solvent yellow 94	SDH.
Solvent yellow 107	MRT.
Solvent yellow 131	DGO.
Solvent yellow 135	DGO.
Solvent yellow 143	MRT.
Solvent yellow 161	MRT.
Solvent yellow dyes, all other	AC, DGO.
*SOLVENT ORANGE DYES:	
Solvent orange 3	ACY, ATL, BAS, PSC.
Solvent orange 7	ATI, PSC.
Solvent orange 20	BAS.
Solvent orange 23	ATI, BCC.
Solvent orange 25	ACI, DUP.
Solvent orange 31	PSC.
Solvent orange 60	AC.
Solvent orange 73	MRT.
Solvent orange 74	MRT.
Solvent orange 75	MRT.
Solvent orange 76	MRT.
Solvent orange 77	MRT.
Solvent orange 96	MRT.
Solvent orange 97	MRT.
Solvent orange dyes, all other	PSC.
SOLVENT RED DYES:	
Solvent red 1	ATI, PSC.
Solvent red 5	ATI.
Solvent red 23	PSC.
Solvent red 24	AC, ACY, ATL, PSC.
Solvent red 26	ACY, PSC.
Solvent red 27	PSC.
Solvent red 30	PSC.
Solvent red 33	DUP.
Solvent red 43	SDH.
Solvent red 49	ACI, BAS.
Solvent red 68	ATI, BCC, MRT.
Solvent red 74	ATI, BCC.
Solvent red 111	AC, ACY.
Solvent red 164	MRT.
Solvent red 165	MRT.
Solvent red 166	MRT.
Solvent red 168	MRT.
Solvent red 169	MRT.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES

MANUFACTURERS' IDENTIFICATION CODES  
(ACCORDING TO LIST IN TABLE 3)

SOLVENT DYES--CONTINUED

SOLVENT RED DYES--CONTINUED

Solvent Red 172 - - - - - MRT.  
 Solvent Red 173 - - - - - MRT.  
 Solvent Red 175 - - - - - MRT.  
 Solvent Red 207 - - - - - MRT.  
 Solvent Red 208 - - - - - MRT.  
 Solvent Red 209 - - - - - MRT.  
 Solvent Red 210 - - - - - MRT.  
 Solvent red dyes, all other - - - - - AC.

SOLVENT VIOLET DYES:

Solvent Violet 8 - - - - - DSC.  
 Solvent Violet 9 - - - - - DSC.  
 Solvent Violet 13 - - - - - AC, HSH, MRT.  
 Solvent Violet 38 - - - - - MRT.

\*SOLVENT BLUE DYES:

Solvent Blue 3 - - - - - ACY, SM.  
 Solvent Blue 4 - - - - - DSC, SDH.  
 Solvent Blue 5 - - - - - DSC.  
 Solvent Blue 23 - - - - - BAS.  
 Solvent Blue 35 - - - - - MRT.  
 Solvent Blue 36 - - - - - MRT.  
 Solvent Blue 37 - - - - - DUP.  
 Solvent Blue 38 - - - - - DUP, TNI, X.  
 Solvent Blue 43 - - - - - ATL.  
 Solvent Blue 58 - - - - - ACY, VPC.  
 Solvent Blue 59 - - - - - AC, ACY, VPC.  
 Solvent Blue 98 - - - - - MRT.  
 Solvent Blue 99 - - - - - MRT.  
 Solvent Blue 100 - - - - - MRT.  
 Solvent Blue 128 - - - - - MRT.  
 Solvent Blue 129 - - - - - MRT.  
 Solvent blue dyes, all other - - - - - HSH.

SOLVENT GREEN DYES:

Solvent Green 1 - - - - - DSC.  
 Solvent Green 3 - - - - - HSH.

SOLVENT BROWN DYES:

Solvent Brown 12 - - - - - PSC.  
 Solvent Brown 20 - - - - - ACY, DUP.  
 Solvent Brown 22 - - - - - PSC.  
 Solvent Brown 52 - - - - - MRT.  
 Solvent brown dyes, all other - - - - - PSC.

SOLVENT BLACK DYES:

Solvent Black 5 - - - - - ACY.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
-----	
DYES	
-----	
SOLVENT DYES--CONTINUED	
-----	
SOLVENT BLACK DYES--CONTINUED	
Solvent black 7-	ACV, PSC.
Solvent black 13	ATL, BCC.
Solvent black 26	ATL.
Solvent black 48	MRT.
Solvent black dyes, all other-	DUP, PSC.
-----	
SULFUR DYES	
-----	
SULFUR YELLOW DYES:	
Leuco Sulfur Yellow 1-	SDC.
Leuco Sulfur Yellow 17	SDC.
Leuco Sulfur Yellow 21	SDC.
Leuco Sulfur Yellow 22	SDC.
SULFUR ORANGE DYES:	
Leuco Sulfur Orange 1-	SDC.
SULFUR RED DYES:	
Leuco Sulfur Red 14-	SDC.
Sulfur Red 10-	SDC.
SULFUR BLUE DYES:	
Leuco Sulfur Blue 7-	SDC, VPC.
Leuco Sulfur Blue 13	SDC, VPC.
Sulfur Blue 1-	VPC.
Sulfur Blue 7-	ACV.
Sulfur blue dyes, all other-	VPC.
SULFUR GREEN DYES:	
Leuco Sulfur Green 2	SDC.
Leuco Sulfur Green 3	SDC.
Leuco Sulfur Green 16	SDC.
Leuco Sulfur Green 34	SDC.
Leuco Sulfur Green 35-	SDC.
Leuco Sulfur Green 36-	SDC.
Sulfur green dyes, all other	SDC.
SULFUR BROWN DYES:	
Leuco Sulfur Brown 1	SDC.
Leuco Sulfur Brown 3	SDC.
Leuco Sulfur Brown 10-	SDC.
Leuco Sulfur Brown 31-	SDC.
Leuco Sulfur Brown 37	SDC.
Leuco Sulfur Brown 52	SDC.
Leuco Sulfur Brown 95-	SDC.
Leuco Sulfur Brown 96	SDC.
Sulfur Brown 96--	SDC.
Sulfur brown dyes, all other	SDC, VPC.

TABLE 2. --DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
SULFUR DYES--CONTINUED	
SULFUR BLACK DYES:	
Leuco Sulfur black 1	SDC.
Leuco Sulfur black 2	SDC.
Leuco Sulfur black 10	ACY.
Leuco Sulfur black 11	SDC.
Leuco Sulfur black 11-1	SDC.
Leuco Sulfur black 18	SDC.
Solubilized Sulfur Black 1	SDC.
Sulfur Black 1	SDC.
Sulfur Black 2	SDC.
Sulfur Black 11	SDC.
Sulfur Black 11-1	SDC.
Sulfur black dyes, all other	VFC.
VAT DYES	
VAT YELLOW DYES:	
Vat Yellow 2, 8-1/2%	AC, TRC, VFC.
Vat Yellow 22, 10%	VFC.
Vat Yellow 33, 15%	TRC.
Vat yellow dyes, all other	VFC.
*VAT ORANGE DYES:	
Vat Orange 1, 20%	TRC, VFC.
Vat Orange 2, 12%	ACT, BAS, TRC.
Vat Orange 4, 6%	DUP.
Vat Orange 5, 10%	HST.
Vat Orange 7, 11%	HST.
Vat Orange 9, 12%	TRC.
Vat Orange 15, 10%	TRC, VFC.
Vat orange dyes, all other	CK.
**VAT RED DYES:	
Vat Red 1, 13%	ACY, HST.
Vat Red 10, 18%	BAS.
Vat Red 13, 11%	TRC.
Vat Red 14, 10%	HST.
Vat Red 15, 10%	HST, TRC.
Vat Red 29, 18%	SDC.
Vat Red 32, 20%	BAS.
VAT VIOLET DYES:	
Vat Violet 1, 11%	TRC.
Vat Violet 2, 20%	HST.
Vat Violet 13, 6-1/4%	BAS, TRC.
Vat Violet 21	VFC.
VAT BLUE DYES:	
Vat Blue 1, 20%	BAS, BCC.

TABLE 2.--DYES FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

DYES	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
VAT DYES--CONTINUED	
VAT BLUE DYES--CONTINUED	
Vat Blue 6, 8-1/3%	BAS, TRC.
Vat Blue 16, 16%	BAS, TRC.
Vat Blue 18, 13%	AC, ACY, TRC.
Vat Blue 19	BAS.
Vat Blue 20, 14%	AC, ACY, TRC.
Vat Blue 43	SDC.
Vat Blue 66	BAS.
Vat blue dyes, all other	BCC, CK.
*VAT GREEN DYES:	
Vat Green 1, 6%	BAS, TRC.
Vat Green 3, 10%	ACY, BAS, TRC.
Vat Green 7	SDC.
Vat Green 9, 12-1/2%	TRC.
Vat Green 32	VPC.
Vat green dyes, all other	CK.
VAT BROWN DYES:	
Vat Brown 1, 11%	TRC, VPC.
Vat Brown 3, 11%	ACY, TRC, VPC.
Vat Brown 5, 13%	ACY, VPC.
Vat Brown 11, 12%	TRC.
Vat Brown 13, 17%	TRC.
Vat Brown 57, 12.8%	HST.
Vat Brown 380	VPC.
Vat brown dyes, all other	AC, ACY, CK, TRC, VPC.
VAT BLACK DYES:	
Vat Black 16	BCC, TRC.
Vat Black 23, 19%	ACY, TRC.
Vat Black 25, 12-1/2%	ACY, TRC.
Vat Black 27, 12-1/2%	TRC.
Vat black dyes, all other	AC, ACY, CK.
MISCELLANEOUS DYES:	
Dyes, all other	ALL, DUP.



TABLE 3.--DYES: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of dyes to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
AC	American Color & Chemical Corp.	KON	H. Kohnstamm & Co., Inc.
ACY	American Cyanamid Co.		
ALL	Alliance Chemical Corp.	LVR	C. Lever Co., Inc.
ATL	Atlantic Chemical Corp.		
		MRT	Morton Norwich Products, Inc., Morton Chemical Div.
BAS	BASF Wyandotte Corp. & Pigments Div.	MRX	Max Marx Color & Chemical Co.
BCC	Buffalo Color Corp.		
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	PCW	Pfister, Inc.
		PDC	Berncolora-Poughkeepsie, Inc.
CCW	Carstab Corp.	PSC	Passaic Color & Chemical Co.
CGY	Ciba-Geigy Corp.		
CK	Crompton & Knowles Corp., Dyes & Chemical Div.	S	Sandoz, Inc., Colora & Chemicals Div.
		SDC	Martin-Marietta Corp., Sodyeco Div.
DGO	Day-Glo Color Corp.	SDH	Sterling Drug, Inc., Hilton Davis Chemical Co. Div.
DSC	Dye Specialties, Inc.	SNA	Sun Chemical Corp.
DUP	E. I. duPont de Nemours & Co., Inc.	STG	McCormick & Co., Inc., McCormick/Stange Flavor Div.
EKT	Eastman Kodak Co., Tennessee Eastman Co. Div.	SW	Sherwin-Williams Co.
PAB	Fabricolor Manufacturing Corp.		
		TMS	Sterling Drug, Inc., Thomasset Colora Div.
HSH	Harshaw Chemical Co.	TNI	Gillette Co., Chemical Div.
HST	American Hoechst Corp., Industrial Chemicals Div.	TRC	Toms River Chemical Corp.
ICI	ICI Americas, Inc., Chemical Specialties Co.	VPC	Mobay Chemical Corp., Dyestuff Div.
		WJ	Warner-Jenkinson Co.

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



## STATISTICAL HIGHLIGHTS

William Baker

Organic pigments are toners and lakes<sup>1</sup> derived in whole or in part from benzenoid chemicals and colors.

Statistics on production and sales of all organic pigments in 1981 are given in table 1.<sup>2</sup> 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 1981 was 75.8 million pounds--9.3 percent more than the 69.4 million pounds produced in 1980. Total sales of organic pigments in 1981 amounted to 64.1 million pounds, valued at \$415.3 million compared with 60.8 million pounds, valued at \$361.3 million, in 1980. In terms of quantity, sales of organic pigments in 1981 were 5.4 percent higher than in 1980; in terms of value, sales in 1981 were 14.9 percent higher than in 1980.

Production of toners in 1981 amounted to 75.0 million pounds--9.4 percent more than the 68.5 million pounds reported in 1980. Sales in 1981 were 63.5 million pounds, valued at \$412.6 million, compared with 60.2 million pounds, valued at \$358.7 million, in 1980. Sales in 1981 were 5.5 percent higher than those of 1980 in terms of quantity, and 15.0 percent higher in terms of value. The individual toners listed in the report which were produced in the largest quantities in 1981 were Pigment Yellow 12, 11.6 million pounds; Pigment Blue 15:3, beta form, 8.5 million pounds; Pigment Red 49:1; barium toner, 5.8 million pounds; Pigment Red 57:1, calcium toner, 5.4 million pounds; Pigment Red 53:1, barium toner, 4.3 million pounds; and Pigment Yellow 14, 3.7 million pounds.

Production of lakes totaled 815,000 pounds in 1981--1.4 percent less than the 827,000 pounds reported for 1980. Sales of lakes in 1981 amounted to 552,000 pounds, valued at \$2.8 million. In terms of quantity, sales of lakes in 1981 were 5.5 percent less than in 1980; in term of value, sales in 1981 were 6.0 percent higher than in 1980.

For each of 14 selected pigments, or groups of pigments, table 1A gives data on sales by commercial forms. Pigment Yellow 14, Pigment Red 3, Pigment Red 48:2, calcium, Pigment Red 49:1, barium, Pigment Blue 15:1 and 15:2, alpha forms, and Pigment Green 7 were sold principally in the dry full-strength form. Pigment Yellow 12, Pigment Red 53:1, barium, Pigment Red 57:1, calcium and Pigment Blue 15:3, beta form were sold principally in the flushed form.

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

<sup>2</sup>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, 1981

[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 or where no data were reported.) Table 2 lists all organic pigments for which data on production and/or sales were reported and identifies the manufacturers of each]

ORGANIC PIGMENTS	PRODUCTION		SALES	
	QUANTITY	VALUE <sup>1</sup>	QUANTITY	UNIT VALUE <sup>2</sup>
	1,000 pounds dry basis <sup>3</sup>	1,000 pounds dry basis <sup>3</sup>	1,000 dollars	Per pound
Grand total-----	75,795	64,067	415,320	\$6.48
TONERS				
Total-----	74,980	63,515	412,561	6.50
Yellow toners, total-----	20,526	16,667	90,271	5.42
Acetoacetarylide yellows:				
Pigment Yellow 1, C.I. 11 680-----	271	242	1,323	5.46
Pigment Yellow 3, C.I. 11 710-----	109	128	726	5.67
Pigment Yellow 65 C.I. 11 740-----	196	168	1,363	8.11
Pigment Yellow 73, C.I. 11 738-----	306	396	1,941	4.90
Pigment Yellow 74, C.I. 11 741-----	1,124	1,050	8,274	7.88
Diarylide yellows:				
Pigment Yellow 12, C.I. 21 090-----	11,632	8,806	39,181	4.45
Pigment Yellow 13, C.I. 21 100-----	729	613	3,605	5.88
Pigment Yellow 14, C.I. 21 095-----	3,667	2,975	14,504	4.88
Pigment Yellow 17, C.I. 21 105-----	746	609	3,702	6.11
Pigment Yellow 83, C.I. 21 108-----	914	896	8,249	9.21
All other-----	832	784	7,385	9.42
Orange toners, total-----	2,164	2,083	12,855	6.17
Pigment Orange 5, C.I. 12 075-----	828	812	3,590	4.42
Pigment Orange 13, C.I. 21 110-----	197	192	1,448	7.52
Pigment Orange 16, C.I. 21 160-----	645	572	3,646	6.37
Pigment Orange 34, C.I. 21 115-----	71	75	556	7.40
All other-----	423	432	3,615	8.38
Red toners, total-----	27,102	23,164	145,788	6.29
Naphthol reds, total-----	1,452	1,318	12,361	9.38
Pigment Red 2, C.I. 12 310-----	45	50	317	6.38
Pigment Red 5, C.I. 12 490-----	57	53	601	11.32
Pigment Red 17, C.I. 12 390-----	67	20	182	8.95
Pigment Red 22, C.I. 12 315-----	67	63	710	11.32
Pigment Red 23, C.I. 12 355-----	110	101	1,254	12.40
All other naphthol reds-----	1,106	1,031	9,297	9.02
Pigment Red 3, C.I. 12 120-----	1,053	1,026	5,921	5.77
Pigment Red 4, C.I. 12 085-----	143	138	657	4.74
Pigment Red 38, C.I. 21 120-----	146	145	1,569	10.82
Pigment Red 48:1, barium toner, C.I. 15 865-----	601	481	3,158	6.57
Pigment Red 48:2, calcium toner, C.I. 15 865-----	1,600	1,316	8,723	6.63
Pigment Red 48:4, manganese toner, C.I. 15 865-----	302	161	1,205	7.49
Pigment Red 49:1, barium toner, C.I. 15 630-----	5,848	5,247	18,797	3.58
Pigment Red 49:2, calcium toner, C.I. 15 630-----	1,157	839	4,081	4.87
Pigment Red 52:7, calcium toner, C.I. 15 860-----	1,179	1,093	7,063	6.46
Pigment Red 52:2, manganese toner, C.I. 15 860-----	444	409	2,185	5.34
Pigment Red 53:1, barium toner, C.I. 15 585-----	4,305	3,573	17,109	4.79
Pigment Red 57:1, calcium toner, C.I. 15 850-----	5,445	4,550	28,524	6.27
Pigment Red 81, PMA, C.I. 45 160-----	405	390	4,855	12.44
Pigment Red 81, PTA, C.I. 45 160-----	...	46	765	16.62
All other-----	3,022	2,432	28,815	11.85
Violet toners, total-----	2,433	1,881	32,843	17.46
Pigment Violet 1, PMA, C.I. 45 170-----	128	143	1,605	11.21
Pigment Violet 1, PTA, C.I. 45 170-----	61	45	642	14.37

See footnotes at end of table

TABLE 1.--ORGANIC PIGMENTS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

ORGANIC PIGMENTS	PRODUCTION	SALES		
		QUANTITY	VALUE <sup>1</sup>	UNIT VALUE <sup>2</sup>
	1,000 pounds dry basis <sup>3</sup>	1,000 pounds dry basis <sup>3</sup>	1,000 dollars	Per pound
TONERS--Continued				
Violet toners--Continued				
Pigment Violet 3, PMA, C.I. 42 535-----	390	...	...	...
Pigment Violet 3, PTA, C.I. 42 535-----	13	14	212	\$15.35
Pigment Violet 19, C.I. 46 500-----	1,376	935	19,879	21.27
All other-----	465	744	10,505	14.12
Blue toners, total-----	19,632	16,880	104,313	6.18
Pigment Blue 15, alpha form, C.I. 74 160-----	937	776	5,741	7.40
Pigment Blue 15:1, alpha form, C.I. 74 160-----	1,081	795	8,052	10.12
Pigment Blue 15:2, alpha form, C.I. 74 160-----	1,246	690	7,581	10.99
Pigment Blue 15:3, beta form, C.I. 74 160-----	8,454	7,190	45,304	6.30
All other-----	7,914	7,429	37,635	5.07
Green toners, total-----	2,927	2,682	25,655	9.56
Pigment Green 7, C.I. 74 260-----	2,527	2,348	21,801	9.28
Pigment Green 36, C.I. 74 265-----	225	226	2,325	10.30
All other-----	175	108	1,529	14.07
Brown and Black toners-----	196	158	836	5.28
LAKES				
Total-----	815	552	2,759	5.00
Red lakes, total-----	482	340	1,814	5.34
Pigment Red 60:1, C.I. 16 105-----	288	235	1,336	5.68
All other-----	194	105	478	4.57
All other lakes-----	333	212	945	4.46

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

<sup>2</sup>Calculated from unrounded figures, except "All other."

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

Note.--The C.I. (Colour Index) numbers shown in this report are the identifying number given in the third edition of the Colour Index.

The abbreviation PMA and PTA stand for phosphomolybdic and phosphotungstic (including phosphotungstomolybdic) acids, respectively.

TABLE 1A.--U.S. SALES OF SELECTED DRY FULL-STRENGTH TONERS, DRY EXTENDED TONERS, DRY DISPERSIONS, AQUEOUS DISPERSIONS, AND FLUSHED COLORS, 1981

[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 <sup>1</sup>		
	QUANTITY	VALUE	UNIT VALUE <sup>2</sup>
	1,000 pounds	1,000 dollars	Per pound
	dry basis <sup>3</sup>		
Pigment Yellow 12, C.I. 21 090, total-----	8,806	39,181	\$4.45
Dry full-strength toner-----	2,936	12,569	4.28
Flushed color-----	4,200	19,456	4.63
Dry extended toner and aqueous dispersions <sup>4</sup> <sup>5</sup> -----	1,670	7,156	4.29
Pigment Yellow 14, C.I. 21 095, total-----	2,975	14,504	4.88
Dry full-strength toner-----	1,883	9,423	5.00
Aqueous dispersions <sup>4</sup> -----	1,051	4,867	4.63
Dry extended toner, dry dispersions, and flushed color <sup>5</sup> -----	41	214	5.26
Pigment Red 3, C.I. 12 120, total-----	1,026	5,921	5.77
Dry full-strength toner-----	669	3,822	5.72
Aqueous dispersions <sup>4</sup> -----	62	381	6.19
Dry extended toner and flushed color <sup>5</sup> -----	295	1,718	5.82
Pigment Red 48:2, calcium toner, C.I. 15 865, total-----	1,316	8,723	6.63
Dry full-strength toner-----	1,091	7,271	6.66
Aqueous dispersions <sup>4</sup> -----	44	362	8.18
Flushed color-----	104	567	5.43
Dry extended toner and dry dispersions <sup>5</sup> -----	77	523	6.81
Pigment Red 49:1, barium toner, C.I. 15 630, total-----	5,247	18,797	3.58
Flushed color-----	239	934	3.91
Dry full-strength toner, dry extended toner, dry dispersions, and aqueous dispersions <sup>4</sup> <sup>5</sup> -----	5,008	17,863	3.57
Pigment Red 53:1, barium toner, C.I. 15 585, total-----	3,573	17,109	4.79
Aqueous dispersions <sup>4</sup> -----	138	577	4.19
Flushed color-----	2,412	11,698	4.85
Dry full-strength toner and dry dispersions <sup>5</sup> -----	1,023	4,834	4.73
Pigment Red 57:1, calcium toner, C.I. 15 850, total-----	4,550	28,524	6.27
Dry full-strength toner-----	380	2,148	5.65
Flushed color-----	2,984	18,251	6.12
Dry extended toner and aqueous dispersions <sup>4</sup> <sup>5</sup> -----	1,186	8,125	6.85
Pigment Blue 15:1, alpha form, C.I. 74 160, total-----	795	8,052	10.12
Dry full-strength toner-----	597	6,108	10.23
Dry extended toner, dry dispersions, aqueous dispersions and flushed color <sup>4</sup> <sup>5</sup> -----	198	1,944	9.79
Pigment Blue 15:2, alpha form, C.I. 74 160, total-----	690	7,581	10.99
Dry full-strength toner-----	420	4,642	11.03
Aqueous dispersions <sup>4</sup> -----	43	423	9.84
Dry extended toner and flushed color <sup>5</sup> -----	227	2,516	11.12

See footnotes at end of table



TABLE 1A.--U.S. SALES OF SELECTED DRY FULL-STRENGTH TONERS, DRY EXTENDED TONERS, DRY DISPERSIONS, AQUEOUS DISPERSIONS, AND FLUSHED COLORS, 1981--CONTINUED

SELECTED PIGMENTS BY COMMERCIAL FORM	SALES <sup>1</sup>		
	QUANTITY	VALUE	UNIT VALUE <sup>2</sup>
	1,000		
	pounds	1,000	Per
	dry basis <sup>3</sup>	dollars	pound
Pigment Blue 15:3, beta form, C.I. 74 160, total-----	7,190	45,304	\$ 6.30
Aqueous dispersions <sup>4</sup> -----	1,459	8,543	5.86
Flushed color-----	4,813	30,126	6.26
Dry extended toner and dry dispersions <sup>5</sup> -----	918	6,635	7.23
Pigment Green 7, C.I. 74 260, total-----	2,348	21,801	9.28
Dry full-strength toner-----	1,171	11,486	9.81
Aqueous dispersions <sup>4</sup> -----	778	6,463	8.31
Flushed color-----	296	2,628	8.87
Dry extended toner and dry dispersions <sup>5</sup> -----	103	1,224	11.95

<sup>1</sup>Sales quantities and values are identical in tables 1 and 1A.

<sup>2</sup>Calculated from unrounded figures.

<sup>3</sup>Quantity of the various commercial forms is given in terms of dry full-strength toner content.

<sup>4</sup>Includes presscake.

<sup>5</sup>Separate data on these commercial forms may not be published without revealing the operations 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 REPORTED, IDENTIFIED BY MANUFACTURER, 1981

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*). 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)

	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ORGANIC PIGMENTS	
TONERS	
TONERS:	
*YELLOW TONERS:	
ACETOACETARYLIDE YELLOWS:	
*Pigment Yellow 1	: ALE, AMS, BAS, CGY, DUP, HRC, HSH, HST, KCH, KON, SDH,
	: SNA.
*Pigment Yellow 2	: KCM.
*Pigment Yellow 3	: ALE, BAS, BNS, CGY, DUP, GLX, HRC, HSH, HST, KCH, KON,
	: SNA.
Pigment Yellow 5	: CGY.
Pigment Yellow 6	: CGY.
Pigment Yellow 49	: ROM.
Pigment Yellow 60	: HSH.
*Pigment Yellow 65	: CGY, DUP, HRC, HSH, SNA.
*Pigment Yellow 73	: CGY, HRC, HSH, HST, SNA.
*Pigment Yellow 74	: BAS, CGY, DUP, HRC, HSH, HST, SDH, SNA, VPC.
Pigment Yellow 75	: CGY.
Pigment Yellow 97	: HST.
Pigment Yellow 98	: HST.
Acetoacetarylide yellows, all others	: KCM.
DIARYLIDE YELLOWS:	
*Pigment Yellow 12	: AMS, APO, BAS, BOR, CGY, GLX, HRC, HSH, HST, ICC, IDC,
	: IND, POP, ROM, SDH, SNA.
*Pigment Yellow 13	: AMS, APO, BAS, CGY, GLX, HRC, HST, IDC, IND, ROM, SDH,
	: SNA.
*Pigment Yellow 14	: AMS, BAS, BNS, CGY, GLX, HRC, HSH, HST, ICC, IND,
	: ROM, SDH, SNA.
*Pigment Yellow 17	: AMS, APO, BAS, CGY, GLX, HRC, HSH, HST, ICC, IND,
	: ROM, SDH, SNA.
Pigment Yellow 55	: CGY, GLX.
*Pigment Yellow 83	: BAS, GLX, HST, ICC, IND, SNA.
Pigment Yellow 124	: GLX.
Pigment Yellow 126	: HST.
Pigment Yellow 127	: HST.
Pigment Yellow 152	: HST.
Diarylide yellows, other	: GLX, HSH, ROM.
*YELLOW PIGMENTS, OTHER:	
(Basic Yellow 2), fugitive	: MRX.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981  
--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TONERS--CONTINUED	
*YELLOW TONERS--CONTINUED	
*YELLOW PIGMENTS, OTHER--CONTINUED	
Pigment Yellow 16	HST.
Pigment Yellow 62	CGY.
Pigment Yellow 110	CGY.
Pigment Yellow 139	HRC.
Pigment Yellow 150	HRC.
*Pigment yellow toners, all other	CGY.
*ORANGE TONERS:	
Pigment Orange 1	HRC, KCM.
Pigment Orange 2	CGY, UHL.
*Pigment Orange 5	ACY, ALE, BAS, CGY, HRC, HSH, HST, SDH, SNA.
*Pigment Orange 13	AMS, BAS, CGY, HRC, HSH, ICC, IND, SNA.
Pigment Orange 15	BNS, HRC.
*Pigment Orange 16	BNS, CGY, GLX, HRC, HSH, IND, ROM, SDH, USM.
*Pigment Orange 34	CGY, GLX, HRC, IND, ROM, SDH.
Pigment Orange 43	CGY, HST.
Pigment Orange 46	BAS.
Pigment Orange 48	DUP.
Pigment Orange 49	DUP.
*Pigment orange toners, all other	CGY, GLX, ROM.
*RED TONERS:	
*NAPHTHOL REDS:	
*Pigment Red 2	CGY, GLX, HRC, HSH, KCM.
*Pigment Red 5	CGY, GLX, HSH, ROM.
Pigment Red 7	GLX, HST.
Pigment Red 9	CGY, HST, MRX.
Pigment Red 12	IND.
Pigment Red 13	CGY, KCM.
*Pigment Red 17	ACY, BNS, CGY, ROM, SNA, UHL.
*Pigment Red 21	BNS.
*Pigment Red 22	ACY, CGY, DUP, ROM, SNA.
*Pigment Red 23	ACY, CGY, DUP, GLX, HSH, IND, KCM, ROM, SDH, UHL.
*Pigment Red 31	ROM, SDH.
Pigment Red 32	IND.
Pigment Red 112	CGY, HST.
Pigment Red 119	HRC.
Pigment Red 146	IND.
Pigment Red 147	HSH.
Pigment Red 170	GLX, HST.
*Naphthol reds, all other	BUC, DUP, GLX, HSH, HST, ICC, IND, KCM, ROM, SDH, SNA.
*RED PIGMENTS, OTHER:	
Pigment Red 1, (dark)	CGY, HSH, KCM.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981  
--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TONERS--CONTINUED	
*RED TONERS--CONTINUED	
*RED PIGMENTS, OTHER--CONTINUED	
*Pigment Red 1, (light)	CGY, HSH.
*Pigment Red 3	ACY, ALE, BAS, CGY, CIK, DUP, HSH, KCM, KON, MRX, SDH, SNA, UHL.
*Pigment Red 4	ALE, AMS, BAS, CGY, HSH, KCH, KON, MRX, SDH, UHL.
*Pigment Red 6	DUP, HSH, KCM, KON.
*Pigment Red 38	GLX, HRC, HSH, HST, SNA.
*Pigment Red 41	HRC.
*Pigment Red 48	CGY, DUP.
*Pigment Red 48-1, (barium)	ACY, ALE, AMS, BAS, BOR, DUP, HSH, MGR, SNA, UHL.
*Pigment Red 48-2, (calcium)	ACY, ALE, AMS, APO, BAS, DUP, HRC, HSH, MGR, MRX, SDH, SNA, UHL.
Pigment Red 48-3, (strontium)	CGY, HSH.
*Pigment Red 48-4, (manganese)	ACY, CGY, DUP, HRC, HSH.
Pigment Red 49, (sodium)	BNS, SDH.
*Pigment Red 49-1, (barium)	ACY, ALE, AMS, BAS, BNS, BOR, CIK, HRC, ICC, IDC, MRX, SDH, SNA, UHL.
*Pigment Red 49-2, (calcium)	ACY, ALE, AMS, BNS, BOR, CIK, HRC, IDC, SDH.
*Pigment Red 52-1, (calcium)	ACY, BAS, CGY, MGR, MRX, SNA, UHL.
*Pigment Red 52-2, (manganese)	ACY, BAS, CGY, HSH, UHL.
*Pigment Red 53-1, (barium)	ACY, ALE, AMS, APO, BAS, BOR, CIK, HSH, ICC, IDC, KON, MGR, MRX, SDH, SNA, UHL.
Pigment Red 57	BNS.
*Pigment Red 57-1, (calcium)	ACY, ALE, AMS, APO, BAS, BNS, BOR, CGY, CIK, DUP, HSH, ICC, IDC, KON, MGR, SDH, SNA, UHL.
Pigment Red 63	HSH, KON, SNA.
*Pigment Red 81, (PMA)	CGY, DUP, KON, LVE, MGR, MRX, SNA, UHL.
*Pigment Red 81, (PTA)	CGY, KON, MGR, MRX, UHL.
Pigment Red 88	HRC.
Pigment Red 90	BOR, SDH.
Pigment Red 122	HRC, SHA.
Pigment Red 123	RAS, HRC.
Pigment Red 149	HRC, HST.
Pigment Red 166	CGY.
Pigment Red 168	HRC.
Pigment Red 179	HRC.
Pigment Red 181	HST.
Pigment Red 190	HRC.
Pigment Red 202	DUP, HRC.
Pigment Red 206	DUP.
Pigment Red 207	DUP.
Pigment Red 224	HRC.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

--CONTINUED	
ORGANIC PIGMENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*RED TONERS--CONTINUED	
*RED PIGMENTS, OTHER--CONTINUED	
*Pigment red toners, all other--	: ACY, BAS, CGY, DUP, HST.
*VIOLET TONERS:	
*Pigment Violet 1, (fugitive) --	: KCM, UHL.
*Pigment Violet 1, (PMA) --	: CGY, MGR, MRX, UHL.
*Pigment Violet 1, (PTA) --	: CGY, MGR, MRX, SNA, UHL.
*Pigment Violet 3, (fugitive) --	: BAS, KCM, MGR, UHL.
*Pigment Violet 3, (PMA) --	: BAS, DUP, KON, MGR, MRX, SDH, UHL.
*Pigment Violet 3, (PTA) --	: BAS, MGR, MRX, UHL.
*Pigment Violet 4, (fugitive) --	: KCM.
*Pigment Violet 19 --	: DUP, HRC, SNA.
*Pigment Violet 23 --	: BAS, HRC, HST, ROM, SNA.
*Pigment Violet 29 --	: HRC.
*Pigment Violet 31 --	: HRC, VFC.
*Pigment Violet 42 --	: DUP.
*Pigment violet toners, all other --	: BUC, ROM, X.
*BLUE TONERS:	
(Basic Blue 7) --	: KCM.
*Pigment Blue 1, (PMA) --	: BMS, CGY, MGR, MRX, SDH, UHL.
*Pigment Blue 2, (PMA) --	: LVR, UHL.
*Pigment Blue 9, (PMA) --	: LVR.
*Pigment Blue 10, (PMA) --	: SDH.
*Pigment Blue 14, (PMA) --	: DUP, LVR, UHL.
*Pigment Blue 15, (α form) --	: ACY, BAS, CGY, DUP, HSH, SDH, TMS, USM.
*Pigment Blue 15, (β form) --	: ACY, BAS, CGY, DUP, HRC, HST, SDH, SNA, TMS, VFC.
*Pigment Blue 15:1, (α form) --	: ACY, BAS, CGY, DUP, HRC, SDH, SNA, TMS.
*Pigment Blue 15:2, (α form) --	: ACY, AMS, APO, BAS, BOR, BUC, CGY, CIK, CUS, DUP, HRC,
*Pigment Blue 15:3, (β form) --	: ICC, IDC, IPP, MGR, POP, ROM, SDH, SNA.
*Pigment Blue 15:4, (β form) --	: ACY, BAS, CGY, DUP, SNA.
*Pigment Blue 19 --	: SM.
*Pigment Blue 25 --	: GLX.
*Pigment Blue 61 --	: BAS.
*Pigment blue toners, all other --	: CGY, UHL.
*GREEN TONERS:	
*Pigment Green 1, (PMA) --	: LVR, MRX, UHL.
*Pigment Green 2, (PMA) --	: MRX, UHL.
*Pigment Green 2, (PTA) --	: ACY, KON, UHL.
*Pigment Green 4, (PTA) --	: ACY.
*Pigment Green 7 --	: ALG, BAS, CGY, CIK, DUP, HRC, HST, POP, SDH, SNA, TMS.
*Pigment Green 8 --	: CGY, KCM.
*Pigment Green 10 --	: CGY, DUP.
*Pigment Green 36 --	: DUP, HRC, HST, SNA, VFC.

TABLE 2.--ORGANIC PIGMENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981  
--CONTINUED

ORGANIC PIGMENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TONERS--CONTINUED	
*GREEN TONERS--CONTINUED	
*Pigment green toners, all other-	CGY, UHL, X.
BROWN TONERS:	
Pigment Brown 1-	GLX.
Pigment Brown 3, (PMA)	KON.
Pigment Brown 5-	GLX, HRC, ICC, ROM.
Pigment brown toners, all other-	SDH.
BLACK TONERS:	
Pigment black toners, all other-	UHL.
*LAKES:	
YELLOW LAKES:	
(Acid Yellow 23)	KON, MRX.
ORANGE LAKES:	
Pigment Orange 17-	KCM.
*RED LAKES:	
(Acid Red 26)-	KCM.
(Basic Red 1)-	BMS.
*Pigment Red 60:1	HSN, KON, MRX, SDH, SMA.
Pigment Red 83	CGY, HSH, MRX, UHL.
VIOLET LAKES:	
(Basic Violet 1)	BMS.
(Basic Violet 4)	BMS.
(Basic Violet 10)-	BMS.
Pigment Violet 5:1	CGY, HRC, HSH, KON, MRX, UHL.
BLUE LAKES:	
Pigment Blue 24-	SDH.
Pigment blue lakes, all other-	KON.
BROWN LAKES:	
Pigment brown lakes, all other	KON.

TABLE 3.--ORGANIC PIGMENTS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of organic pigments to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ACY	: American Cysnamid Co.	KCW	: Keystone Color Works, Inc.
ALE	: Alex Chemical Co.	KON	: H. Kohnstamm & Co., Inc.
ALG	: Allegheny Chemical Corp.		
AMS	: Ridgway Color Co.	LVR	: C. Lever Co., Inc.
APO	: Apollo Colors, Inc.		
		MGR	: Magruder Color Co., Inc.
BAS	: BASF Wyandotte Corp., Pigments Div.	MRX	: Max Marx Color & Chemical Co.
BNS	: Binney and Smith, Inc.		
BOR	: Borden, Inc., Printing Ink Div., Pigments Div.	POP	: Pope Chemical Corp.
BUC	: Synalloy Corp., Blackman Uhler Chemical Div.		
		ROM	: Roma Chemical, Inc.
CGY	: Ciba-Geigy Corp.		
CIK	: Flint Ink Corp., Cal/Ink Div.	SDH	: Sterling Drug, Inc., Hilton Davis Chemical Co.
CUS	: Customs Pigments Corp.		: Div.
		SNA	: Sun Chemical Corp.
DUP	: E. I. duPont de Nemours & Co., Inc.	SW	: Sherwin-Williams Co.
GLX	: Galaxie Chemical Corp.	TMS	: Sterling Drug, Inc., Thomasset Colors Div.
HRC	: Mobay Chemical Corp., Dyes & Pigments Div., : Pigments Dept.	UHL	: Paul Uhlich & Co., Inc.
HSB	: Harshaw Chemical Co.	USM	: Crown Metro, Inc.
HST	: American Hoechst Corp., Industrial Chemicals : Div.	VPC	: Mobay Chemical Corp., Dyestuff Div.
ICC	: Immont Corp. Div. of United Technology Corp.		
IDC	: Industrial Color, Inc.		
IND	: Indol Color Co., Inc.		
IPP	: International Pigment & Processing Corp.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 36 reporting companies and company divisions for which permission to publish was not restricted.



## STATISTICAL HIGHLIGHTS

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 tables 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.<sup>1</sup> The difference between production and sales reflects inventory changes, processing losses, and captive consumption of medicinal chemicals processed into ethical and proprietary pharmaceutical products by the primary manufacturer. In some instances, the difference may also include quantities for medicinal grade products used as intermediates, for example, penicillin G salts used as intermediates in the manufacture of semisynthetic 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 1981 amounted to 244.7 million pounds. Total sales of bulk medicinal chemicals in 1981 amounted to 153.4 million pounds, valued at \$1,198.7 million. Beginning in 1980, methionine and other amino acids and their salts are reported in the section on Miscellaneous End-Use Chemicals and Chemical Products. Section totals are not, therefore, comparable with those of previous years.

Production of the larger groups of medicinal chemicals in 1981 was as follows: Antibiotics, 30.6 million pounds, 24.3 percent more than in 1980; anti-infective agents other than antibiotics 31.8 million pounds, 9.5 percent more than in 1980; central nervous system depressants and stimulants, 58.2 million pounds, 3.0 percent less than in 1980; and vitamins, 43.1 million pounds, 1.3 percent more.

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

Production of some of the more important individual products listed in the table was as follows: Choline chloride, 58.9 million pounds, 7.2 percent less than in 1980; aspirin, 29.7 million pounds, 12.1 percent less; acetaminophen, 20.2 million pounds, 17.0 percent more; penicillins (except semi-synthetic), 7.4 million pounds, 13.0 percent more; vitamin E, 10.2 million pounds, 40.4 percent more; and tetracyclines, 6.8 million pounds, 4.3 percent more.

TABLE 1.--MEDICINAL CHEMICALS: U.S. PRODUCTION AND SALES, 1981

[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 manufacturer of each]

MEDICINAL CHEMICALS	SALES			
	PRODUCTION <sup>1</sup>	QUANTITY	VALUE	UNIT VALUE <sup>2</sup>
Grand total-----	244,682	153,430	1,198,692	\$7.81
Acyclic-----	64,422	53,226	54,292	1.02
Benzenoid <sup>3</sup> -----	125,285	76,242	705,226	9.25
Cyclic nonbenzenoid <sup>4</sup> -----	54,975	23,962	439,174	18.33
Antibiotics, total-----	30,605	9,729	412,878	42.44
Cephalosporins-----	1,106	...	...	...
Penicillins, semisynthetic, total-----	2,261	415	27,799	66.99
Amoxicillin-----	542	...	...	...
Ampicillin-----	1,210	...	...	...
All other (semisynthetic) <sup>5</sup> -----	509	415	27,799	66.99
Penicillins (except semisynthetic), total-----	7,362	1,569	21,652	13.80
Penicillin G, Potassium, for medicinal use-----	3,038	...	...	...
All other for all uses <sup>6</sup> -----	4,324	1,569	21,652	13.80
Tetracyclines, for all uses-----	6,846	4,101	92,071	22.45
Other antibiotics, total-----	13,030	3,644	271,356	74.47
For medicinal use <sup>7</sup> -----	4,284	2,084	241,837	116.04
For nonmedicinal uses-----	8,746	1,560	29,519	18.92
Antihistamines, total-----	356	181	8,237	45.51
Antinauseants-----	49	28	1,095	39.11
Brompheniramine maleate-----	25	28	1,579	56.39
All other-----	282	125	5,563	44.50
Anti-infective agents (except antibiotics), total-----	31,779	9,470	51,133	5.40
Anthelmintics, total-----	13,460	3,176	5,325	1.68
Piperazine dihydrochloride-----	731	715	1,101	1.54
All other-----	12,729	2,461	4,224	1.72
Antiprotozoan agents, total-----	9,831	2,024	13,117	6.48
Arsenic and bismuth compounds-----	...	1,877	9,793	5.22
All other <sup>8</sup> -----	9,831	147	3,324	22.61
Sulfonamides, total <sup>9</sup> -----	3,885	736	9,970	13.55
Sulfamethazine-----	986	...	...	...
All other <sup>10</sup> -----	2,899	736	9,970	13.55
Urinary antiseptics-----	223	...	...	...
Other anti-infective agents <sup>11</sup> -----	4,380	3,534	22,721	6.43
Autonomic drugs, total-----	1,109	706	15,101	21.39
Sympathomimetic (adrenergic) agents, total-----	1,036	696	13,959	20.06
Phenylpropanolamine hydrochloride-----	566	353	3,418	9.68
All other-----	470	343	10,541	30.73
Other autonomic drugs-----	73	10	1,142	114.20
Central depressants and stimulants, total-----	58,180	48,149	216,480	4.50
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents, total-----	51,143	44,111	113,013	2.56
Acetaminophen-----	20,173	...	...	...
Aspirin-----	29,656	...	...	...
All other <sup>12</sup> -----	1,314	44,111	113,013	2.56
Anticonvulsants, hypnotics, and sedatives-----	1,307	338	5,610	16.60
Antidepressants-----	142	21	2,054	97.81
Antitussives, total-----	350	330	72,575	219.92
Codeine-----	139	136	50,745	373.13
All other-----	211	194	21,830	112.53

See footnotes at end of table.

TABLE 1.--MEDICINAL CHEMICALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

MEDICINAL CHEMICALS	SALES			
	PRODUCTION <sup>1</sup>	QUANTITY	VALUE	UNIT VALUE <sup>2</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Central depressants and stimulants--Continued				
Tranquilizers, total-----	380	...	...	...
Phenothiazine derivatives-----	61	...	...	...
All other-----	319	...	...	...
Other central depressants and stimulants <sup>13</sup> -----	4,858	3,349	23,228	\$6.93
Dermatological agents-----	5,305	5,259	6,044	1.15
Expectorants and mucolytic agents-----	1,570	1,305	8,965	6.88
Gastrointestinal agents and therapeutic nutrients, total <sup>14</sup> -----	62,497	50,626	39,270	.78
Choline chloride, all grades-----	58,946	48,515	29,368	.61
All other-----	3,551	2,111	9,902	4.69
Hematological agents-----	98	...	...	...
Hormones and synthetic substitutes, total-----	915	149	121,217	813.54
Synthetic hypoglycemic agents-----	737	...	...	...
All other <sup>15</sup> -----	178	149	121,217	813.54
Local anesthetics-----	80	49	1,326	27.06
Renal-acting and edema-reducing agents-----	1,337	187	7,541	40.33
Smooth muscle relaxants <sup>16</sup> -----	261	...	...	...
Vitamins, total-----	43,125	26,262	256,032	9.75
Vitamin E-----	10,188	5,480	93,465	17.06
All other vitamins <sup>17</sup> -----	32,937	20,782	162,567	7.82
Miscellaneous medicinal chemicals <sup>18</sup> -----	7,465	1,358	54,468	40.11

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

<sup>2</sup>Calculated from rounded figures.

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

<sup>4</sup>Includes antibiotics of unknown structure.

<sup>5</sup>Includes sales quantity and value of amoxicillin and ampicillin.

<sup>6</sup>Includes sales quantity and value of penicillin G, potassium.

<sup>7</sup>Includes production and sales of antifungal and antitubercular antibiotics; and sales quantity and value of cephalosporins.

<sup>8</sup>Includes production of arsenic and bismuth compounds.

<sup>9</sup>Does not include production of sulfaguanidine used as an intermediate in the production of anti-infective sulfonamides.

<sup>10</sup>Includes sales quantity and value of sulfamethazine.

<sup>11</sup>Includes sales quantity and value of urinary antiseptics.

<sup>12</sup>Includes sales quantity and value of acetaminophen and aspirin.

<sup>13</sup>Includes sales quantity and value of tranquilizers. Also includes production and sales of amphetamines, general anesthetics, respiratory and cerebral stimulants, and skeletal muscle relaxants.

<sup>14</sup>Methionine and its salts are now reported in the section on Miscellaneous End-Use Chemicals and Chemical Products under amino acids.

<sup>15</sup>Includes sales quantity and value of synthetic hypoglycemic agents.

<sup>16</sup>Includes theophylline derivatives.

<sup>17</sup>Includes production and sales of vitamin A, vitamin B, vitamin C, vitamin D, and vitamin K.

<sup>18</sup>Includes production and sales of antineoplastic agents, cardiovascular agents, diagnostic agents, and unclassified medicinal chemicals. Also, includes sales quantity and value of hematological agents and smooth muscle relaxants.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1991

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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]

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*ANTIBIOTICS:	
*CEPHALOSPORINS:	
Cefaclor	LIL.
Cefazolin, sodium	LIL, SK.
Cefoxitin	MRK.
Cephalexin	LIL.
Cephaloridine	LIL.
Cephalothin, sodium	LIL.
Cephapirin	BRS.
Cephaparin, sodium	BRS.
Cephazone	SK, TRD.
*PENICILLINS, SEMISYNTHETIC:	
*AMOXICILLIN:	
Amoxicillin (trihydrate)	BEE, ROC, BRS.
Amoxicillin (anhydrous)	BRS, WYT.
*AMPICILLIN:	
Ampicillin (anhydrous)	BRS, WYT.
Ampicillin (trihydrate)	BEE, SOC, BRS, TRD.
*OTHER SEMISYNTHETIC PENICILLINS:	
Ampicillin, sodium	BEE, BRS, WYT.
Carbenicillin, disodium	BEE, PFZ.
Carbenicillin indanyl, sodium	BEE, SOC, BRS.
Cloxacillin, sodium	WYT.
Cyclacillin	BEE, BRS, WYT.
Dicloxacillin, sodium	TRD.
Epicillin	BRS.
Hetacillin	BEE, BRS.
Hetacillin, potassium	BRS, WYT.
Methicillin, sodium	BEE, BRS.
Nafcillin, sodium	BEE, SOC, BRS.
Oxacillin, sodium	BEE.
Ticarcillin, disodium	
*PENICILLINS (EXCEPT SEMISYNTHETIC):	
FOR MEDICINAL USE:	
Penicillin V	BRS, LIL, PFZ.
Penicillin G, benzathine	BRS, WYT.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER,  
1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*ANTIBIOTICS--CONTINUED	
*PENICILLINS (EXCEPT SEMISYNTHETIC)--CONTINUED	
FOR MEDICINAL USE--CONTINUED	
Penicillin G, potassium	LLI, OMS, PFZ, WYT.
Penicillin V, potassium	BRS, LIL
Penicillin G, procaine (medicinal grade)	PFZ, WYT.
FOR NONMEDICINAL USES:	
Penicillin G, procaine (animal feed grade)	MRK, OMS, PFZ.
*TETRACYCLINES:	
FOR MEDICINAL USE:	
Chlortetracycline (medicinal grade)	ACY.
Demeclocycline	ACY.
Doxycycline	PFZ.
Methacycline	PFZ.
Minocycline	ACI.
Oxytetracycline (medicinal grade)	PFZ.
Tetracycline	ACI.
FOR NONMEDICINAL USES:	
Chlortetracycline (animal feed grade)	ACY, RLS.
Oxytetracycline (animal feed grade)	PFZ.
*OTHER ANTIBIOTICS:	
*FOR MEDICINAL USE:	
ANTIFUNGAL ANTIBIOTICS:	
Amphotericin B	OMS, TRD.
Candidin	PEN.
Nystatin (medicinal grade)	ACY, OMS, TRD.
ANTITUBERCULAR ANTIBIOTICS:	
Dihydrostreptomycin	PFZ.
Streptomycin (medicinal grade)	PFZ.
OTHER ANTIBIOTICS FOR MEDICINAL USE:	
Bactracin (medicinal grade)	IMC.
Chloramphenicol	PD, RLS.
Chloramphenicol palmitate	PD.
Clindamycin	UPJ.
Erythromycin	ABB, LIL, UPJ.
Erythromycin estolate	LIL.
Erythromycin stearate	UPJ.
Gentamycin	SCH.
Kanamycin	BRS.
Lincomycin (medicinal grade)	UPJ.
Moxalactam	LIL.
Neomycin (medicinal grade)	PFZ, UPJ.
Novobiocin, sodium	MRK, UPJ.
Polymyxin B	PFZ.



TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*ANTIBIOTICS--CONTINUED	
*OTHER ANTIBIOTICS--CONTINUED	
*FOR MEDICINAL USE--CONTINUED	
OTHER ANTIBIOTICS FOR MEDICINAL USE--CONTINUED	
Spectinomycin (medicinal grade) --	ABB, UPJ.
Thiostrepton --	OMS.
Vancomycin --	LIL.
*FOR NONMEDICINAL USES:	
Bacitracin (animal feed grade) --	IMC.
Cycloheximide --	UPJ.
Hygromycin B --	LIL.
Lasalocid --	HOF.
Lincosycin (animal feed grade) --	UPJ.
Nonoxin --	LIL.
Neomycin (animal feed grade) --	PFZ, UPJ.
Neovibocin (animal feed grade) --	UPJ.
Nystatin (animal feed grade) --	OMS.
Streptomycin --	PFZ.
Tylosin --	LIL.
*ANTIHISTAMINES:	
*ANTINAUSEANTS:	
Cyclizine hydrochloride --	BUR.
Dimenhydrinate --	GAN, SRL.
Mecizine hydrochloride --	PFZ.
Metoclopramide hydrochloride --	LIL, X.
Trimethobenzamide hydrochloride --	GAN, HOF.
*OTHER ANTIHISTAMINES:	
Azatadine maleate --	SCH.
Bromodiphenhydramine hydrochloride --	PD.
*Brompheniramine maleate --	HEX, LLI, SCH.
Carbinoxamine maleate --	SCH.
Chlorcyclizine hydrochloride --	BUR.
Chlorpheniramine maleate --	HEX, SCH, SK.
Cyproheptadine hydrochloride --	GAN, MRK.
Dechlorpheniramine maleate --	SCH.
Dechlorpheniramine maleate --	SCH.
Dimethindene maleate --	CGY.
Diphenhydramine hydrochloride --	PD.
Doxylamine succinate --	BUL, BKC, HOF.
Methdilazine --	BUL.
Phenidamine tartrate --	HOF.
Phenyltoloxamine citrate --	GAN, PD.
Pyrilamine maleate --	HEX.
Tripelemamine --	CGY.
Tripelemamine citrate --	CGY.



TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*ANTIHISTAMINES--CONTINUED	
*OTHER ANTIHISTAMINES--CONTINUED	
Triethanamine hydrochloride	: CGY.
Triethylamine hydrochloride	: AMD, BUR.
*ANTI-INFEKTIVE AGENTS (EXCEPT ANTIBIOTICS):	
*ANTHELMINTICS:	
Dichlorvos	: SHC.
Phenothiazine	: WAG.
Piperazine	: DOM, TX, UCC.
Piperazine citrate	: PCL.
*Piperazine dihydrochloride	: FLM, PCL, TX, WHL.
Piperazine hexahydrate	: PCL, TX.
Piperazine hydrochloride	: FLM, TX.
Piperazine phosphate	: PCL, TX.
Piperazine sulfate	: TX.
Pyranterol pamoate	: PFZ.
Pyranterol tartrate	: PFZ.
Rafoxanide	: MRK.
Thiabendazole	: MRK.
*ANTIPROTOZOAN AGENTS:	
*ARSENIC AND BISMUTH COMPOUNDS:	
Arsenic acid	: FLM, WHL.
Bismuth subsalicylate	: NOR.
Carbarzone	: WHL.
Glycobiarsol	: PCL.
Nitarzone	: SAL.
Roxarsone	: SAL.
Roxarsone, sodium	: SAL.
*OTHER ANTIPROTOZOAN AGENTS:	
Atleamide	: SAL.
Amodiaquine hydrochloride	: PD.
Apryllium	: MRK.
Atrinecid	: MRK.
Dinitolamide	: SAL.
Ethopate	: MRK.
Furazolidone	: NOR.
Hydroxychloroquine sulfate	: SDW.
Iodochlorhydroxyquin	: CGI.
Ipronidazole	: HOF.
Metronidazole	: RDA.
Nitromide	: SAL.
Ronidazole	: MRK.

TABLE 2. --MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*ANTI-INFECTIVE AGENTS (EXCEPT ANTIBIOTICS)--CONTINUED	
*SULFONAMIDES:	
Acetyl sulfisoxazole	ABB, HOF.
Mafenide	SDM.
Mafenide acetate	SDM.
Sulfabenzamide	ACY.
Sulfacetamide, sodium	SCH.
Sulfachloropyridazine, sodium	ACY.
Sulfachloropyridazine	ACY.
Sulfadiazine	ACY.
Sulfadimethoxine	HOF.
*Sulfamethazine	ACY, RLS, SAL.
Sulfamethazine, sodium	SAL.
Sulfamethizole	ACY.
Sulfamethoxazole	HOF.
Sulfanitran	SAL.
Sulfaguanoxaline	MRK.
Sulfasalazine	SAL.
Sulfathiazole, sodium	SAL.
Sulfisoxazole	HOF.
*URINARY ANTISEPTICS:	
Methenamine hippurate	LKL, RIK.
Methenamine mandelate	ARM, PD.
Nitrofurantoin	NOR.
*OTHER ANTI-INFECTIVE AGENTS:	
ANTIFUNGAL AGENTS:	
Benzoic acid	MOK.
Calcium undecylenate	WTL.
Sodium caprylate	LEH.
Zinc undecylenate	WTL.
ANTILEPTIC AND ANTITUBERCULAR AGENTS:	
Aminosalicylic acid	HXL.
Sulfoxone, sodium	ABB.
ANTIVIRAL AGENTS:	
vidarabine	PD.
MERCURY COMPOUNDS:	
Merbromin	HYN.
Nitroresorcinol	ABB.
GENERAL ANTISEPTICS AND ANTIBACTERIAL AGENTS:	
Carbadox	PFZ.
Cetalkonium chloride	HXL.
Cetylpyridinium chloride	HEX, HXL, LKL.
Chlorobutanol	SFS.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*ANTI-INFECTION AGENTS (EXCEPT ANTIBIOTICS)--CONTINUED	
*OTHER ANTI-INFECTION AGENTS--CONTINUED	
GENERAL ANTISEPTICS AND ANTIBACTERIAL AGENTS--CONTINUED	
Chlorothymol - - - - -	OPC.
m-Cresyl acetate - - - - -	ADC.
9-Hydroxy-9-quinolinesulfonic acid	MRK.
Iodoform - - - - -	DPM, PEN.
Nalidixic acid - - - - -	X.
Ormetoprim - - - - -	HOF.
Povidone - iodine - - - - -	GAF.
Resorcinol - - - - -	LEN.
Thymol - - - - -	KPT.
Trimethoprim - - - - -	BUR, HOF.
*AUTONOMIC DRUGS:	
*SYMPATHOMIMETIC AGENTS:	
Dobutamine hydrochloride - - - - -	LIL.
Dopamine hydrochloride - - - - -	HEX.
Isoetharine hydrochloride - - - - -	SDM.
Isoproterenol hydrochloride - - - - -	SDM.
Isoproterenol sulfate - - - - -	ABB.
Mephentermine - - - - -	ARA.
Mephentermine sulfate - - - - -	ARA.
Methoxyphenamine hydrochloride	HXL
Naphazoline hydrochloride - - - - -	CGY.
Phenylephrine - - - - -	SDM.
Phenylephrine bitartrate - - - - -	GAN.
Phenylephrine hydrochloride - - - - -	GAN, SDM.
Phenylpropanolamine hydrochloride	ARS, GAN, NEP, ORT, X.
Propylhexedrine - - - - -	PD, SK.
Pseudoephedrine hydrochloride - - - - -	BUR, GAN.
Pseudoephedrine sulfate - - - - -	GAN.
Terbutaline sulfate - - - - -	CGY.
*OTHER AUTONOMIC DRUGS:	
PARASYMPATHOLYTIC QUATERNARY AMMONIUM COMPOUNDS (EXCEPT TROPANE DERIVATIVES):	
Diphenamil methylsulfate - - - - -	SCH.
Glycopyrrolate - - - - -	X.
Hexocyclium methylsulfate - - - - -	ABB.
Isopropamide iodide - - - - -	SK.
Mepenzolate bromide - - - - -	LKL.
Pipenzolate bromide - - - - -	LKL.
Propantheline bromide - - - - -	SRL.
Tridihexethyl chloride - - - - -	ACY.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*AUTOMATIC DRUGS--CONTINUED	
*OTHER AUTOMATIC DRUGS--CONTINUED	
PARASYMPATHOLYTIC TERTIARY AMINES	
(EXCEPT TROPANE DERIVATIVES):	
Dicyclanil hydrochloride	BKC.
Oxybutynin chloride	PD.
Oxyphenyclamine hydrochloride	PFZ.
Trihexphenidyl hydrochloride	ACY.
PARASYMPATHOLYTIC TROPANE DERIVATIVES:	
Anisotropine methylbromide	ARA.
Benztropine mesylate	ARA.
PARASYMPATHOMIMETIC AGENTS:	
Bethanechol chloride	GAN.
Neostigmine bromide	HOF.
Neostigmine methylsulfate	HOF.
Pyridostigmine bromide	HOF.
SYMPATHOLYTIC AGENTS:	
Timolol maleate	MRK.
*CENTRAL DEPRESSANTS AND STIMULANTS:	
*ANALGESICS, ANTIPIRETTICS, AND NONHORMONAL ANTI- INFLAMMATORY AGENTS:	
*Acetanaphen	MAL, MON, PEN.
*Aminobenzoic acid	GAN, MAL.
*Aspirin	DOM, MON, NOR, SDM.
Aurothioglucose	SCM.
Benzocaprofen	LIL.
Choline magnesium salicylate	LEM.
Diflunisal	MRK.
Ethohptazine citrate	WYT.
Fenoprofen	LIL.
Indomethacin	MRK.
Indoprofen	PD.
Meclofenamate, sodium	PD.
Meclofenamic acid	PD.
Mefenamic acid	PD.
Mepredine hydrochloride	PEN, SDM, WYT.
Methadone hydrochloride	MAL, PEN.
Morphine sulfate (pentahydrate)	MRK, PEN.
Morphine sulfate	MAL.
Oxycodone hydrochloride	EN, MAL, PEN.
Oxyphenbutazone	CCY.
Phenylbutazone	DOU.
Phenyl salicylate	DOU.
Potassium aminobenzoate	GAN.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*CENTRAL DEPRESSANTS AND STIMULANTS--CONTINUED	
*ANALGESICS, ANTIPIRETICS, AND NONHORMONAL ANTI-INFLAMMATORY AGENTS--CONTINUED	
Potassium salicylate	HN.
Propoxyphene hydrochloride	GAN, ILL.
Propoxyphene napsylate	GAN, ILL.
Salicylamide	PEN.
Salsalate	PD, RIK.
Sodium aminobenzoate	GAN.
Sodium salicylate	HN.
Sulindac	MRK.
Zomepirac, sodium	SDM.
*ANTICONSULSANTS, HYPNOTICS, AND SEDATIVES:	
ANTICONSULSANTS (EXCEPT BARBITURATES):	
Aminoglutethimide	CGY.
Carbamazepine	CGY.
Ethosuximide	PD.
Ethotoin	ABB.
Methsuximide	PD.
Phenacemide	ABB.
Phensuximide	PD.
Phenytoin	PD.
Phenytoin, sodium	PD.
Valproic acid	ABB, ARA.
BARBITURATES:	
Anobarbital	GAN.
Anobarbital, sodium	GAN.
Butabarbital	ABB, GAN.
Butabarbital, sodium	ABB, GAN.
Butalbital	GAN.
Butalbital, sodium	GAN.
Mephobarbital	SDM.
Methohexital, sodium	ILL.
Pentobarbital	ABB, GAN.
Pentobarbital, sodium	ABB, GAN.
Phenobarbital	GAN.
Phenobarbital, sodium	GAN.
Secobarbital, sodium	GAN.
Talbutal	GAN.
Thiopental, sodium	ABB.
HYPNOTICS AND SEDATIVES (EXCEPT BARBITURATES):	
Carbromal	PD.
Ethchlorvynol	ABB.
Glutethimide	CGY, GAN.

TABLE 2. --MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*CENTRAL DEPRESSANTS AND STIMULANTS--CONTINUED	
*ANTICONSULSANTS, HYPNOTICS, AND SEDATIVES--CONTINUED	
HYPNOTICS AND SEDATIVES	
(EXCEPT BARBITURATES)--CONTINUED	
Methaqualone	X.
Methaqualone hydrochloride	X.
Triclofos, sodium	LKL.
*ANTIDEPRESSANTS:	
Amitriptyline hydrochloride	MRK, PD.
Desipramine hydrochloride	RIK.
Doxepin hydrochloride	LKL.
Imipramine hydrochloride	PFZ, SK.
Maprotiline hydrochloride	CGY.
Nortriptyline hydrochloride	CGY.
Protriptyline hydrochloride	LIL.
Tryptamine hydrochloride	MRK.
*ANITUSSIVES:	
Benzonate	CGY.
Carbamphen edisylate	SK.
Carbetapentane citrate	PFZ.
*Codeine	HAL, MRK, PEX.
Dextromethorphan hydrobromide	AMD, HOF.
Hydrocodone bitartrate	HAL, MRK.
Noscipam	HAL, MRK, PEN.
Thebaine	HAL, MRK, PEN.
*TRANQUILIZERS:	
*PHENOTHIAZINE DERIVATIVES:	
Acetophenazine maleate	SCH.
Chlorpromazine hydrochloride	SK.
Fluphenazine hydrochloride	SCH.
Perphenazine	SCH.
Prochlorperazine edisylate	SK.
Prochlorperazine maleate	SK.
Promazine hydrochloride	AMD, SK.
Promethazine hydrochloride	WYT.
*OTHER TRANQUILIZERS:	
Buclizine hydrochloride	PFZ.
Chlordiazepoxide hydrochloride	SK.
Chlormecanone	SDM.
Clorazepate dipotassium	ABB.
Haloperidol	SRL.
Hydroxyzine hydrochloride	PFZ.
Hydroxyzine pamoate	PFZ.
Lorazepam	WIT.
Meprobamate	BKL.



TABLE 2. --MEDICINAL CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*EXPECTORANTS AND MUCOLYTIC AGENTS--CONTINUED	
Guaiacol	PEN.
Guaiifenesin	GAN, LLI, PEN.
Iodinated glycerol	X.
Potassium guaiacolsulfonate	HN.
*GASTROINTESTINAL AGENTS AND THERAPEUTIC NUTRIENTS:	
*CHOLINE CHLORIDE (ALL GRADES):	
Choline chloride (animal feed grade)	HFT, IMC, MUT(E), TMH.
Choline chloride (medicinal grade)	HFT.
OTHER GASTROINTESTINAL AGENTS:	
Betaine base	HFT.
Betaine hydrochloride	HFT.
Bisacodyl	PD.
Calcium polycarbophil	ILI.
Choline bicarbonate	HLI, IMC.
Choline bitartrate	HFI.
Choline citrate	HFI.
Choline dihydrogen citrate	HFI.
Cametidine	SK.
Cametidine hydrochloride	SK.
Colestipol hydrochloride	UPJ.
Dextrothroxine, sodium	BAX.
Diphenoxylate	MAL.
Docusate, calcium	ACY.
Docusate, potassium	ACY.
Docusate, sodium	ACY, MAL.
Phenolphthalein	SCH.
Sitosterols	UPJ.
THERAPEUTIC NUTRIENTS:	
Copper gluconate	PFZ.
Magnesium gluconate	PFZ.
Manganese gluconate	PFZ.
Potassium gluconate	PFZ.
Zinc gluconate	PFZ.
*HEMATOLOGICAL AGENTS:	
Ammonium heparin	ABB, RIK, SPR.
Anisindione	SCH.
Cellulose, oxidized	EKT.
Dextran	PHR.
Dicumarol	ABB.
Diphenadione	UPJ.



TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*HEMATOLOGICAL AGENTS--CONTINUED	
Lithium heparin	: RIK, SPR.
Potassium warfarin	: RSA.
Sodium heparin	: ABB, RIK, SPR.
Warfarin	: SDM.
*HORMONES AND SYNTHETIC SUBSTITUTES: ANABOLIC AGENTS AND ANDROGENS:	
Fluoxymesterone	: UPJ.
Methyltestosterone	: UPJ.
Oxandrolone	: SRL.
Testosterone	: SRL, UPJ.
Testosterone cypionate	: UPJ.
Testosterone enanthate	: UPJ.
Testosterone propionate	: SRL, UPJ.
Zeranol	: IMC.
CORTICOSTEROIDS:	
Baclomethasone	: SCH.
Betamethasone	: SCH.
Betamethasone dipropionate	: SCH.
Betamethasone sodium phosphate	: SCH.
Betamethasone valerate	: SCH.
Corrisone acetate	: UPJ.
Dexamethasone	: AMD, MRK, SCH.
Dexamethasone sodium phosphate	: MRK.
Diflorasone diacetate	: UPJ.
Fluorometholone	: UPJ.
Fluprednisolone	: UPJ.
Fluprednisolone acetate	: UPJ.
Halcinonide	: TRD.
Hydrocortisone	: UPJ.
Hydrocortisone acetate	: UPJ.
Meprednisone	: SCH.
Methylprednisolone	: ABB, UPJ.
Prednisolone	: MRK, UPJ.
Prednisolone acetate	: UPJ.
Tiamcinolone	: TRD.
Tiamcinolone acetonide	: TRD, UPJ.
Tiamcinolone diacetate	: TRD.
Corticosteroids, all other	: X.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*HORMONES AND SYNTHETIC SUBSTITUTES--CONTINUED	
ESTROGENS AND PROGESTOGENS:	
ESTROGENS:	
Chlortriamsene	: LKL.
Diethylstilbestrol diphosphate	: ARK.
Estradiol cypionate	: UPJ.
Estrogens, conjugated	: ORG.
Estrogens, all other	: ORG.
PROGESTOGENS:	
Ethisterone	: SRL, UPJ.
Hydroxyprogesterone caproate	: UPJ.
Medroxyprogesterone acetate	: UPJ.
Megestrol acetate	: UPJ.
Melengestrol acetate	: UPJ.
Norgestrel	: UPJ, WYT.
*SYNTHETIC HYPOGLYCEMIC AGENTS:	
Acetohexamide	: LIL.
Chlorpropamide	: PFZ.
Tolazamide	: UPJ.
Tolbutamide	: UPJ.
THYROID HORMONE AND ANTIHYROID AGENTS:	
Levothyroxine, sodium	: BAY.
Methimazole	: LIL.
Thiourea	: ACY.
Thyroidaloin	: NEP.
OTHER HORMONES AND SYNTHETIC SUBSTITUTES:	
Calcitonin	: ARP.
Corticotrophin	: ARP, ORG.
Dinoprost tromethamine	: UPJ.
Glucagon	: LIL.
Insulin	: ARP.
Oxytocin	: PD.
*LOCAL ANESTHETICS:	
Butamben	: ABB.
Butamben picrate	: ABB.
Cocaine	: MRK.
Dibucaine	: CGY.
Dibucaine hydrochloride	: CGY.
Lidocaine	: LEM, SDW.
Lidocaine hydrochloride	: LEM, SDW.
Omethazine	: WYT.
Pramoxine hydrochloride	: ABB.
Procaine hydrochloride	: PD.
Tetracaine	: SDW.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*LOCAL ANESTHETICS--CONTINUED	
Local anesthetics, all other	LEM.
*RENAL-ACTING AND EDEMA-REDUCING AGENTS:	
BENZOTHIADIAZINE DERIVATIVES:	
Chlorothiazide	MRK., PFZ.
Hydrochlorothiazide	ABB., CGY, MRK.
Methyclothiazide	ABB.
Trichlormethiazide	SCH.
OTHER RENAL-ACTING AND EDEMA-REDUCING AGENTS:	
Acetazolamide	ACY.
Amiloride hydrochloride	MRK.
Dichlorophenamide	MRK.
Ethacrynic acid	MRK.
Furosemide	MRK.
Probenecid	MRK.
Spironolactone	SRL.
Sulfapyrazone	CGI.
Tiaramerene	GAN., SK.
*SMOOTH MUSCLE RELAXANTS:	
Aminophylline	GAN., MAL, SRL.
Cinnamidine hydrochloride	SDM.
Flavokate hydrochloride	SK.
Oxtriphylline	NEP., PD.
Papaverine hydrochloride	LIL.
Theophylline sodium glycinate	CHT.
*VITAMINS:	
VITAMIN A:	
Beta carotene (provitamin A)	HOF.
Tretinoin (vitamin A acid)	EK.
Vitamin A acetate (animal feed grade)	HOF.
Vitamin A acetate (medicinal grade)	HOF.
Vitamin A alcohol	HOF.
Vitamin A palmitate (animal feed grade)	HOF.
Vitamin A palmitate (medicinal grade)	HOF.
Vitamin B-COMPLEX:	
NIACIN AND DERIVATIVES:	
Niacin (animal feed grade)	NEP.
Niacinamide (medicinal grade)	NEP., RIL.
Niacinamide (animal feed grade)	NEP., RIL.
PANTOTHENIC ACID DERIVATIVES:	
d-Calcium pantothenate (animal feed grade)	DAE.
d-Calcium pantothenate (medicinal grade)	DAT.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*VITAMINS--CONTINUED	
VITAMIN B-COMPLEX--CONTINUED	
PANTOTHENIC ACID DERIVATIVES--CONTINUED	
di-calcium pantothenate (animal feed grade)--	HFT.
di-calcium pantothenate - calcium chloride complex--	HFT.
Dexpantenol--	HOF.
Panthenol--	HOF.
OTHER B-COMPLEX VITAMINS:	
Biotin--	HOF.
Cyanocobalamin (animal feed grade)--	MRK.
Cyanocobalamin (medicinal grade)--	MRK.
Cyanocobalamin (U.S.P. crystalline)--	MRK.
Pyridoxine--	HOF.
Riboflavin (animal 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, PFZ.
Sodium ascorbate--	HOF, PFZ.
VITAMIN D:	
Cholecalciferol (vitamin D <sub>3</sub> )--	DA(CE), VTM.
Ergocalciferol (vitamin D <sub>2</sub> )--	VTM.
*VITAMIN E:	
DL-ALPHA TOCOPHERYL ACETATE (ALL GRADES):	
di- $\alpha$ Tocopheryl acetate (animal feed grade)--	BAS, DA(CE), HOF.
di- $\alpha$ Tocopheryl acetate (medicinal grade)--	BAS, EKT, HOF.
OTHER VITAMIN E:	
d- $\alpha$ Tocopherol--	EKT, SCP.
di- $\alpha$ Tocopherol--	HOF.
d- $\alpha$ Tocopheryl acetate--	EKT, SCP.
d- $\alpha$ Tocopheryl acid succinate--	EKT, SCP.
VITAMIN K:	
MENADIONE SODIUM BISULFITE:	
Menadione sodium bisulfite (anhydrous)--	ABB.
Menadione sodium bisulfite (trihydrate)--	HET.
OTHER VITAMIN K:	
Menadione--	ABB.
*MISCELLANEOUS MEDICINAL CHEMICALS:	
ANTINEOPLASTIC AGENTS:	
Azathioprine--	BUR.
Cytarabine--	UPJ.

TABLE 2.--MEDICINAL CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MEDICINAL CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*MISCELLANEOUS MEDICINAL CHEMICALS--CONTINUED	
ANTINEOPLASTIC AGENTS--CONTINUED	
Mercaptopurine	BUR.
Streptozocin	PFN, UPJ.
Thioguanine (hemihydrate)	BUR.
Vinblastine sulfate	LIL.
Vincristine sulfate	LIL.
CARDIOVASCULAR AGENTS:	
ANTIHYPERTENSIVE AGENTS:	
Captopril	TRD.
Diazoxide	SCH.
Guanethidine sulfate	CGI.
Hydralazine hydrochloride	CGI.
Methyldopa	MRK.
Metoprolol tartrate	CGY.
Nadolol	TRD.
Pargyline hydrochloride	ABB.
Prazosin hydrochloride	PFZ.
Rauwolfia serpentina	PEN.
Reserpine	PEN.
BIOFLAVONOIDS:	
Hesperidin	SKG.
Lemon bioflavonoid complex	SKG.
Naringin	SKG.
Orange-lemon flavonate	SKG.
VASODILATORS:	
Amyl nitrite	BUR.
Isosuprine	AMD.
Oxpreanol hydrochloride	CGY.
OTHER CARDIOVASCULAR AGENTS:	
Disopyramide phosphate	SRL.
Procainamide hydrochloride	OMS, PD.
DIAGNOSTIC AGENTS:	
ROENTGENOGRAPHIC CONTRAST MEDIA:	
Diatrizoate, meglumine	OMS, SDM.
Diatrizoate, sodium	OMS, SDM.
Iodipamide, meglumine	OMS.
Iopanoic acid	SDM.
Iothalamate, meglumine	MAL.
Meglumine	SDM.
OTHER DIAGNOSTIC AGENTS:	
Albumin	SPR.
Glutaryl-p-nitroaniline (liver function test)	REG.

TABLE 2.--MEDICAL CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER,  
1981--CONTINUED

	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MEDICAL CHEMICALS	
*MISCELLANEOUS MEDICAL CHEMICALS--CONTINUED	
DIAGNOSTIC AGENTS--CONTINUED	
OTHER DIAGNOSTIC AGENTS--CONTINUED	
Metyrapone	CGY.
UNCLASSIFIED MEDICAL CHEMICALS:	
Allopurinol (xanthine oxidase inhibitor)	BUR. GAN.
Ciomiphen citrate	LKI.



## STATISTICAL HIGHLIGHTS

Eric Land

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

Total domestic production of flavor and perfume materials in 1981 amounted to 164.6 million pounds. Sales of these materials in 1981 amounted to 118.6 million pounds, valued at \$251.6 million, compared with 129.0 million pounds, valued at \$253.5 million, in 1980. 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 1981 declined by 5.8 percent from the level in 1980 while the quantity of sales decreased by 8.1 percent.

Production of cyclic flavor and perfume materials in 1981 amounted to 93.1 million pounds; sales amounted to 68.7 million pounds, valued at \$157.7 million. Individual publishable chemicals in the cyclic group produced in the greatest volume in 1981 were  $\alpha$ -terpineol, anethole, and benzyl acetate.

U.S. output of acyclic flavor and perfume materials in 1981 amounted to 71.4 million pounds; sales of these materials amounted to 49.9 million pounds, valued at \$93.9 million. Monosodium glutamate was by far the most important of the acyclic chemicals in 1981, although the data are not publishable. Other important acyclic compounds included linalyl alcohol, citronellol, and linalyl acetate.





TABLE 1.--FLAVOR AND PERFUME MATERIALS: U.S. PRODUCTION AND SALES, 1981

[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]

FLAVOR AND PERFUME MATERIALS	SALES			
	PRODUCTION	QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total-----	164,563	118,552	251,595	\$2.12
CYCLIC				
Total-----	93,136	68,673	157,708	2.30
<i>Benzenoid and Naphthalenoid</i>				
Total-----	77,190	57,922	109,962	1.90
4-Allyl-2-methoxyphenol (Eugenol)-----	401	261	989	3.78
Benzyl acetate-----	1,134	...	...	...
Benzyl propionate-----	26	...	...	...
Cinnamyl acetate-----	12	13	93	6.97
Isobutyl phenylacetate-----	33	23	69	3.03
p-Methylanisole-----	63	91	218	2.40
2-Phenethyl phenylacetate-----	28	14	87	6.18
p-Propenylanisole (Anethole)-----	2,455	2,650	6,365	2.40
All other benzenoid and naphthalenoid materials-----	73,038	54,870	102,141	1.86
<i>Terpenoid, Heterocyclic, and Aliphatic</i>				
Total-----	15,946	10,751	47,746	4.44
Cedryl acetate-----	250	145	611	4.20
Dihydrondicyclopentadienyl acetate-----	168	131	211	1.60
Ionones-----	130	106	961	9.11
dl-Menthol, synthetic-----	659	598	1,748	2.92
Methylionine (α and β)-----	748	584	4,709	8.06
α-Terpineol-----	3,426	2,937	2,330	.79
α-Terpinyl acetate-----	985	...	...	...
Vetivenyl acetate-----	38	...	...	...
All other terpenoid, heterocyclic, and alicyclic materials-----	9,542	6,250	37,176	5.95
ACYCLIC				
Total-----	71,427	49,879	93,887	1.88
Allyl heptanoate-----	3	4	28	6.18
Allyl hexanoate-----	...	59	227	3.86
Butyl butyryl lactate-----	59	50	259	5.13
Citronellyl acetate-----	55	44	249	5.63
Citronellyl formate-----	24	13	126	9.37
Citronellyl isobutyrate-----	...	5	43	8.17
3,7-Dimethyl-cis-2,6-octadien-1-ol (Nenol)-----	...	287	424	1.48
3,7-Dimethyl-cis-2,6-octadien-1-ol acetate (Neryl acetate)-----	27	23	111	4.83
3,7-Dimethyl-1,6-octadien-3-ol (Linalool; linalyl alcohol)-----	2,605	...	...	...
3,7-Dimethyl-1,6-octadien-3-ol acetate (Linalyl acetate)-----	856	...	...	...
3,7-Dimethyl-6-octen-1-ol (Citronellol)-----	2,399	1,753	7,115	4.06
Ethyl heptanoate-----	13	7	27	3.69
Ethyl hexanoate (Ethyl caproate)-----	18	11	42	3.91

See footnote at end of table.

TABLE 1.--FLAVOR AND PERFUME MATERIALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	PRODUCTION	SALES			UNIT VALUE <sup>1</sup>
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>	
ACYCLIC--Continued	1,000 pounds	1,000 pounds	1,000 dollars		Per pound
Ethyl myristate-----	9	...	...		...
Geranyl acetate-----	193	146	684		\$ 4.69
Geranyl formate-----	19	18	120		6.83
Isopentyl butyrate-----	99	89	169		1.91
Isopentyl isovalerate-----	...	14	60		4.24
N-Octyl acetate-----	...	1	6		5.88
Rhodinol-----	5	...	...		...
Undecanol-----	8	...	...		...
All other acyclic materials-----	65,035	47,355	84,197		1.78

<sup>1</sup>Calculated from the unrounded figures.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

(CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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)

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC	
CYCLIC:	
BENZENOID AND NAPHTHALENOID:	
Acetaldehyde, diphenethyl acetal (Phenylethyl acetal)-----	: GIV.
2'-Acetonaphthone ( $\beta$ -Methyl naphthyl ketone)-----	: GIV.
1-Acetoxy-2-sec-butyl-1-ethnycyclohexane-----	: GIV.
p-Allylanisole-----	: SCH, X.
Allyl anthranilate-----	: RT.
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)-----	: CI.
* 4-Allyl-2-methoxyphenol (Eugenol)-----	: BBS, CI, ELN, FB, GIV, IFF, UNG.
4-Allyl-2-methoxyphenol acetate (Eugenol acetate)-----	: CI, ELN, IFF.
4-Allyl-1,2-(methylenedioxy)-benzene (Safrole)-----	: FB.
Allyl phenoxyacetate-----	: GIV.
o-Neryl cinnamic aldehyde-----	: IFF.
p-Nisaldehyde-----	: GIV, OPC.
Nisyl acetate-----	: ELN, OPC.
Nisyl butyrate-----	: RT.
Nisyl caproate-----	: RT.
aurantol-----	: BPS.
Benzaldehyde glyceryl acetal-----	: GIV.
Benzophenone-----	: CMN, PD.
* Benzyl acetate-----	: GIV, MON, SBC.
Benzyl benzoate-----	: CIN, MOR.
Benzyl butyrate-----	: ELN, FB, PFZ.
Benzyl cinnamate-----	: FB.
Benzyl formate-----	: ELN, GIV.
Benzyl isobutyrate-----	: ELN.
Benzyl isopentyl ether-----	: GIV.
Benzyl isovalerate-----	: ELN, FB.
Benzyl laurate-----	: ELN, FB.
1-(Benzylloxy)-2-methoxy-4-propenylbenzene (Benzyl isoeugenyl ether)-----	: GIV.
Benzyl phenylacetate-----	: ELN, GIV.
* Benzyl propionate-----	: ELN, FB, SBC.
Benzyl salicylate-----	: FB, GIV, IFF, MON, SBC.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
4-tert-Butyl-2',6'-dimethyl-3',5'- dinitroacetophenone (Musk Ketone)-	GIV.
6-tert-Butyl-3-methyl-2,4-dinitroanisole (Musk sbrrette)	GIV. GIV, RDA.
p-tert-Butyl- $\alpha$ -methylhydrocinnamalehyde-	
1-tert-Butyl-3,4,5-trimethyl-2,6-dinitrobenzene (Musk tibetene)	GIV.
5-tert-Butyl-2,4,6-trinitro-m-xylene (Musk xylol)	GIV.
Carvacrof	GIV.
Cinnamaldehyde	CI, FB.
Cinnamic aldehyde dimethyl acetal	CI.
* Cinnamyl acetate	ELN, FB, GIV.
Cinnamyl alcohol	FB.
Cinnamyl anthranilate	FEL, RT.
Cinnamyl butyrate	FB.
Cinnamyl cinnamate	FB.
Cinnamyl propionate	ELN, FB.
Cinnamyl tiglate	FB.
Coumarin	RDA.
Cumyl acetate	IFF.
Cumyl alcohol	GIV, IFF.
Cumyl formate	IFF.
trans- $\beta$ -caryophyllol	IFF.
2,4-Dibromo-6-nitro-m-cresyl methyl ether-	GIV.
1,2-Dimethoxy-4-propenylbenzene (4- Propenylveratrole)	FB.
Dimethyl benzene ethanol acetate	IFF.
3,7-Dimethyl-2,6-octadienyl phenylacetate (Geranyl phenylacetate)	GIV, SBC.
$\alpha,\alpha$ -Dimethylphenethyl acetate	IFF.
$\alpha,\alpha$ -Dimethylphenethyl alcohol	IFF.
$\alpha,\alpha$ -Dimethylphenethyl butyrate	IFF.
Dimehyl phenylethyl carbonyl	IFF.
Dimehyl phenylethyl carbonyl acetate	IFF.
Diphenylmethane (Benzylbenzene)	FB.
1,3-Diphenyl-2-propanone (Dibenzylketone)-	GIV.
p-Ethoxybenzaldehyde	GIV.
2-Ethoxyaphthalene	GIV.
Ethyl anthranilate	FB.
Ethyl benzoate	ELN.
Ethyl cinnamate	ELN.
Ethyl- $\alpha,\beta$ -epoxy- $\beta$ -methylhydrocinnamate-	ELN.

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
2-ethyl hexyl salicylate	FEL, OFC.
Ethyl phenylacetate	ELN, GIV.
Ethyl phenylglycidate	GIV.
Ethyl salicylate	FB.
Geranyl benzoate	GIV.
$\alpha$ -Hexylcinnamaldehyde	GI, IFF.
Hexyl salicylate	IFF.
Hydratropaldehyde	GIV, IFF.
Hydratropaldehyde, dimethyl acetal	GIV, IFF.
Hydrocinamic acid	ELN.
Hydrocumazin	GIV.
Hydroxy citronellal methyl anthranilate	FB, GIV.
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	MON, RDA.
4-Hydroxy-3-methoxybenzaldehyde [Vanillin]	MON.
4(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillylacetone)	GIV.
Indole	GIV.
Isoamyl phenylacetate	ELN, FB.
Isoamyl salicylate	IFF.
Isobutyl benzoate	ELN, SEC.
p-Isobutyl- $\alpha$ -methylhydrocinnamaldehyde (Rhodial)	RDA.
Isobutyl phenylacetate	ELN, FB, OFC.
Isobutylquinoline	IFF.
Isobutyl salicylate	FB.
Isobutenyl tetrahydrobenzaldehyde (Myrac aldehyde)	IFF.
Isopentyl benzoate	GIV.
Isopentyl salicylate	FB, MON.
Isopropylbenzaldehyde (Cumaldehyde)	GIV.
p-Isopropyl- $\alpha$ -methylhydrocinnamaldehyde (Cyclamen aldehyde)	RDA.
p-Isopropyl- $\alpha$ -methylhydrocinnamyl alcohol	GIV.
l-limonene	SCM.
Linalyl anthranilate	BDS, FMT.
Linalyl benzoate	GIV, HOF.
Linalyl cinnamate	HOF.
p-Mentha-1,8-diene (Limonene)	IFF, SKG.
Menthyl anthranilate	FB, PFW.
p-Methoxybenzyl alcohol (Anisyl alcohol)	ELN, GIV, OFC.
o-Methoxy cinnamic aldehyde	FB.
o-Methoxy cinnamic aldehyde crystals	CI.
2-Methoxyaphthalene	GIV.



TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1961--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
BENZENOID AND NAPHTHALENOID--CONTINUED	
Phenylethyl tiglate	FB.
3-Phenyl-1-propanol (Hydrocinnamic alcohol)	ELN, FB.
3-Phenylpropyl acetate	ELN, GIV.
3-Phenylpropyl cinnamate	FB.
Phenyl propyl pyrazine acetate	IFF.
Piperonal (Heliotropin)	ANB.
*p-Propenylanisole (Anethole)	ARZ, HPC, NCI, SCM.
4-Propenyl-1,2-dimethoxybenzene (Methyl isoeugenol)	CI.
p-Propylanisol	FB, GIV.
SWEETENERS, SYNTHETIC:	
Saccharin (1,2-Benzisothiazolin-3-one, -1,1-dioxide)	SM.
Saccharin, sodium salt	SW.
Synthetic sweetener material, all other	ABB.
p-Tolualdehyde	FB, GIV.
p-Tolylacetaldehyde	GIV.
p-Tolyl acetate	ELN.
p-Tolyl isobutyrate	GIV.
p-Tolylphenylacetate	GIV.
Trimethylcyclohexyl salicylate	ARS.
All other benzenoid or naphthalenoid chemicals	ARS, IFF, PFM.
TERPENOID, HETEROCYCLIC, AND ALICYCLIC:	
Acetyl-n-butyl (2,3-Hexanedione)	FB.
Acetyl cedrene (Vertoflex)	BDS.
Acetyl isovaleryl (5-Methyl-2,3-hexanedione)	FB.
Acetyl propionyl (2,3-pentanedione)	FB.
allyl-citronene	IFF, X.
allyl-cyclohexyl p-opsionate	GIV.
allyl-cyclohexyl p-opsionate	BDS, GIV.
Amlyis acetate	IFF.
Beta methyl ionone coevr	FB, RT.
Bornyl isovalerate	IFF.
2-tert-Butylcyclohexanol	IFF.
P-tert-Butylcyclohexyl acetate (Verbenian)	CI, IFF.
P-tert-Butylcyclohexanone	IFF.
2-sec-Butylcyclohexanone	GIV.
o-tert-Butylcyclohexyl acetate	IFF.
Cadinene	FB.
Carvone oxide	OPC.
$\beta$ -Caryophyllene	CI, GIV, SCM.
Caryophyllene acetate	CI.



TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
TERPENOID, HETEROCYCLIC, AND ALICYCLIC--CONTINUED	
$\alpha$ -Cedrene epoxide (Andrane)-	IFF.
Cedrenol - - - - -	BDS, ELN, IFF.
Cedrol - - - - -	ELN.
*Cedryl acetate - - - - -	BDS, ELN, IFF, UNG.
Cedryl formate - - - - -	IFF.
Cyclohexyl acetate - - - - -	RT.
2-Cyclohexylcyclohexanone - - - - -	GIV.
Cyclohexyl isovalerate - - - - -	RT.
*Dihydroindicyclopentadienyl acetate (Cyclacet)-	CI, IFF, OPC.
Dihydroindicyclopentadienyl isobutyrate - - - - -	IFF.
Dihydroindicyclopentadienyl propionate (Cyclaprop) (Verdyl propionate extra) - - - - -	CI, IFF.
Dihydroterpinyl acetate - - - - -	IFF, NCI.
Furfural acetone - - - - -	IFF, NCI, SCM.
Furfural acetone - - - - -	RT.
Galaxolide (1,3,4,6,7,8-Hexahydro-4,6,7,8-hexamethyl-cyclopenta-7-2-benzopyran) - - - - -	IFF.
Guaiacwood acetate - - - - -	ELN, FB, GIV, UNG.
Guaiene - - - - -	FB.
DI-Hydro-iso-jasmone (Ethylmatol) - - - - -	FB.
3-Hydroxy-2-ethyl-4-pyrone - - - - -	PFZ.
4-(4-Hydroxy-4-methyl pentyl)-3-cyclohexene-10-carboxaldehyde (Lyral) - - - - -	IFF.
3-Hydroxy-2-methyl-4-pyrone (Maltol) - - - - -	PFZ.
4-Hydroxynonan-2-yl 7-lactone (Maltol) - - - - -	ELN.
4-Hydroxynonan-2-yl 7-lactone (7-Nonalactone) (7-Undecalactone) - - - - -	FB.
Ionone( $\alpha$ - and $\beta$ -) - - - - -	BDS, GIV, NCI.
$\alpha$ -Ionenone - - - - -	BDS, GIV, HOF, IFF.
$\beta$ -Ionenone - - - - -	BDS, HOF.
Isoamyl furoate - - - - -	RT.
Isobornyl acetate - - - - -	NCI, RDA.
Isobornyl propionate - - - - -	ELN.
Isocamphyl cyclohexanol - - - - -	GIV.
Isosamone - - - - -	FB.
Isomenthone - - - - -	GIV.
2-Isopropylcyclohexanol - - - - -	GIV.
Isopulegyl acetate - - - - -	GIV.
Jasmal - - - - -	IFF.
p-Mentha-1,3-diene ( $\alpha$ -Terpinene) - - - - -	SCM.
p-Mentha-1,4-diene (7-Terpinene) - - - - -	SCM.
CYCLIC--CONTINUED	

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
TERPENOID, HETEROCYCLIC, AND ALICYCLIC--CONTINUED	
p-Mentha-6,8-dien-2-ol (Laevo carveol) --	FB.
p-Mentha-6,8-dien-2-one (Dextro-carvone) --	FB.
(Carvol) --	FB.
1-p-Mentha-6,8-dien-2-yl acetate (Laevo-carvyl acetate) --	FB.
p-Menth-8-en-3-ol (Isopulegol) --	GIV.
p-Menth-1-en-3-one (Piperitone) --	GIV.
p-Menth-4-(8)-en-3-one (Pulegone) --	GIV.
1-1-p-Menthen-6-yl-1-propanone --	GIV.
d-Menthol --	SCM.
*dl-Menthol, synthetic --	GIV, HAR, NCI, SCM.
l-Menthol, synthetic --	GIV, HAR, SCM.
l-Menthone --	SCM.
Menthyl acetate --	SCM.
l-Menthyl acetate --	SCM.
Methyl furoate --	RT.
*Methylionone( $\alpha$ - and $\beta$ -) --	BDS, GIV, IFF, NCI.
7-Methylionone --	GIV, NCI.
6-Methyl- $\alpha$ -ionone --	GIV.
Hopyl --	NCI.
Hopyl acetate --	FEL, NCI.
3-Pentyl tetrahydro-4-pyridine --	IFF.
Rose oxide --	MC, FB.
$\alpha$ -Santalol --	GIV, IFF.
$\beta$ -Santalol --	GIV.
Sassafras oil, hydrogenated --	GIV.
Terpineol( $\alpha$ - and $\beta$ -) --	HFC, NCI, SCM.
* $\alpha$ -Terpineol --	IFF, NCI, SCM.
$\alpha$ -Terpinyl propionate --	ELN.
[4,4',4'',4''',4''''-Tetraaminophthalocyanato(2-)]-copper --	HFC.
3,3,5-Triethyl cyclohexanol (Homomenthol) --	ARS.
1-(2,6-Triethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one (Allyl- $\alpha$ -ionone) --	IFF.
Vetivonal --	GIV.
*Vetivonal acetate --	BDS, FB, GIV, IFF.
All other terpenoid, heterocyclic, or alicyclic flavor and perfume chemicals --	BDS, IFF, OPC, RT, SCM, VIK.

TABLE 2. --FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Allyl heptanoate	ELM, FB, RT.
*Allyl hexanoate	ELM, FB, UMG.
Allyl isothiocyanate (Synthetic mustard oil)	OPC.
Allyl isovalerate	RT.
Allyl mercaptan	RT.
Allyl octanoate (Allyl caprylate)	RT.
Allyl sulfide	RT.
Ammonium isovalerate	RSA.
Butter acids	RT.
Butter esters	RT.
Butyl butyrate	FB.
*Butyl butyryl lactate	ARS, BJL, RT.
Butyl undecylenate	FB, GIV.
Citral dimethyl acetal	CI, GIV, IFF.
Citronellal acid	PFM.
*Citronellal acetate	ELM, GIV, IFF, NCI.
Citronellyl butyrate	GIV, IFF.
Citronellyl ethyl ether	IFF.
*Citronellyl formate	ELM, GIV, IFF.
*Citronellyl isobutyrate	ELM, GIV, IFF.
Citronellyl nitrile	CI.
Citronellyl oxoacetaldehyde	IFF.
Citronellyl propionate	GIV, IFF.
Crude acetate mixture (Linalyl,neryl,geranyl acetates, main components)	X.
Decanal (Capraidehyde)	CI, GIV.
Decyl acetate	GIV.
Diethyl acetal	FB.
Diethyl sebacate	ELN.
Diethyl succinate	ELN.
d-Dihydrocarveol	SCM.
Dihydrocarvone	SCM.
Dihydrolinalool	SCM.
Dihydro myrcenol	IFF.
2,6 Dimethyl-5-hepten-1-al	GIV.
Dimethyl hexanedioi	X.
Dimethyl hexanedioi	X.
3,7-Dimethyl-2,3,6-nonadienenitrile	GIV.
3,7-Dimethyl-trans-2,6-octadienal (Citral A geranial)	FB, FEL.
3,7-Dimethyl-2,6-octadienal (citral a,b)	NCI, SCM.
*3,7-Dimethyl-cis-2,6-octadien-1-ol (Nerol)	ELN, FB, GIV, IFF, NCI, SCM.

## ACYCLIC

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
3,7-Dimethyl-trans-2,6-octadien-1-ol (Geraniol)-	: ELM, FB, FEL, GIV, IFF, NCI, SCM.
*3,7-Dimethyl-1,6-octadien-3-ol (Linalool)	: ELM, FB, FEL, GIV, IFF, NCI, SCM.
(Linalyl alcohol) -	: ELM, FB, FEL, GIV, IFF, NCI, SCM.
*3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate) -	: CI, ELM, GIV, IFF, NCI.
*3,7-Dimethyl-1,6-octadien-3-ol,acetate (Linalyl acetate) -	: ELM, FB, GIV, NCI, SCM.
3,7-Dimethyl-1,6-octadien-3-yl isobutyrate (linalyl isobutyrate) -	: ELM.
3,7-Dimethyl-1,6-octadien-3-yl propionate (linalyl propionate) -	: ELM, GIV, HOF.
Dimethyloctanal -	: SCM.
3,7-Dimethyloctanol-1 (Tetrahydrogeraniol) -	: GIV, NCI, SCM.
3,7-Dimethyl-3-octanol -	: GIV, HOF, IFF, SCM.
Dimethyloctanyl acetate -	: IFF.
3,7-Dimethyl-6-octen-1-al (Citronellal) -	: FB, GIV, SCM.
*3,7-Dimethyl-6-octen-1-ol (Citronellol) -	: ELM, FB, GIV, IFF, NCI, SCM.
3,7-Dimethyl-7-octenol 70%, 6-octenol isomer 30% Dimyrcetol -	: GIV.
Ethyl butyrate -	: IFF.
Ethyl caprylate -	: FB, NW.
Ethyl caproate -	: ELM, FB.
Ethyl crotonate -	: RT.
Ethyl formate -	: FB, RT.
*ethyl heptanoate -	: ELM, FB, FEL, RT.
Ethyl heptenone -	: HOF.
Ethyl hexanoate -	: ELM, FB, NW.
Ethyl isobutyrate -	: FB.
Ethyl isovalerate -	: ELM, FB.
Ethyl laurate -	: ELM, FB.
Ethyl linalool (3,7-Dimethyl-1,6-nonadien-3-ol)-	: HOF.
Ethyl linalyl acetate (3,7-Dimethyl-1,6-nonadien-3-ol, acetate) -	: HOF.
Ethyl-2-methyl butyrate -	: PFW, SCM.
Ethyl-2 methyl pentanoate -	: PFM.
*Ethyl myristate -	: ELM, PFM, RT.
Ethyl nonanoate -	: ELM, FB.
Ethyl octanoate -	: ELM, FB.
Ethyl oxhydrate -	: RT.
Ethyl propionate -	: FB, NW.
Ethyl valerate -	: ELM.
*Geranyl acetate -	: CI, ELM, FEL, GIV, IFF, NCI, PFM, SCM.

ACYCLIC--CONTINUED

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Geranyl butyrate	: ELN, GIV.
Geranyl crotonate	: FB.
Geranyl formate	: BDS, ELN, GIV.
Geranyl isobutyrate	: IFF.
Geranyl isovalerate	: FB.
Geranyl nitrile (Gerano nitrile) (Citralva)	: CI, IFF.
Geranyl propionate	: ELM, FB.
Geranyl tiglate	: FB.
Glutamic acid, monosodium salt (Monosodium glutamate)	: SFF.
Heptanolide	: FB.
N-hexanal	: SCM.
Hexanoic acid [Caproic acid]	: SCM.
2-Hexenal	: FB, GIV.
cis-3-Hexen-1-ol	: GIV.
2-Hexenol	: FB, SCM.
cis-3-Hexen-1-yl acetate	: BDS, GIV.
cis-3-Hexenyl butyrate	: SCM.
Hexyl caproate	: FB.
3-Hexynol	: HOF.
3-Hydroxy-2-butanone (Acetoin)	: FMT.
Hydroxycitronellol	: SCM.
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	: GIV, IFF, SCM.
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (Hydroxycitronellal, dimethyl acetal)	: GIV.
Isoamyl caproate	: FB.
Isoamyl caprylate	: FB.
Isoamyl propionate	: FB.
Isoamyl acetate	: FB.
Isoamyl butyrate	: ALD, FB.
Isohydro lavandulol	: FB.
Isohydro lavandulylacetate	: FB.
Isohydro lavandulylaldehyde	: FB.
Isoamyl acetate (Isoamyl acetate)	: ELN, FB, NM, PFM.
* Isopentyl butyrate	: FB, GIV, NM.
* Isopentyl formate	: ELN, FB, RT.
* Isopentyl isovalerate	: ELN, FB, PFM.
laualdehyde	: FB, GIV.
linalyl formate	: HOF.
Methoxy citronellal	: SCM.

ACYCLIC--CONTINUED

TABLE 2.--FLAVOR AND PERFUME MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

FLAVOR AND PERFUME MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Methyl butynol	: X.
Methyl crotonate	: FB, RT.
3-Methyl-5-heptanone oxime	: GIV.
Methyl isobutyrate	: PFM.
Methyl isovalerate	: FB.
3-methyl-2-(and)inonene nitrile	: GIV.
Methyl-2-nonenolate	: GIV, PFM.
Methyl-octyl aldehyde	: CI.
Methylol methyl heptyl ketone	: GIV.
4-Methyl pentanoic acid	: PFM.
Methyl pentylol	: X.
6 Methyl thiopropionaldehyde	: RT.
2-Methylundecanal	: CI, GIV.
Myrcenyl acetate	: IFF.
Myristaldehyde	: GIV.
Nonanal	: CI, GIV.
1,3-Nonanediol acetate	: CI, GIV.
Nonyl acetate	: CI, GIV.
Octameryl acetate	: CI, ELM.
Octanal	: IFF.
3-Octanol	: CI, GIV.
3-Octanone (Ethyl amyl ketone)	: SCM.
*N-Octyl acetate	: GIV.
N-Octyl alcohol	: ELM, FB, SCM.
Pseudo linalyl acetate (Neobergamate)	: GIV.
Rhodinol	: IFF.
Rhodinyl acetate	: BBS, FB, FEL, GIV, IFF.
Teptyl acetate	: GIV, IFF.
Tetrahydro allo-ocimene	: ELM.
*Undecanal	: IFF.
9-Undecenal	: CI, GIV, IFF.
All other acyclic flavor and perfume materials	: ARS, BDS, CI, FB, FMT, HOF, IFF, PFM, SBC, SCM, X.

ACYCLIC--CONTINUED

TABLE 3.--FLAVOR AND PERFUME MATERIALS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of flavor and perfume materials to the U.S. International Trade Commission for 1981 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	IFF	: International Flavors & Fragrances, Inc.
AIC	: Albany International Corp.		
ALD	: Aldrich Chemical Co., Inc.	MON	: Monsanto Co.
AMB	: American Bio-Synthetics Corp.		
ARS	: Arsynco, Inc.	NCI	: Union Camp Corp., Terpene and Aromatics Div.
ARZ	: Arizona Chemical Co.	NW	: Northwestern Chemical Co.
BDS	: Biddle Sawyer	OPC	: Orbis Products Group
BJL	: Burdick & Jackson Laboratories, Inc.		
		PD	: Warner-Lambert Co.
CI	: Chem-Fleur, Inc.	PFW	: Hercules, Inc., PFW Div.
CLN	: Stockhausen, Inc.	PFZ	: Pfizer, Inc.
CWN	: Upjohn Co., Fine Chemical Div.		
		RDA	: Rhone-Poulenc, Inc.
ELN	: Elan Chemical Co.	RSA	: R.S.A. Corp.
		RT	: Ritter International
FB	: Fritzsche Dodge & Olcott, Inc.		
FEL	: Felton International, Inc.	SBC	: Scher Chemicals, Inc.
FMT	: Fairmount Chemical Co., Inc.	SCM	: SCM Corp., Organic Chemicals Div.
		SFF	: Stauffer Chemical Co., Food Ingredients Div.
GIV	: Givaudan Corp.	SKG	: Sunkist Growers, Inc.
		SW	: Sherwin-Williams Co.
HAR	: Haarmann & Reimer Corp.		
HN	: Tenneco Chemicals, Inc.	UNG	: Ungerer & Co.
HOP	: Hoffmann-LaRoche, Inc.		
HPC	: Hercules, Inc.	VIK	: Viking Chemical Co.

Note.--Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 34 reporting companies and company divisions for which permission to publish was not restricted.

## STATISTICAL HIGHLIGHTS

Edward J. Taylor

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

Statistics on U.S. production and sales of synthetic plastics and resin materials for 1981 are given in table 1. U.S. production of plastics and resin materials in 1981 totaled 40,601 million pounds, or 6.3 percent more than the 38,186 million pounds produced in 1980. Sales in 1981 totaled 36,107 million pounds, valued at \$17,092 million, compared with 33,550 million pounds, valued at \$16,011 million, in 1980.

Thermosetting materials are those which harden with a change in composition in the final treatment so that in their final state as finished articles they are substantially infusible and insoluble, that is, they cannot again be softened by heat or solvents. U.S. production of thermosetting materials totaled 7,295 million pounds in 1981, compared with 7,064 million pounds in 1980. Production of the most important products in 1981 included phenolic resins (1,688 million pounds), amino (or urea and melamine) resins (1,495 million pounds), polyester resins, unsaturated (1,132 million pounds), and alkyd resins (717 million pounds).

Thermoplastic materials are those which in their final state as finished articles can be repeatedly softened by heat and hardened by a decrease in temperature. U.S. production of thermoplastic materials totaled 33,306 million pounds in 1981 (or 82.0 percent of the total output for 1981), compared with 31,122 million pounds in 1980. Production of the most important products in 1981 included polyethylene (12,604 million pounds), vinyl resins (6,962 million pounds), and styrene type materials (5,915 million pounds).





TABLE 1.--PLASTICS AND RESIN MATERIALS: U.S. PRODUCTION AND SALES, 1981

[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 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]

PLASTICS AND RESIN MATERIALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000	1,000		
	pounds	pounds	1,000	Per
	dry basis <sup>2</sup>	dry basis <sup>2</sup>	dollars	pound
Grand total-----	40,601,020	36,106,551	17,092,269	\$0.47
Plastics and resin materials, benzenoid <sup>3</sup> -----	11,729,680	10,470,900	6,836,908	.65
Plastics and resin materials, nonbenzenoid-----	28,871,340	25,635,651	10,255,361	.40
THERMOSETTING RESINS				
Total-----	7,295,480	5,775,068	3,414,752	.59
Alkyd resins, total-----	717,018	419,600	272,759	.65
Alkyd-acrylate copolymer resins-----	1,523	...	...	...
Phthalic anhydride type-----	550,171	342,418	212,302	.62
Polybaaic acid type-----	74,488	26,147	23,237	.89
Styrenated-alkyds or copolymer alkyds-----	16,302	11,555	9,027	.78
Vinyl toluene alkyds-----	39,135	32,080	20,231	.63
Other copolymer alkyds-----	35,399	7,400	7,962	1.08
Dicyandiamide resins-----	2,068	1,872	2,197	1.17
Epoxy resins: <sup>4,5</sup>				
Unmodified-----	361,144	277,404	326,555	1.18
Advanced-----	(120,116)	(96,185)	(128,020)	(1.33)
Furfuryl type resins-----	23,581	23,323	16,858	.72
Glyoxal-formaldehyde resins-----	12,424	7,708	6,178	.80
Melamine-formaldehyde resins (an amino resin)-----	189,742	161,486	130,368	.81
Phenolic and other tar acid resins-----	1,687,954	1,302,193	655,989	.50
Polyester resins, unsaturated <sup>6</sup> -----	1,132,398	1,001,013	664,837	.66
Polyether and polyester polyols for urethanes <sup>7</sup> -----	1,457,089	1,122,692	642,560	.57
Polyurethane elastomers and plastics products, total-----	294,729	244,789	311,860	1.27
Elastomers <sup>8</sup> -----	141,667	120,223	190,986	1.59
Plastics-----	153,062	124,566	120,874	.97
Silicone resins-----	17,328	8,264	28,864	3.49
Urea-formaldehyde resins (an amino resin)-----	1,305,635	1,134,762	250,007	.22
Other thermosetting resins <sup>9</sup> -----	94,370	69,962	105,720	1.51
THERMOPLASTIC RESINS				
Total-----	33,305,540	30,331,483	13,677,517	.45
Acrylic resins, total <sup>10</sup> -----	1,100,445	884,319	828,227	.94
Butylacrylate-ethyl acrylate copolymers resins-----	19,560	12,776	9,452	.74
Polymethyl methacrylate-----	433,194	317,676	312,090	.98
Thermosetting acrylics-----	55,172	18,811	24,197	1.29
Other acrylics-----	592,519	535,056	482,488	.90
Engineering plastics <sup>11</sup> -----	421,739	359,578	558,887	1.55
Fluorocarbon resins-----	34,870	31,488	200,970	6.38
Petroleum hydrocarbon resins-----	272,449	259,341	125,679	.48
Polyamide resins, total-----	339,219	274,156	407,233	1.49
Nylon type <sup>11, 12</sup> -----	290,223	227,445	358,193	1.57
Non-nylon type-----	48,996	46,711	49,040	1.05

See footnotes at end of table.

TABLE 1.--PLASTICS AND RESIN MATERIALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

PLASTICS AND RESIN MATERIALS	PRODUCTION		SALES	
	QUANTITY	VALUE	QUANTITY	UNIT VALUE <sup>1</sup>
THERMOPLASTIC RESINS--Continued	1,000 pounds dry basis <sup>2</sup>	1,000 pounds dry basis <sup>2</sup>	1,000 dollars	Per pound
Polyester resins, saturated, total <sup>10, 13</sup>	730,039	...	...	...
Polyethylene terephthalate (PET)	625,258	...	...	...
Polybutylene terephthalate (PBT) and other polyesters, saturated	104,781	86,581	116,841	\$1.35
Polyethylene resins, total	12,603,650	12,279,078	3,974,538	0.32
Specific gravity 0.940 and below	7,695,864	6,273,709	2,416,044	.39
Specific gravity over 0.940	4,907,786	6,005,369	1,558,494	.26
Polypropylene resins	4,007,759	3,534,662	1,335,607	.38
Polyterpene resins	35,919	35,485	27,532	.78
Rosin modifications, total	275,357	266,457	131,411	.49
Modified rosins (unesterified)	139,495	127,102	55,687	.44
Modified rosin esters	106,080	102,936	53,234	.52
Rosin esters, unmodified (Ester guma)	29,782	36,419	22,490	.62
Styrene plastics materials, total	5,915,177	5,369,358	3,037,706	.57
Acrylonitrile-butadiene-styrene terpolymer (ABS) resins	1,018,099	921,931	683,145	.74
Rubber modified polystyrene	1,178,987	1,238,667	566,216	.46
Straight polystyrene <sup>14</sup>	2,325,397	2,014,646	946,805	.47
Styrene-butadiene latexes	585,478	570,296	342,132	.60
All other styrene copolymers	435,766	318,081	253,965	.80
All other styrene latexes	66,782	63,815	35,502	.56
All other styrene plastics materials <sup>15</sup>	304,668	241,922	209,941	.87
Vinyl resins, total <sup>16</sup>	6,962,135	6,144,620	2,173,868	.35
Polyvinyl acetate <sup>17</sup>	636,409	582,027	282,741	.49
Polyvinyl alcohol <sup>18</sup>	...	133,250	122,618	.92
Polyvinyl chloride and copolymers	5,618,365	4,982,558	1,463,182	.29
Polyvinylidene chloride latex resins	25,754	25,052	18,945	.76
Vinyl acetate-acrylate copolymers	253,109	...	...	...
Other vinyl and vinylidene resins <sup>19</sup>	428,498	421,733	286,382	.68
All other thermoplastic resins <sup>20</sup>	606,782	806,360	759,018	.94

<sup>1</sup>Calculated from unrounded figures.

<sup>2</sup>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.

<sup>3</sup>Includes benzenoid plastics and resin materials as defined in part 1 of schedule 4 of the Tariff Schedules of the United States (TSUS); also includes urethane type elastomers which are not defined in part 1 of schedule 4 of the TSUS.

<sup>4</sup>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.

<sup>5</sup>Data shown for advanced epoxy resins are that part of the unmodified epoxy resins which is further processed; therefore, the totals in parentheses are not included in the grand total.

<sup>6</sup>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.

<sup>7</sup>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.

<sup>8</sup>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.

<sup>9</sup>Includes acetone-formaldehyde resins, alkyl resins, polybutadiene resins, thiourea resins, and certain other thermosetting resins.

<sup>10</sup>Does not include production or sales for fiber use.

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

*Footnotes--Continued*

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

<sup>13</sup>Statistics are included here for polyethylene terephthalate used in plastics applications (e.g., molding, etc.). Statistics also are included here for production only when the starting materials are converted directly to a finished product (i.e., "in-situ" production), polyester film and tape are examples of such a conversion.

<sup>14</sup>Includes expandable polystyrene beads (EPS).

<sup>15</sup>Includes data for styrene-acrylonitrile copolymer (SAN) resins,  $\alpha$ -methyl styrene polymers, methyl methacrylate-butadiene-styrene (MBS) resins, styrene-divinylbenzene copolymer resins, styrene-maleic anhydride copolymer resins, and styrene-methyl methacrylate copolymer resins.

<sup>16</sup>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.

<sup>17</sup>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.

<sup>18</sup>Production and sales do not include polyvinyl alcohol used as a reactive intermediate for polyvinyl butyral or other vinyl resins.

<sup>19</sup>Includes polyvinyl alcohol production.

<sup>20</sup>Includes cellulose plastics, coumarone-indene resins, polybutylene type resins, polyethylene terephthalate (PET) resins (sales only), polyphenyl aromatic ester resins, and other thermoplastic materials.

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

TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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]

	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
PLASTICS AND RESIN MATERIALS	
THERMOSETTING RESINS	
Acetone-formaldehyde resins--	ACY, AMR, BRU, GP.
*ALKYD RESINS:	
*Acrylate-alkyd copolymer resins--	DSO, FRE, MNP, OBC, SCM.
*Phthalic anhydride type alkyd resins--	ACO, APT, ASH, AZS, BAK, BAL, BEN, BLC, CGL, CJO, CPV, CRC, DEG, DRC, DSO, EM, FCD, FJI, FOC, FRE, GEI, GRV, HAN, ICF, JOB, JSC, KMP, KPT, LIC, MCC, MID, MNP, NCP, OBC, PER, PPG, PRT, RCI, REL, RH, SCM, SCN, SDH, SKT, SM, STT, SW, USS, X.
*polybasic acid type alkyd resins--	ACY, BEN, CEL, CJO, DEG, DSO, DUP, EM, FJI, FOC, FRE, GEI, GRV, HAN, ICF, MCC, PPG, RCI, REL, SCH, SCH, SKT, SM, STT, SW.
*Styrenated-alkyds, or copolymer alkyds--	ACY, CJO, CPU, DSO, EM, FRE, GEI, GRV, HAN, KPT, MCC, HRT, OBC, REL, SCH, SKT, SM, STT, SW.
*vinyl toluene alkyds--	BLC, CGL, CBD, FJI, FRE, GEI, JOB, MCC, MNP, OBC, PPG, PRT, REL, SCH, STT, SW.
*alkyd copolymers, all other--	CGL, DEG, DRC, DSO, DUP, GEI, JOB, LIC, MCC, MNP, PPG, PRT, SW, X.
AMINO RESINS:	
*Melamine-formaldehyde resins--	ACY, AMR, AUX, BOR, CBD, CEL, CGL, CPV, DGO, DRC, GP, GRV, HAN, JSC, KPT, LIC, MID, MRP, MON, OCF, PKF, PLS, PMC, PPG, PPL, PST, RCI, REL, SH, SNM, STC, WPG, WRD.
Thiourea resins--	CHP.
*Urea-formaldehyde resins--	ACY, AMR, APX, ASH, AUX, BAS, BOR, CBD, CBM, CEL, CGL, CHP, CPV, DAN, DSO, GAF, GOC, GP, GRV, HNC, JSC, MMM, MNP, MON, NCJ, NTC, PC, PKF, PMC, PPG, PPL, PST, RCI, REL, SAC, SH, SNM, SOR, SW, USM, USO, VAL, VPC, X, X.
Amino resins, all other--	BAK, RTC.
*Dicyandiamide resins--	APX, CNP, ECC, JSC, S, STC, VPC.
*EPOXY RESINS:	
*Epoxy resins advanced--	ASH, AZS, BEN, CEL, CGL, CGY, CJO, CNI, DSO, EM, GE, GRV, ICF, ISH, LIC, MCC, MID, MMM, MNP, MRT, OCF, PPG, RCI, SCH, SCN, SH, STT, SW, WJX.
*Epoxy resins unmodified--	ADC, CEL, CGY, DA, DOM, ICF, JOB, PPG, PRT, RCI, SCH, SW, UCC, X.

TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1961--CONTINUED

PLASTICS AND RESIN MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
THERMOSETTING RESINS--CONTINUED	
*Furfuryl type resins	ACR, CRC, HVG, IMC, MCP, STC, UNO, WRD.
*Glyoxal-formaldehyde resins	AUX, CNP, OCP, STC, USM, USO, WPG.
*Phenolic and other tar acid resins	ABS, ACR, AMR, ASH, BAK, BME, BOP, BSC, CBD, CBM, CLK, CLU, DA, DSO, EM, FAR, FOM, GE, GEI, GOC, GP, GRG, HER, HKD, HPC, HVG, TCF, IMC, INI, IZ, KPI, MCA, MID, MMH, MON, MCI, NCJ, NCP, OBC, OCF, PAL, PLS, PPG, PPL, PSL, PYZ, RAB, RCI, RGC, SCN, SIM, SKI, SPB, STC, SW, UCC, USR, VPC, VSV, WCA, WRD, X.
polybutadiene resins	ATR, CCS, CNI, LC.
*POLYESTER RESINS, UNSATURATED, AND ALLYL RESINS:	
Allyl resins	FPP, GEI, PPG, SNW.
Diallyl isophthalate	FPP, GEI.
Polyester resins, unsaturated	ACY, ADC, AFP, APH, ASH, AZS, BLC, CGL, CPV, DOM, DSO, EM, FCD, FVI, FHP, FRE, GEI, GRG, GRV, ICI, IPC, KPI, LIC, MCC, MRT, OBC, OCF, PKP, PPG, PPL, RCI, RH, SCM, SCN, SDH, SIC, SLC, SM, SW, UCC, USS, ARK, BAS, CHC, CJO, CPV, DOM, FRE, GAF, HKP, ICI, INP, LIC, MMH, MOB, MRT, NTL, OCF, OMC, PPG, RCI, SKI, TX, UCC, UNO, UPJ, WTC.
*Polyether and polyester polyols for urethanes	
*POLYURETHANE ELASTOMER AND PLASTIC PRODUCTS:	
*Polyurethane elastomers	ACY, ADC, ARO, ASH, BAS, BFG, CNI, CHN, CXI, DA, DCC, DNS, DUP, EEP, EPI, FRE, GRD, HKP, HXL, ICF, INP, MMH, MOB, MON, MRT, PLN, PPG, PRC, SBC, SLC, TKL, UPJ, USR, WTC.
*Polyurethane resins	BAS, CGL, CPV, DSO, DUP, EM, GEI, HYG, INP, JOB, MCC, SM, UPJ, USM, WTC.
*Silicone resins	MID, NTL, OMC, PEL, PTC, PVI, QUN, RCI, SCM, SCH, SW, UPJ, USM, WTC.
Thermosetting resins, all other	CJO, DCC, LIC, MCC, MID, PFL, RCI, SCM, SM, SPD, USO. ACR, ACY, APX, BAK, BAS, CPV, DEG, DSO, FRE, LC, MCC, MOB, PPO, REL, S, SCM, SW, SYT, UCC, VAL, WPG.
THERMOPLASTIC RESINS	
ACRYLIC RESINS:	
COPOLYMER RESINS OF ACRYLIC AND/OR METHACRYLIC ACID RESINS:	
*Butyl acrylate ethyl acrylate copolymer resins	DBB, DSO, QUN, RH, VAL.
*2-Ethylhexyl acrylate-methyl acrylate copolymer resins	DSO.





TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PLASTICS AND RESIN MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
THERMOPLASTIC RESINS--CONTINUED	
POLYESTER RESINS, SATURATED--CONTINUED	
Polyester resins, saturated, all other	DGO, DUP, EKT, NYC, ICF, ICI, MNP, REL, SCH.
POLYETHYLENE AND COPOLYMERS RESINS:	
Ethylene-vinyl acetate (EVA) copolymer resins	AFP, ATR, CBN, CPX, DOM, DUP, EKX, ELP, ENJ, GOC, NRP,
*Specific gravity 0.940 and below	SH, SNM, UCC, USI, X.
*Specific gravity 0.940 and below	PLC, SN.
*Specific gravity over 0.940	AFP, AHO, ATR, CBN, CPX, DOM, DUP, GOC, HPC, MON, PLC,
Polyphenyl aromatic ester resins	HPC.
Polypropylene polymer and copolymer resins	SLT, UCC, USI.
*Polyterpene resins	AMO, ATR, EKK, ELP, ENJ, GOC, HPC, MNP, PLC, SHC, SIT,
*ROSIN MODIFICATIONS:	USO, ARZ, CBY, HPC, RCI, SCN.
*Modified rosin (Unesterified)	ARZ, CJO, CRC, DPP, HPC, NCI, SYL, ZGL.
*Modified rosin esters	BAK, CBY, DPP, EM, FCD, FJI, FRP, GRV, HPC, MCC, NCI,
*Rosin esters, unmodified (Ester gums)	RCI, SCH, SDH, SKT, STC, SM, ZGL.
*STYRENE TYPE PLASTICS MATERIALS:	ARZ, CBY, FRP, HPC, NCI, RCI, SKT.
*Acrylonitrile-butadiene-styrene (ABS) Terpolymer resins	CSD, DOM, GOR, GRD, GYR, MCB, MOM, SM, USS.
α-Methyl styrene polymers	AMO, JNS.
Styrene-acrylonitrile copolymer resins (SAN)	BAS, BFG, CSD, DOM, MON, SKT, SM.
POLYSTYRENE:	
Expandable polystyrene beads	TXS.
*Rubber modified polystyrene	ATR, DOM, GOC, GOR, MON, PLR, SHC, SM, USS.
*Straight polystyrene	AEP, AHO, ATR, BAS, CSD, DOM, GAF, GVC, GOR, HGC, HST,
*STYRENE LATEXES:	JSC, NHH, MON, PLR, SHC, SM, TXS, USS.
*styrene-butadiene latexes	DOM, GNT, GRD, GYR, PLR, UOC, USS.
*All other styrene latexes	ADC, CRC, DOM, DSO, GNT, GRD, HKP, MON, PLR, PVI, UCC,
	UCC, USS.
OTHER STYRENE COPOLYMERS:	
Methyl methacrylate-butadiene styrene (MBS) resins	CYR, MCB.
Styrene-divinylbenzene copolymer resins	RH.
Styrene-maleic anhydride copolymer resins	RR.
Styrene-methyl methacrylate copolymer resins	ACD.
*Styrene copolymers, all other	RCB, BFG, DA, DOM, DSO, DUP, GRD, GYR, HPC, IOC, JNS,
	MON, MRT, PLC, RCB, RCI.



TABLE 2.--PLASTICS AND RESIN MATERIALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PLASTICS AND RESIN MATERIALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
THERMOPLASTIC RESINS--CONTINUED	
VINYL RESINS:	
Polyvinyl acetate resins	: AIP, AZS, BAL, BLS, BOR, CEL, CRC, DAN, DSO, FJL, FLH, : FLN, GLC, GRD, JOB, JSC, KMP, MCC, MON, NSC, RCI, : SCM, SCO, UCC, UOC, X.
Polyvinyl alcohol resins	: AIP, DUP, MON.
Polyvinyl butyral resins	: CMT, DUP, MON.
Polyvinyl formal resin	: EM, MON, SCM.
Vinyl acetate-acrylate copolymers	: ACO, FLA, NCJ, OBC, SCM, SPC, UCC, UOC.
POLYVINYL CHLORIDE AND COPOLYMER RESINS:	
Polyvinyl chloride copolymer resins	: GNT, HKP, HM, SFP.
Polyvinyl chloride homopolymer resins	: AIP, BFG, BOR, CMT, CO, DA, GNT, GP, GRA, HKP, HN, : KYS, PNI, RCO, SFP, SHT, TNA, TRA, UCC.
POLYVINYLIDENE CHLORIDE RESINS:	
Latex types polyvinylidene chloride resins	: BFG, DOM, GRD, HRT, UOC, USS.
Vinyl resins all other	: CEL, DOM, DSO, DUP, RH, SCH, UCC.
Thermoplastic resins, all other	: ARA, EKX, MON, MHI, PFG, SW, X.

TABLE 3.--PLASTICS AND RESIN MATERIALS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of plastics and resin materials to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ABS	: Abex Corp., Friction Products Group	CPX	: Chemplex Co.
ACR	: CPC International, Inc., Acme Resin Corp.	CRC	: California Resin & Chemical Co., Inc.
ACO	: Adco Chemical Co.	CSD	: Cosden Oil & Chemical Co.
ACY	: American Cyanamid Co.	CTP	: Continental Polymers, Inc.
ADC	: Anderson Development Co.	CTR	: Custom Resins Div. of Bemis Co., Inc.
AEP	: A & E Plastik Pak Co., Inc., A & E Plastics	CWN	: Upjohn Co., Fine Chemical Div.
AFP	: Allied Corp., Fibers & Plastics Co. Div.	CYR	: CYRO Industries, Inc.
AMO	: Standard Oil Co. (Indiana)	CXI	: Chemical Exchange Industries, Inc.
AMR	: Pacific Resins & Chemical, Inc.		
APH	: The Alpha Corp.	DA	: Diamond Shamrock Corp.
APT	: Whittaker Corp., Whittaker Coatings & Chemicals, Mol Rez Resins	DAN	: Dan River, Inc., Chemical Products Div.
APX	: Apex Chemical Co., Inc.	DCC	: Dow Corning Corp.
ARA	: Araphoe Chemicals, Inc., Sub/Syntex U.S.A., Inc.	DEG	: Degan Oil & Chemical Co.
ARK	: Armstrong World Industries, Inc.	DGO	: Day-Glo Color Corp.
ARO	: Aruco	DNS	: Dennis Chemical Co.
ARZ	: Arizona Chemical Co.	DOW	: Dow Chemical Co.
ASH	: Ashland Oil, Inc.	DPP	: Dixie Pine Chemicals, Inc.
ATR	: Atlantic Richfield Co., Arco Chemical Co.	DRB	: The Derby Co., Inc.
AUX	: Auralux Corp.	DRC	: Dock Resins Corp.
AZS	: AZS Corp.	DSO	: DeSoto, Inc.
	: AZ Products Co. Div.	DUP	: E.I. duPont de Nemours & Co., Inc.
	: AZS Chemical Co. Div.		
BAK	: Baker International - Magna Corp.	ECC	: Eastern Color & Chemical Co.
BAL	: Dutch Boy, Inc., Consumers Group, Sherwin-Williams Co.	EEP	: Eaton Corp., EEP Div.
BAS	: BASF Wyandotte Corp.	EPH	: E.F. Houghton & Co.
BCH	: Belding Cortecelli Industries	EK	: Eastman Kodak Co.
BEN	: Bennett's	EKT	: Tennessee Eastman Co. Div.
BFG	: B.F. Goodrich Co., B.F. Goodrich Chemical Group	EKK	: Texas Eastman Co. Div.
BLC	: Ball Chemical Co.	ELP	: El Paso Polyoilfins Co.
BLS	: Life Savers, Inc.	EMR	: Emery Industries, Inc.
BME	: Bendix Corp., FM Div.	ENJ	: Exxon Chemical Co. Americas
BOR	: Borden Co., Borden Chemical Co. Div.	EPI	: Eagle Pitcher Industries, Inc., Ohio Rubber Co. Div.
BRU	: M.A. Bruder & Sons, Inc.	EW	: Westinghouse Electric Corp., Insulating Materials Div.
BSC	: Brand-S Corp.		
CBD	: Chembond Corp.	FAR	: Syncon Resins, Inc.
CBM	: Kennecott Corp.	FCD	: Synres Chemical Corp.
CBN	: Cities Service Co., Petrochemical Div.	FJI	: Foy-Johnson, Inc.
CBY	: Crosby Chemicals, Inc.	FLH	: H.B. Fuller Co.
CCS	: Colorado Chemical Specialties, Inc.	FLN	: Franklin Chemical Industries
CEL	: Celanese Corp., Celanese Plastics & Specialties Co.	FMP	: FMC Corp., Industrial Chemical Div.
CGL	: Cargill, Inc.	FOC	: Handschy Industries, Inc., Farac Oil & Chemical Co. Div.
CGY	: Ciba-Geigy Corp., Resins Dept.	FOM	: Formica Corp., Sub. of American Cyanamid Co.
CHC	: Carpenter Chemical Co.	FRE	: Freeman Chemical Corp.
CHP	: C.H. Patrick & Co., Inc.	FRF	: Firestone Tire & Rubber Co., Firestone Fibers & Textile Co.
CJO	: C. J. Osborn Chemicals, Inc.	FRP	: FRP Company
CLK	: Clark Oil & Refining Corp.		
CLU	: Core-Lube, Inc.	GAF	: GAF Corp.
CMP	: Commercial Products Co., Inc.	GE	: General Electric Co.:
CNI	: Frye Copysystems, Conap Div.	GEI	: Laminated & Insulating Materials Business Dept.
CNT	: Certainteed Corp.	GLC	: General Latex & Chemical Corp.
CO	: Conoco, Inc.	GNT	: General Tire & Rubber Co., Chemical Div.
COO	: The Terrell Corp.	GOC	: Gulf Oil Corp., Gulf Oil Chemicals Co.-U.S.
CPV	: Cook Paint & Varnish Co.	GOR	: Carl Gordon Industries, Inc.
		GP	: Georgia-Pacific Corp.:
			: Plaquemine Div.
			: Resins Operations

TABLE 3.--PLASTICS AND RESIN MATERIALS: DIRECTORY OF MANUFACTURERS, 1981--CONTINUED

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
GRA	Great American Chemical Corp.	ORC	O'Brien Corp.
GRD	W.R. Grace & Co., Polymers & Chemicals Div.	OCF	Owens-Corning Fiberglas Corp.
GRC	P.D. George Co.	OMC	Olin Corp.
GRV	Guardsman Chemicals, Inc.		
GYR	Goodyear Tire & Rubber Co.	PAC	Pacific Anchor Chemical Corp.
		PAI	Polymer Applications, Inc.
HAN	Hanna Chemical Coating Corp.	PAS	Pennwalt Corp.
HER	Heresite-Saekaphen, Inc.	PC	Proctor Chemical Co.
HGC	Huntsman Goodsons Chemical Corp.	PDI	Phelps Dodge Industries, Inc., Phelps Dodge Magnet Wire Co. Div.
	Hooker Chemicals Corp.:	PEL	Peltron Corp.
	Hooker Chemicals & Plastics Corp.:	PER	Perry & Derrick Co., Inc.
HKD	Durez Div.	PKL	Plaskolite, Inc.
HKP	PVC Div.	PKP	Plaskon Products, Inc.
HN	Tenneco Chemicals, Inc.	PLC	Phillips Petroleum Co.
HNC	H & N Chemical Co.	PLN	Disogrin Industries Corp.
HPC	Hercules, Inc.	PLR	Polysar, Inc.:
HST	American Hoechst Corp., Petrochemical Div.		Latex Div.
HVG	Ametek, Inc., Havg Div.		Polysar Latex Div.
HXL	Hexcel Corp., Hexcel Products	PLS	Plastics Engineering Co.
HYC	Dexter Corp., Hysol Div.	PMC	Plastics Manufacturing Co.
		PNT	Pantasote, Inc., Film/Compound Div.
ICF	Inmont Corp.	PPG	PPG Industries, Inc.
ICI	ICI Americas, Inc. and Chemical Specialties Co.	PPL	Pioneer Plastics Div. of LOP Plastics, Inc.
INL	Inland Steel Co., Island Steel Container Co. Div.	PRC	Products Research & Chemical Corp.
INP	Synsair Corp.	PRT	Pratt & Lambert, Inc.
IOC	Sybron Corp., Sybron Chemical Div.	PSL	Plaslok Corp.
IPC	Interplastic Corp.	PST	Perstorp, Inc.
IRI	Ironsides Co.	PTC	Polycast Technology Corp.
ISM	Isochem Resins Co.	PVI	Polyvinyl Chemical Industries
		PYZ	Polyrez Co., Inc.
JNS	S.C. Johnson & Son, Inc.	QCP	Quaker Chemical Corp.
JOB	Jones-Blair Co.	QUN	K.J. Quinn & Co., Inc.
JSC	Sybron Corp., Sybron Chemical Div.		
		RAB	Raybestos Manhattan, Industrial Div.
KMP	Kelly-Moore Paint Co., Inc.	RAS	Raffi and Swanson, Inc.
KPT	Koppers Co., Inc.	RGD	Richardson Co., Polymeric Systems Div.
KYS	Keysor Corp.	RCI	Reichhold Chemicals Inc.
		ROO	Rico Chemical Corp.
LC	Lord Corp., Chemicals Products Group	REL	Reliance Universal, Inc., Louisville Resins Operations
LIC	Lilly Industrial Coatings, Inc.	RGD	Rogers Corp., Molding Materials Div.
		RH	Rohm & Haas Co.
MCA	Masonite Corp., Alpine Div.	RSN	Rilsan Corp.
MCB	Borg-Warner Corp., Borg-Warner Chemicals	RTC	Riegel Textile Corp., H.I.T. Chemicals Div.
MCC	McCloskey Varnish Co.		
MCC	McCloskey Varnish Co. of Northwest	S	Sandoz, Inc., Colors & Chemicals Div.
MCC	McCloskey Varnish Co. of the West	SAC	Southeastern Adhesives Co.
MID	Dexter Corp., Midland Div.	SAR	Leski, Inc.
MMM	Minnesota Mining & Manufacturing Co.	SCM	SCM Corp., Gliddem Coatings & Resins Div.
MNP	The Valspar Corp.	SCN	Schenectady Chemicals, Inc.
MOB	Mobay Chemical Co., Pittsburgh Div.	SCO	Scholler, Inc.
MON	Monsanto Corp.	SCP	Henkel Corp.
MRT	Morton Norwich Products, Inc., Morton Chemical Co. Div.	SDH	Sterling Drug, Inc., Hilton Davis Chemical Co. Div.
		SFP	Stauffer Chemical Co., Plastics Div.
NCI	Union Camp Corp., Chemical Products Div.	SHC	Shell Oil Co., Shell Chemical Co. Div.
NCJ	National Casein of New Jersey	SHT	Shintech, Inc.
NCP	Niles Chemical Paint Co. and Kordell Industries Div.	SIC	Vistron Corp., Silmar Div.
NEV	Neville Chemical Co.	SIM	Simpson Timber Co., Oregon Overlay Div.
NSC	National Starch & Chemical Corp.	SKT	Textron Inc., Spencer Kellogg Div.
NTC	National Casein Co.	SLC	Soluol Chem Co., Inc.
NTL	NL Industries, Inc.	SLT	Soltex Polymer Corp.
NWP	Northern Petrochemical Co.		

TABLE 3.--PLASTICS AND RESIN MATERIALS: DIRECTORY OF MANUFACTURERS, 1981--CONTINUED

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
SM	Mobil Oil Corp.:	UPJ	Upjohn Co.
:	Mobil Chemical Co.:	USI	National Distillers & Chemical Corp.:
:	Chemical Coatings Div.	:	U.S. Industrial Chemicals Co.:
:	Petrochemical Div.	:	National Petro Chemical Corp.
SNW	Sun Chemical Corp., Chemicals Div.	USM	Crown Metro, Inc.
SOR	MW Manufacturers, Southern Resin Div.	USM	Emhart Corp., Bostik Div.
SPC	Insilco Corp., Sinclair Paint Co. Div.	USO	U.S. Oil Co.
SPD	General Electric Co., Silicone Products Dept.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SPL	Spaulding Fibre Co., Inc., Industrial Plastics	USS	USS Chemicals Div., U.S. Steel Corp.
:	Div.	VAL	Valchem Div. of United Merchants &
STC	American Hoechst Corp., Sou-Tex Works	:	Manufacturers, Inc.
STT	Standard T Chemical, Inc.	VPC	Mobay Chemical Corp., Dyestuff Div.
SW	Sherwin-Williams Co.	VSV	Valentine Sugars, Inc., Valite Div.
SYL	Sylvachem Corp.	:	:
SYT	Synthron, Inc.	WCA	West Coast Adhesives Co.
:	:	WLN	Wilmington Chemical Corp.
TKL	Thiokol Corp., Specialty Chemicals Div.	WPC	West Point-Pepperill, Inc., Griffitex Chemical
TNA	Ethyl Corp., Polymer Div.	:	Co. Sub.
TRA	Talleryrand Chemicals, Inc.	WRD	Weyerhaeuser Co.
TX	Texaco, Inc.	WTC	Witco Chemical Corp.
TXS	Texstyrene Plastica, Inc.	:	:
:	:	ZGL	Carolina Processing Corp.
UCC	Union Carbide Corp.	:	:
UNO	United-Erie, Inc.	:	:
UOC	Union Oil Co. of California	:	:
:	:	:	:

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 264 reporting companies and company divisions for which permission to publish was not restricted.



## STATISTICAL HIGHLIGHTS

Sharon Kay Thompson

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 pepfizers. Data on production and sales of rubber-processing chemicals in 1981 are given table 1.<sup>1</sup>

Production of rubber-processing chemicals as a group in 1981 amounted to 280 million pounds, or 4.0 percent less than the 291 million pounds in 1980. Sales of rubber-processing chemicals in 1981 amounted to 182 million pounds, valued at \$298 million, compared with 194 million pounds, valued at \$296 million in 1980.

The production of cyclic rubber-processing chemicals in 1981 amounted to 246 million pounds, or 4.7 percent less than the 258 million pounds in 1980. Sales in 1981 were 158 million pounds, valued at \$271 million, compared with 168 million pounds, valued at \$270 million of cyclic rubber-processing chemicals in 1981, accelerators, activators, and vulcanizing agents accounted for 33.6 percent and antioxidants, antiozonants, and stabilizers for 60.6 percent. Production of antioxidants, antiozonants, and stabilizers, which amounted to 149 million pounds in 1981, included 91 million pounds of amino compounds and 58 million pounds of phenolic and phosphite compounds. Sales of amino antioxidants, antiozonants, and stabilizers in 1981 amounted to 61 million pounds, valued at \$105 million; sales of phenolic and phosphite antioxidants, antiozonants, and stabilizers, were 35 million pounds, valued at \$55 million.

Production of acyclic rubber processing chemicals in 1981 amounted to 33 million pounds, or approximately the same amount as reported for 1980. Sales in 1981 totaled 24 million pounds, valued at \$27 million, compared with 26 million pounds, valued at \$26 million, in 1980. Dithiocarbamic acid derivatives accounted for 28.1 percent of sales (based on quantity) of acyclic rubber-processing chemicals in 1981.

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





TABLE 1.--RUBBER-PROCESSING CHEMICALS: U.S. PRODUCTION AND SALES, 1981

[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	SALES			
	PRODUCTION	UNIT VALUE <sup>1</sup>		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total-----	279,628	181,540	298,353	\$1.64
CYCLIC				
Total-----	246,268	157,591	270,934	1.72
Accelerators, activators, and vulcanizing agents,				
total-----	82,702	48,286	80,638	1.67
Aldehyde-amine reaction products-----	712	799	1,958	2.45
Thiazole derivatives, total-----	74,764	41,386	61,239	1.48
2,2'-Dithiobis(benzothiazole)-----	12,152	7,621	8,938	1.17
2-Mercaptobenzothiazole-----	2,328	2,495	2,825	1.13
2-Mercaptobenzothiazole, zinc salt-----	1,581	1,547	2,045	1.33
All other thiazole derivatives-----	58,703	29,723	47,431	1.60
All other accelerators, activators, and vulcanizing agents <sup>2 3</sup> -----	7,226	6,101	17,441	2.86
Antioxidants, antiozonants, and stabilizers, total----				
total-----	149,225	95,397	159,760	1.67
Amino compounds, total-----	90,890	60,699	105,131	1.73
Substituted p-phenylenediamines, total-----	61,930	32,617	66,081	2.03
N',N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine-----	5,155	4,668	9,007	1.93
Other substituted p-phenylenediamines-----	56,775	27,949	57,074	2.04
All other amino compounds <sup>4</sup> -----	28,960	28,082	39,050	1.39
Phenolic and phosphite compounds, total-----	58,335	34,698	54,629	1.57
Nonylphenyl phosphite, mixed-----	15,639	10,174	7,595	.75
Phenolic compounds:				
Polyphenolics (including bisphenols)-----	9,367	8,266	27,455	3.32
Phenol, alkylated-----	6,179	2,974	5,750	1.93
Phenol, styrenated-----	1,009	834	857	1.03
All other phenolic and phosphite compounds-----	26,141	12,450	12,972	1.04
All other cyclic rubber-processing chemicals <sup>5</sup> -----	14,341	13,908	30,536	2.20
ACYCLIC				
Total-----	33,360	23,949	27,419	1.14
Dithiocarbamic acid derivatives, total <sup>3</sup> -----				
total-----	9,955	6,726	11,561	1.72
Dimethyldithiocarbamic acid, zinc salt-----	1,880	1,779	2,471	1.39
All other dithiocarbamic acid derivatives-----	8,075	4,947	9,090	1.84
Thiurams, xanthates and sulfides-----				
total-----	2,531	2,406	4,107	1.71
All other acyclic rubber-processing chemicals <sup>6</sup> -----	20,874	14,817	11,751	.79

<sup>1</sup>Calculated from unrounded figures.

<sup>2</sup>Includes guanidines, dithiocarbamates, and other uses not separately shown.

<sup>3</sup>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 on "Pesticides and Related Products."

<sup>4</sup>Includes aldehyde- and acetone-amine reactions products.

<sup>5</sup>Includes blowing agents, peptizers, and other uses not separately shown.

<sup>6</sup>Includes "other" 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 REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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.]

RUBBER-PROCESSING CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC	
*ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS:	
*ALDEHYDE-IMINE REACTION PRODUCTS:	
Bis(cinnamylidene)hexamethylenediamine	: DUP.
n-butylaldehyde-aniline condensate	: DUP, RCD.
Heptaldehyde-aniline condensate	: USR.
Triethylmethylenetriamine	: USR.
Aldehyde-amine reaction products, cyclic, other:	: RBC.
DITHIOCARBAMIC ACID DERIVATIVES:	
Dibenzylidithiocarbamic acid, sodium salt	: USR.
Dibenzylidithiocarbamic acid, zinc salt	: USR.
Dibutylidithiocarbamic acid, N,N-	
dimethylcyclohexylamine salt	: RBC.
Piperidinecarbodiithioic acid, piperidinium	
potassium salts, mixed	: DUP.
GUANAMINES:	
Dicacetyl borate, di-o-tolylguanidine salt	: DUP.
1,3-Diphenylguanidine	: ACY.
1,3-Di-o-tolylguanidine	: ACY.
*THIAZOLE DERIVATIVES:	
1,3-Bis(2-benzothiazolylmercaptomethyl) urea	: MON, RBC.
N-tert-butyl-2-benzothiazolesulfonamide	: BFG, USR.
N-cyclohexyl-2-benzothiazolesulfenamide	: ACY, MON, USR.
N,N-diisopropyl-2-benzothiazolesulfenamide	: ACY.
*2,2'-Dithiobis(2-benzothiazole)	: ACY, BFG, GYR, MON, USR.
2-Mercaptobenzothiazole	: ACY, GYR, USR.
2-Mercaptobenzothiazole, copper salt	: ACY, MON.
2-Mercaptobenzothiazole, zinc chloride	: DUP.
*2-Mercaptobenzothiazole, zinc salt	: ACY, GYR, USR.
4-Morpholinyl 2-benzothiazyl disulfide	: GYR.
N-Oxydiethylene-2-benzothiazolesulfenamide	: ACY, BFG, USR.
Thiazole derivatives, cyclic, other:	: USR, VNC.
*ALL OTHER CYCLIC ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS:	
Bis(morpholinothiocarbonyl) disulfide	: ACY.
Dibenzylamine	: HXL, USR.

TABLE 2.--RUBBER-PROCESSING CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

RUBBER-PROCESSING CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS--CONTINUED	
ALL OTHER CYCLIC ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS--CONTINUED	
Di-N,N'-pentamethylenethuram tetrasulfide	VNC
4,4'-Dithiodimorpholine	MON
m-Phenylenediamine	DUP
Tetramethylthuram disulfide	DUP
Tetramethylthuram tetrasulfide	GFR
Accelerators, activators, and vulcanizing agents, cyclic, other	DUP, RBC
*ANTIOXIDANTS, ANTI-OZONANTS, AND STABILIZERS:	
*AMINO ANTI-OXIDANTS, ANTI-OZONANTS, AND STABILIZERS:	
ALDEHYDE AND ACETONE-AMINE REACTION PRODUCTS:	
Butyraldehyde-aniline condensate	DUP
Diphenylamine-acetone aldehyde	USR
Diphenylamine-acetone condensate	BFG, USR
*SUBSTITUTED P-PHENYLENEDIAMINES:	
Alkylaryl-p-phenylamine-diamines	MON
*N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	MON, UPM, USR
N,N'-Bis(1-ethyl-3-methylpentyl)-p-phenylenediamine	UPM
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	UPM
N-Cyclohexyl-N'-phenyl-p-phenylenediamine	USR
Diarylenediamines, mixed	GYR
N,N-Dicyclohexyl-p-phenylenediamine	UPM
N-(1,3-Dimethylbutyl)-N-phenyl-p-phenylenediamine	GYR, UPM, USR
N,N-Di-2-naphthyl-p-phenylenediamine	BFG
N,N-Diphenyl-p-phenylenediamine	BFG, USR
N-Isopropyl-N'-phenyl-p-phenylenediamine	USR
N-(1-Methylheptyl)-N'-phenyl-p-phenylenediamine	UPM
N-(1-Methylpentyl)-N'-phenyl-p-phenylenediamine	USR
* OTHER AMINES:	
P-Anilino-phenol	BFG
1,2-Dihydro-6-dodecyl-2,4-trimethylquinoline	MON
1,2-Dihydro-6-ethoxy-2,4,4-trimethylquinoline	MON
1,2-Dihydro-2,4,4-trimethylquinoline	BFG, MON, USR
Diphenylamine-styrenated	GYR
Diphenylamine, substituted	USR
Nonylidiphenylamine mixture (Mono-, di-, and tri-)	USR
Octylidiphenylamine	BFG, USR
Octylidiphenylamine, alkylated	BFG
p-(p-Toluenesulfonamido)diphenylamine	USR

TABLE 2.--RUBBER-PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

RUBBER-PROCESSING CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
ANTIOXIDANTS, ANTI-OZONANTS, AND STABILIZERS--CONTINUED	
*PHENOLIC AND PHOSPHITE ANTI-OXIDANTS AND STABILIZERS:	
PHOSPHITES:	
Alkylaryl phosphites mixed	FER, MCB.
*Monylphenyl phosphites	FER, MCB, OMC, USSR.
Polymeric phosphites	MCB, OMC
Polyphenolic phosphites, polyalkylated	BFG, MCB.
Triaryl phosphites	MCB.
*POLYPHENOLICS (INCLUDING BISPHENOLS):	
Bisphenol, hindered	DUP, GYR, USSR.
4,4'-butylenediols(6-tert-butyl-m-cresol)	MON.
2,5-Di-sec-butyldecylhydroquinone	USR.
2,5-Di-(1,1-dimethylpropyl)hydroquinone	MON.
2,2'-Methylenebis(6-tert-butyl-p-cresol)	ACY.
2,2'-Methylenebis(6-tert-butyl-4-ethylphenol)	ACY.
2,2'-Methylenebis[6-(1-methylcyclohexyl)-p-cresol]	ACY, ICI.
4,4'-thiobis(6-tert-butyl-m-cresol)	MON.
Thiobisphenol, alkylated	USR.
1,1,3-Tri(2-methyl-4-hydroxy-5-tert-butylphenyl)butane	ICI.
ALL OTHER PHENOLIC ANTI-OXIDANTS AND STABILIZERS:	
o-cresol, alkylated	PIT.
*Phenol, alkylated	ACY, BFG, GYR, NEV, RCI.
Phenol, hindered	USR.
*Phenol, styrenated, mixtures	GYR, NEV, USSR.
N-Stearoyl-p-aminophenol	BYL.
BLOWING AGENTS:	
Dinitrosopentamethylenetetramine	OMC.
P,P'-Oxybis(benzene-sulfonhydrazide)	USR.
P-Toluenesulfonyl hydrazide	USR.
P-Toluenesulfonylsemicarbazide	USR.
Blowing agents, cyclic, all other	USR.
PEPILIZERS:	
2,2'-(4-Dithiobis(benzamilde))	ACY.
Dialkyl disulfides, mixed	PIT.
ALL OTHER CYCLIC RUBBER-PROCESSING CHEMICALS:	
P-tert-Amylphenol sulfide (Tackifier)	PAS.
4-Chloro-2,6-bis(2,4-dihydroxybenzyl)phenol	ICI.
N-(Cyclohexylthio)phthalimide	MON.
Diphenyl-4,4'-diphenylmethylenedicarbamate	USR.
N-(2-Methyl-2-nitropropyl)-4-nitrosoaniline	MON.

TABLE 2.--RUBBER-PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

RUBBER-PROCESSING CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
ALL OTHER CYCLIC RUBBER-PROCESSING CHEMICALS--CONTINUED	
Nitrosodiphenylamine (Retarder)	GYR, USR.
Rubber-processing chemicals, acyclic, all other	VNC
Waxes and paraffinic products	DUP, RCI.
Zinc laurate (Activator, physical property improver and processing auxiliary)	USR.
Rubber processing chemicals, cyclic, all other	ACY, KPI.
ACYCLIC	
ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS:	
*DITHIOCARBAMIC ACID DERIVATIVES:	
Diethylthiocarbamic acid, nickel salt	DUP, USR, VNC.
Diethylthiocarbamic acid, sodium salt	DUP, USR, VNC.
Diethylthiocarbamic acid, zinc salt	RBC, VNC.
Diethylthiocarbamic acid, cadmium salt and bis(diethylthiocarbamoyl)disulfide, mixture	VNC.
Diethylthiocarbamic acid, selenium salt	VNC.
Diethylthiocarbamic acid, sodium salt	ALC, EK, VNC.
Diethylthiocarbamic acid, tellurium salt	VNC.
Diethylthiocarbamic acid, zinc salt	ALC, GYR.
Dimethylthiocarbamic acid, bismuth salt	VNC.
Dimethylthiocarbamic acid, copper salt	VNC.
Dimethylthiocarbamic acid, lead salt	VNC.
Dimethylthiocarbamic acid, selenium salt	VNC.
Dimethylthiocarbamic acid, sodium salt and sodium polysulfide	BFG.
*Dimethylthiocarbamic acid, zinc salt	ALC, FMN, GYR, USR, VNC.
THIURAMS:	
Bis(diethylthiocarbamoyl)disulfide	GYR.
Bis(dimethylthiocarbamoyl) disulfide	GYR, VNC.
Bis(dimethylthiocarbamoyl) sulfide	GYR, USR.
N,N'-diocetadecyl-N,N'-diisopropyl thiuram disulfide	USR.
XANTHATES AND SULFIDES:	
Di-n-butylxantho disulfide	USR.
Diisopropylxantho disulfide	BFG.
Zinc diisopropyl xanthate	VNC.
ALL OTHER ACYCLIC ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS:	
P-Aminocyclohexylmethane carbonate	DUP.
n-Butylaldehyde-butylamine condensate	DUP.
Ethylenediamine carbamate	DUP.

TABLE 2.--RUBBER-PROCESSING CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
RUBBER-PROCESSING CHEMICALS	
ACYCLIC--CONTINUED	
ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS--CONTINUED	
ALL OTHER ACYCLIC ACCELERATORS, ACTIVATORS, AND VULCANIZING AGENTS--CONTINUED	
Methacrylic acid, zinc salt--	USR.
Accelerators, activators, and vulcanizing agents, acyclic, other--	RBC, VNC.
CONDITIONING AND LUBRICATING AGENTS:	
Mono- and dialkyl phosphate ammonium salts, mixed--	DUP.
Sodium alkyl sulfates--	DUP.
POLYMERIZATION REGULATORS:	
Alkyl mercaptans, mixed--	PLC.
n Dodecyl mercaptans--	PAS, PLC.
tert-Hexadecyl mercaptan--	PLC.
N-Hexyl mercaptan--	PLC.
tert-Nonyl mercaptan--	PAS, PLC.
n-Octyl mercaptan--	PLC.
tert-Octyl mercaptan--	PAS, PLC.
Tetradecyl mercaptan--	PLC.
SHORTSTOPS:	
Dimethyldithiocarbamic acid, potassium salt--	USR.
Dimethyldithiocarbamic acid, sodium salt--	AIC, USR, VNC.
ALL OTHER ACYCLIC RUBBER-PROCESSING CHEMICALS:	
Alkyl alcohols, mixed--	DUP.
3, 7-Dioctylphenothiazine--	USR.

TABLE 3.--RUBBER-PROCESSING CHEMICALS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of rubber-processing chemicals to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ACY	American Cyanamid Co.	MCB	Borg-Warner Corp., Borg-Warner Chemicals
ALC	Alco Chemical Corp.	MON	Monsanto Co.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group	NEV	Neville Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc.	OMC	Olin Corp.
EK	Eastman Kodak Co.	PAS	Pennwalt Corp.
FER	Ferro Corp., Ferro Chemical Div.	PIT	Pitt-Consol Chemical Co.
FMN	FMC Corp., Agricultural Chemical Div.	PLC	Phillips Petroleum Co.
GYR	Goodyear Tire & Rubber Co.	RBC	Fike Chemicals, Inc.
HXL	Hexcel, Inc., Hexcel Chemical Products	RCD	Richardson Co.
ICI	ICI Americas Inc., Chemical Specialties Co.	RCI	Reichhold Chemicals, Inc.
KPI	Kenrich Petrochemicals, Inc.	UPM	UOP, Inc.
		USR	Uniroyal, Inc., Uniroyal Chemical Div.
		VNC	Vanderbilt Chemical Corp.

Note.--Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 28 reporting companies and company divisions for which permission to publish was not restricted.



## STATISTICAL HIGHLIGHTS

Sharon Kay Thompson

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 1981 are shown in table 1.<sup>1</sup>

Total U.S. production<sup>2</sup> of synthetic rubber in 1981 amounted to 4,849 million pounds, an increase of 1.7 percent from that produced in 1980.<sup>3</sup> Total sales<sup>2</sup> of elastomers in 1981 amounted to 3,256 million pounds, approximately the same as that sold in 1980.<sup>3</sup>

Styrene-butadiene rubber (SBR, or S-type rubber) in 1981 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 21 million pounds of its vinylpyridine sub-type, amounted to 2,268 million pounds in 1981.<sup>4</sup> Solution polymerized butadiene rubber, a stereo type elastomer, was produced domestically in 1981 in the next largest amount--767 million pounds.<sup>4</sup> Other principal types of synthetic elastomers for which U.S. production data are reported separately are ethylene-propylene rubber, production of which was 401 million pounds in 1981; acrylonitrile-butadiene (N-type) rubber, production of which was 127 million pounds; and silicone type elastomers, production of which was 106 million pounds.<sup>4</sup>

Sales of S-type rubber by U.S. producers in 1981 (excluding its vinylpyridine sub-type) amounted to 1,326 million pounds.<sup>4</sup> Sales of solution polymerized butadiene rubber amounted to 418 million pounds, and those of ethylene-propylene rubber to 292 million pounds.<sup>4</sup> Sales of N-type rubber in 1981 amounted to 105 million pounds.<sup>4</sup>

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<sup>1</sup>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.

<sup>2</sup>Does not include urethane type elastomers.

<sup>3</sup>Calculated by using the estimated figures for production and sales in 1980.

<sup>4</sup>Data for 1980 are not available.





TABLE 1.--ELASTOMERS (SYNTHETIC RUBBER):<sup>1</sup> U.S. PRODUCTION AND SALES, 1981

[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 <sup>2</sup>	SALES		
		QUANTITY <sup>2</sup>	VALUE	UNIT VALUE <sup>3</sup>
	1,000	1,000	1,000	Per
	pounds	pounds	dollars	pound
Grand total-----	4,849,457	3,255,832	2,505,096	\$0.77
Cyclic-----	2,487,145	1,552,530	848,554	.55
Acyclic-----	2,362,312	1,703,302	1,656,542	.97
Acrylonitrile-butadiene type (N-type)-----	126,846	105,159	72,280	.69
Ethylene-propylene type-----	400,526	292,238	227,240	.78
Polyacrylate ester type-----	( <sup>4</sup> )	3,679	7,436	2.02
Silicone type-----	106,118	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )
Stereo elastomers: Butadiene (solution polymerized) type-----	766,743	418,277	242,280	.58
Styrene-butadiene type (S-type)-----	2,246,695	1,326,484	631,096	.48
Styrene-butadiene-vinylpyridine type-----	20,845	( <sup>4</sup> )	( <sup>4</sup> )	( <sup>4</sup> )
All other elastomers <sup>5</sup> -----	1,181,684	1,109,995	1,324,764	1.19

<sup>1</sup>The term "elastomers" is defined as substance 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.

<sup>2</sup>Includes oil content of oil-extended elastomers.

<sup>3</sup>Calculated from unrounded figures.

<sup>4</sup>Included in "All other elastomers."

<sup>5</sup>Includes production and/or sales data for acrylic ester, butyl, chloroprene, epichlorohydrin, fluorinated, isobutylene, isoprenes, polysulfide, and silicone-type elastomers, certain solution elastomers, chlorinated rubber, chlorosulfonated polyethylene, thermoplastic rubber, and miscellaneous elastomers.

Note.--Data on production and sales of urethane elastomers are now reported in the section "Plastics and Resin Materials" with urethane plastics and polyols.

TABLE 2.--ELASTOMERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981  
 [CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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.]

ELASTOMERS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC	
BUTADIENE-STYRENE TYPE:	
*Butadiene-styrene (S-Type)	: ASY, BFG, CPY, FRG, GNT, GRD, GYR, MMM, PIC, PFR, USR.
*Butadiene-styrene-vinylpyridine	: BFG, FRG, GNT, GYR.
*Butadiene-styrene-vinylpyridine	: BFG, FRG, GNT, GYR.
Polyester elastomer	: DUP.
Polyisoprene, cyclized	: MAY.
Butadiene-styrene type elastomers, other	: ASY, PIC.
ALL OTHER CYCLIC ELASTOMERS:	
Elastomers, cyclic, all other	: HPC, SHC.
ACYCLIC	
POLYACRYLATE ESTER TYPE:	
*Polyacrylate ester, type elastomers	: ACY, BFG, DUP.
Polyalkalene oxide	: PRC.
POLYALKALENE SULFIDE TYPE:	
Butadiene-acrylic acid-acrylonitrile	: ASY.
Polyalkalene sulfide, type elastomers	: TKL.
BUTADIENE-ACRYLONITRILE TYPE (N-TYPE):	
*Butadiene-acrylonitrile type (N-Type)	: BFG, CPY, GYR, MMM, USR.
POLYBUTADIENE TYPE (EMULSION):	
Polybutadiene type (Emulsion)	: BFG, GYR, TKL.
POLYCHLOROPRENE TYPE (NEOPRENE):	
Epichlorohydrin rubbers	: BFG, HPC.
Fluoroelastomers	: DUP, MMM.
Polychloroprene type (Neoprene)	: DKA, DUP.
Polyethylene, chlorosulfonated	: DUP.
POLYISOBUTYLENE TYPE:	
Polisobutylene, type elastomers	: ENJ.
ISOBUTYLENE-ISOPRENE TYPE (BUTYL):	
Isobutylene-isoprene type (Butyl)	: CBN, ENJ.
PRODUCTS OF NATURAL RUBBER:	
*Polymerized chlorinated rubbers	: HPC, ICI.
SILICONE TYPE:	
*Silicone type elastomers	: DCC, SPD, SMS.
STEREISOIMER TYPE:	
*Ethylene-propylene rubber	: BFG, CPY, DUP, ENJ, USR.
*Polybutadiene (Solution polymerized)	: ASI, BFG, FRG, GNT, GIR, PLC.
*Polyisoprene (Solution polymerized)	: GYR.

TABLE 2.--ELASTOMERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

ELASTOMERS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
STEREoisomer TYPE--CONTINUED	
Stereoisomer type, all other	ADC, USR.
Thermoplastic elastomers, acyclic	ASY.
ALL OTHER ACYCLIC ELASTOMERS:	
Elastomers, acyclic, all other	PLC.

TABLE 3.--ELASTOMERS (SYNTHETIC RUBBER): DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of elastomers to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ACY	American Cyanamid Co.	HPC	Hercules, Inc.
ADC	Anderson Development Co.		
ASY	American Synthetic Rubber Corp.	ICI	ICI Americas Inc., Chemical Specialties Co.
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group	MMM	Minnesota Mining and Manufacturing Co.
CBN	Cities Service Co., Columbian Div.	PLC	Phillips Petroleum Co.
CPY	Copolymer Rubber & Chemical Corp.	PLR	Polysar, Inc., Polysar Latex Div.
DCC	Dow Corning Corp.	PRC	Products Research & Chemical Corp.
DKA	Denka Chemical Corp.	SHC	Shell Oil Co., Shell Chemical Co. Div.
DUP	E. I. duPont de Nemours & Co., Inc.	SPD	General Electric Co., Silicone Products Dept.
ENJ	Exxon Chemical Americas	SWS	Stauffer Chemical Co., SWS Silicones Div.
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.	TKL	Thiokol Chemical Corp., Specialty Chemical Div.
GNT	General Tire & Rubber Co., Chemical Div.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
GRD	W. R. Grace & Co., Polymers & Chemical Div.	WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.
GYR	Goodyear Tire & Rubber Co.		

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

## STATISTICAL HIGHLIGHTS

J. Lawrence Johnson

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 1,866 million pounds in 1981, an increase of 4.5 percent from the 1,784 million pounds reported for 1980. Sales of plasticizers totaled 1,567 million pounds, valued at \$894 million, in 1981, compared with 1,574 million pounds, valued at \$858 million, in 1980.

Production of cyclic plasticizers in 1981, which consisted chiefly of the esters of phthalic anhydride, phosphoric acid, and trimellitic acid, amounted to 1,458 million pounds, an increase of 5.0 percent from the 1,389 million pounds reported for 1980. Sales of cyclic plasticizers in 1981 totaled 1,209 million pounds, valued at \$622 million, compared with 1,220 million pounds, valued at \$608 million, in 1980. The most important cyclic plasticizers were the dioctyl phthalates, with production of 304 million pounds, in 1981.

Production of acyclic plasticizers in 1981 totaled 407 million pounds, an increase of 3.0 percent from the 396 million pounds reported for 1980. Sales of acyclic plasticizers totaled 358 million pounds, valued at \$271 million, in 1981, compared with 354 million pounds, valued at \$250 million, in 1980. Epoxidized soya oils were the most important acyclic plasticizer in 1981 with production of 83 million pounds.



TABLE 1.--PLASTICIZERS:<sup>1</sup> U.S. PRODUCTION AND SALES, 1981

[Listed below are plasticizers 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 plasticizer chemicals for which data on production and/or sales were reported and identifies the manufacturers of each]

PLASTICIZERS	PRODUCTION		SALES	
	1,000 pounds	1,000 pounds	QUANTITY	UNIT VALUE <sup>2</sup>
			1,000 pounds	Per pound
Grand total-----	1,865,539	1,566,503	893,633	\$0.57
Benzenoid <sup>3</sup> -----	1,600,552	1,316,501	713,276	.54
Nonbenzenoid-----	264,987	250,002	180,357	.72
CYCLIC				
Total-----	1,458,323	1,208,976	622,474	.51
Phosphoric acid esters <sup>4</sup> -----	68,807	60,101	57,091	.95
Phthalic anhydride esters, total-----	1,119,823	1,059,046	511,244	.48
Butyl octyl phthalates-----	11,473	10,091	5,049	.50
Dibutyl phthalates (including diisobutyl phthalates)-----	19,864	21,487	10,715	.50
Diethyl phthalate-----	19,994	16,113	18,181	1.13
Disodecyl phthalate <sup>5</sup> -----	140,395	117,880	56,016	.48
Dimethyl phthalate-----	6,933	7,541	4,506	.60
Dioctyl phthalates, total <sup>5</sup> -----	303,834	291,965	132,870	.46
Di(2-ethylhexyl) phthalate-----	285,399	...	...	...
All other dioctyl phthalates-----	18,435	291,965	132,870	.46
Di-tridecyl phthalate-----	27,839	17,277	10,489	.61
All other phthalic anhydride esters-----	589,491	576,692	273,418	.47
Trimellitic acid esters, total-----	31,629	29,675	22,079	.74
Trisooctyl trimellitate-----	1,478	...	...	...
Tri-n-octyl-n-decyl trimellitate-----	...	673	590	.88
Trioctyl trimellitate-----	19,158	17,666	12,345	.70
All other trimellitic acid esters-----	10,993	11,336	9,144	.81
All other cyclic plasticizers <sup>6</sup> -----	238,064	60,154	32,060	.53
ACYCLIC				
Total-----	407,216	357,527	271,159	.76
Adipic acid esters, total-----	80,419	71,923	52,445	.73
Di(2-ethylhexyl) adipate-----	22,567	26,032	16,498	.63
Disodecyl adipate-----	1,817	1,594	1,335	.84
Diisopropyl adipate-----	...	1,066	906	.85
All other adipic acid esters-----	56,035	43,231	33,706	.78
Complex linear polyesters and polymeric plasticizers, total-----	45,789	41,631	41,629	1.00
Adipic acid type-----	20,035	16,779	16,780	1.00
All other-----	25,754	24,852	24,849	1.00
Epoxidized esters, total-----	115,463	116,355	62,425	.54
Epoxidized linseed oils-----	6,706	7,296	5,907	.81
Epoxidized soya oils-----	83,324	83,317	42,138	.51
All other epoxidized esters-----	25,433	25,742	14,380	.56
Isopropyl myristate-----	2,397	2,469	2,537	1.03
Oleic acid esters, total-----	12,551	12,451	6,976	.56
Butyl oleate-----	1,324	1,359	776	.57
All other oleic acid esters-----	11,227	11,092	6,200	.56

See footnotes at end of table.



TABLE 1.--PLASTICIZERS:<sup>1</sup> U.S. PRODUCTION AND SALES, 1981--CONTINUED

PLASTICIZERS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>2</sup>
ACYCLIC--Continued	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Palmitic acid esters, total-----	7,700	6,120	4,914	\$0.80
Isopropyl palmitate-----	4,728	...	...	...
All other palmitic acid esters-----	2,972	6,120	4,914	.80
Stearic acid esters, total-----	12,466	11,422	7,837	.69
n-Butyl stearate-----	7,601	7,466	4,146	.56
Isobutyl stearate-----	951	970	716	.74
All other stearic acid esters-----	3,914	2,986	2,975	1.00
All other acyclic plasticizers <sup>7</sup> -----	130,431	95,156	92,396	.97

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

<sup>2</sup>Calculated from unrounded figures.

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

<sup>4</sup>Includes data for cresyl diphenyl phosphate, dibutyl phenyl phosphate, diphenyl octyl phosphate, tricresyl phosphate, triphenyl phosphate, and other cyclic phosphoric acid esters.

<sup>5</sup>The difference between the production reported here and that shown on the Preliminary Report on U.S. Production of Selected Organic Chemicals (including Synthetic Plastics and Resin Materials), 1981, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.

<sup>6</sup>Includes data for glycol dibenzoates, toluenesulfonamides, tetrahydrofurfuryl oleate, and other cyclic plasticizers.

<sup>7</sup>Includes data for azelaic acid esters, citric and acetylcitric acid esters, myristic acid esters except isopropyl myristate, pelargonic acid esters, ricinoleic and acetylricinoleic acid esters, glyceryl and glycol esters, phosphoric acid esters, sebacic acid esters and other acyclic plasticizers.

TABLE 2. -- PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981  
 (CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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)

PLASTICIZERS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Diethylene glycol dibenzoate	VEL.
Dipropyl glycol dibenzoate (Dipropylene glycol dibenzoate)	KLM, VEL.
N-Ethyl-p-toluenesulfonamide	MON, MES.
Isopropylidenediphenoxypyranol-	DOM.
*PHOSPHORIC ACID ESTERS:	
Dibutyl phenyl phosphate	MON.
Diphenyl octyl phosphate	MON.
Triphenyl phosphate	FMP, SFS.
Triphenyl phosphate	EK, MON.
*Phosphoric acid esters, all other	MON.
*PHTHALIC ANHYDRIDE ESTERS:	
Alkyl benzyl phthalates	MON.
Bis(2-ethylhexyl)terephthalate	EKT.
Butyl benzyl phthalate	MON.
Butyl cyclohexyl phthalate	CPS.
*Butyl octyl phthalates	DBC, RCI, TEK, USS.
Di(2-butoxyethyl) phthalate	HAL.
*Diethyl phthalate (Including diisobutyl phthalate)	DBC, EKT, HCC, RCI, SHX, USS, WTH.
Dicyclohexyl phthalate	PFZ.
Diethyl isophthalate	PFZ.
*Diethyl phthalate	EKT, KF, MON, PFZ.
*Diisodecyl phthalate	CO, DBC, ENJ, HCC, HN, RCI, TEK, USS.
Diisohexyl phthalate	ENJ, USS.
Diisononyl phthalate	ENJ.
Di(2-methoxyethyl) phthalate	PFZ.
Dimethyl isophthalate	EKT, KF, PFZ.
Dinonyl phthalate	ENJ.
*Di-tridecyl phthalate	ENJ, HCC, HN, RCI, SM, TEK, USS.
Duodecyl phthalate	MON.
Hexyl n-decyl phthalate	CO, HN, PFZ.
*Octyl n-decyl phthalate	RCI, TEK, USS.
*DI-OCTYL PHTHALATES:	
*Di(2-ethylhexyl) phthalate	CO, DBC, EKT, HCC, HN, RCI, TEK, USS.
Diiso-octyl phthalate	HCC, RCI, TEK, USS.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981  
--CONTINUED

PLASTICIZERS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
*PHTHALIC ANHYDRIDE ESTERS--CONTINUED	
*DIOCTYL PHTHALATES--CONTINUED	
Di-n-octyl phthalate	HK.
*Diocetyl phthalates, all other	WTH.
GLYCOL PHTHALATE ESTERS:	
Butyl phthalyl butyl glycolate	PFZ.
Phthalic anhydride esters, all other	HCC, HN, MON, PFZ, TEK, TNA.
Polyethylene glycol dibenzoate	HCC, HN, MON, PFZ, TEK, TNA.
Tetrahydrofurfuryl oleate	VEI.
Toluenesulfonamide <i>o</i> , <i>p</i> -mixtures	ENR.
*TRIMELITIC ACID ESTERS:	MON.
Tri(2-ethylhexyl) trimellitate	HCC, TEK.
Triisodecyl trimellitate	PFZ.
*Triisononyl trimellitate	ENR.
*Triisooctyl trimellitate	ENJ, HKP, RCI, TEK, USS.
Tri-n-octyl n-decyl trimellitate	HKP, PFZ, RCI.
*Triocetyl trimellitate	DBC, EKT, HKP, HN, RCI, USS, WTH.
*All other Trimellitic acid esters	HCC, MON, PFZ, TEK, USS, X.
*Cyclic Plasticizers, all other	HN, MON, NEV, TNA, WTH.
ACYCLIC	
*ADIPIC ACID ESTERS:	
Di(2-(2-butoxyethoxy)ethyl) adipate	EKT, HAL, RCI, TKL.
*Di(2-ethylhexyl) adipate	DBC, EKT, HAL, HCC, HKP, HN, MON, PFZ, RCI, RH, TEK, USS, WM, WTH.
Diisobutyl adipate	HAL, HCC.
*Diisodecyl adipate	HAL, HCC, PFZ, RCI, RH, SM.
Diiso-octyl adipate	HAL, HCC, RH.
*Diisopropyl adipate	VND, WM, WTH.
Di-n-octyl adipate	DA.
Di-tridecyl adipate	ENR, HCC, SM.
n-Hexyl n-decyl adipate	TEK.
n-Octyl n-decyl adipate	MON, RCI, RH, USS.
*Adipic acid esters, all others	ARC, EKT, ENJ, HAL, HCC, MON, PFZ, TEK, USS, WTH.
AZELAIC ACID ESTERS:	
Di(2-ethylhexyl) azelate	EKT, ENR, HAL, RCI.
Diiso-octyl azelate	ENR.
Azelaic acid esters, all others	ENR, HAL, PFZ, TCH.
CITRIC AND ACETYLICITRIC ACID ESTERS:	
Triethyl acetylcitrate	PFZ.
Triethyl acetylcitrate	PFZ.
Triethyl citrate	PFZ.
Citric and acetylcitric acid esters, all other	PFZ.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

--CONTINUED

PLASTICIZERS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*COMPLEX LINEAR POLYESTERS AND POLYMERIC PLASTICIZERS:	
*adipic acid type complex linear polyesters and polymeric plasticizers	DUP, HAL, RH, SHX, TEK, MTH.
*Complex linear polyesters and polymeric plasticizers, all other--	ARZ, DRC, EKT, EKS, EMR, HCC, HN, HPC, MON, PFZ, RCI, RH, SM, VND, WTH.
Di(2-(2-butoxyethoxy)ethyl) methane--	TKL.
*EPOXIDIZED ESTERS:	
*Epoxidized linseed oils--	SHX, SUT, UCC, VIK, WTC.
*Epoxidized soya oils--	FER, FPP, RH, SHX, SMT, UCC, USS, VIK, WTC.
*Epoxidized tall oils--	RH.
Epoxy oleates, mixed--	UCC.
2-ethylhexyl epoxytallates--	MTC.
Dcyl epoxystearates--	RH, WTC.
*Octyl epoxytallates--	UCC, VIK.
*Epoxidized esters, all other--	EKT.
Glyceryl tripropionate--	ARC, SHX, TCH, WM, MTH.
*MYRISTIC ACID ESTERS:	
*Isopropyl myristate--	ARC, CHL, EMR, GRO, HAL, MTH.
Myristyl ethoxy myristate--	SBC, SCP, VND.
*OLEIC ACID ESTERS:	
*Butyl oleate--	EMR, GRO, TCH.
Decyl oleate--	DA.
Glyceryl trioleate (Triolein)--	ARC, EMR, GRO, TCH, WTC.
Isobutyl oleate--	
Methyl oleate--	
*PROPYL OLEATES:	
n-Propyl oleate--	CHL, EMR, GRO, TCH.
*Oleic acid esters, all other--	EMR, HAL, SBC.
*PALMITIC ACID ESTERS:	
2-ethylhexyl palmitate--	VND, WTH.
Isobutyl palmitate--	ARC.
*Iso-octyl palmitate--	ARC.
*Isopropyl palmitate--	ARC, SHX, WM, WTH.
2-methoxyethyl palmitate--	EKT.
*Palmitic acid esters, all other--	EKT, SCP.
*PELAGONIC ACID ESTERS:	
Glycol pelargonate--	EMR.
Isodecyl pelargonate--	EMR.
*PHOSPHORIC ACID ESTERS:	
Triethyl phosphate--	EKT.
Tri-octyl phosphate--	HN.

TABLE 2.--PLASTICIZERS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981  
--CONTINUED

PLASTICIZERS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
Ricinoleic and acetylricinoleic acid esters:	
n-Butyl acetylricinoleate	NIL
Butyl ricinoleate	NIL
Glycerol tri(acetylricinoleate)	NIL
Methyl ricinoleate	NIL
Ricinoleic and acetylricinoleic acid esters, all other--	NIL, RH
*SEBACIC ACID ESTERS:	
dibutoxyethyl sebacate	HAL
dibutyl sebacate	EKT
di(2-ethylhexyl) sebacate	HCG, RH
diisopropyl sebacate	SBC
Sebacic acid esters, all other	HAL
*STEARIC ACID ESTERS:	
Butoxyethyl stearate	ARC
n-Butyl stearate	ARC, CHL, EMR, GRO, SCP, SHX, TCH, WM, WTH
2-Ethylhexyl stearate	SCP, TCH
glyceryl triacetyl stearate	NIL
Hexadecyl stearate	ARC
*Isobutyl stearate	ARC, DA, WM, WTH
Isopropyl stearate	SBC, TCH, WTH
Methyl pentachlorostearate	VDM
Stearic acid esters, all other	GRO, HPC, SBC, SCP, TCH, VND, WM
Sucrose acetate isobutyrate	EKI
Tetraethylene glycol di(2-ethylhexanoate)	HAL, UCC
Triethylene glycol di(caprylate-caprate)	HAL, WM
Triethylene glycol di(2-ethylbutyrate)	UCC
Tetraethylene glycol di(2-ethylhexanoate)	EKT, HAL
2,2,4-trimethyl-1,3-pentanediol diisobutyrate	EKK
*Acyclic plasticizers, all other--	ARC, EMR, HAL, HPC, SH, TCH, UCC, WM, WTH

TABLE 3.--PLASTICIZERS: DIRECTORY OF MANUFACTURERS, 1981

ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of plasticizers to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ARC	: Armak Co., Industrial Chemical Div.	NES	: Ruetgers-Nease Chemical Co.
ARZ	: Arizona Chemical Co.	NEV	: Neville Chemical Co.
CHL	: Chemol, Inc.	NTL	: NL Industries, Inc.
CO	: Conoco, Inc.	PFZ	: Pfizer, Inc.
CPS	: CPS Chemical Co.	RCI	: Reichhold Chemicals, Inc.
DA	: Diamond Shamrock Corp.	RH	: Rohm & Haas Co.
DCB	: Badische Corp.	SBC	: Scher Chemicals, Inc.
DOW	: Dow Chemical Co.	SCP	: Henkel, Inc.
DRC	: Dock Resins Corp.	SFS	: Stauffer Chemical Co., Specialty Div.
DUP	: E. I. duPont de Nemours & Co., Inc.	SHX	: Sherex Chemical Co., Inc.
EK	: Eastman Kodak Co.:	SM	: Mobil Oil Corp., Mobil Chemical Co., Chemical
EKT	: Tennessee Eastman Co. Div.		: Coatings Div.
EKX	: Texas Eastman Co. Div.	SWT	: Eschem Inc., Swift Technical Products Div.
EMR	: Emery Industries, Inc.	TCH	: Emery Industries, Inc., Trylon Div.
ENJ	: Exxon Chemical Americas	TEK	: Teknor Apex Co.
FER	: Ferro Corp., Ferro Chemical Div.	TKL	: Thiokol Corp., Specialty Chemicals Div.
FMP	: FMC Corp., Industrial Chemical Group	TNA	: Ethyl Corp.
GRO	: A. Cross & Co., Millmaster Onyx Group,	UCC	: Union Carbide Corp.
	: Keweenaw Industries, Inc.	USS	: USS Chemicals Div. of U.S. Steel Corp.
HAL	: C. P. Hall Co.	VDM	: Van De Mark Chemical Co., Inc.
HCC	: Hatco Chemical Corp.	VEL	: Velsicol Chemical Corp.
HKD	: Hooker Chemicals Corp., PVC Div.	VIK	: Viking Chemical Co.
HN	: Tenneco Chemicals, Inc.	VND	: Van Dyk & Co., Inc.
HPC	: Hercules, Inc.	WM	: American Can Co., Inolex Chemical Div.
KF	: Kay-Fries Inc., Member Dynamit Nobel Group	WTC	: Witco Chemical Corp.
KLM	: Kalama Chemical, Inc.	WTH	: Union Camp Corp.
MON	: Monsanto Co.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 52 reporting companies and company divisions for which permission to publish was not restricted.



## STATISTICAL HIGHLIGHTS

Eric Land

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 1981 amounted to 5,078 million pounds, or 4.6 percent greater than the 4,853 million pounds reported for 1980. Sales of bulk surface-active agents in 1981 amounted to 3,104 million pounds, valued at \$1,477 million, compared with sales in 1980 of 2,928 million pounds, valued at \$1,296 million. In terms of quantity, sales in 1981 were 6.0 percent greater than in 1980.

Production of anionic surface-active agents in 1981 amounted to 3,353 million pounds, or 66.0 percent of the total surfactant output reported for 1981. Sales of anionics in 1981 amounted to 1,655 million pounds, valued at \$541 million.

Production of cationic surface-active agents in 1981 amounted to 337 million pounds, 8.5 percent more than the 311 million pounds reported in 1980. Production of nonionic surface-active agents amounted to 1,369 million pounds in 1981, 3.7 percent more than the 1,320 million pounds reported in 1980. Sales of cationic surface-active agents in 1981 increased by 7.8 percent in terms of quantity and increased by 14.3 percent in terms of value when compared with sales in 1980. Sales of nonionics in 1981 increased by 10.0 percent in terms of quantity and increased by 14.3 percent in terms of value when compared with sales in 1980.



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

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1981

[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 <sup>1</sup>		SALES <sup>2</sup>	
	QUANTITY <sup>1</sup>	VALUE	UNIT VALUE <sup>3</sup>	
	1,000 pounds	1,000 dollars	Per pound	
Grand total-----	5,078,208	3,104,293	1,476,519	\$0.48
Benzenoid <sup>4</sup> -----	1,229,201	665,700	366,860	.55
Nonbenzenoid <sup>5</sup> -----	3,849,007	2,438,593	1,109,659	.46
<i>AMPHOTERIC</i>				
Total-----	18,795	17,082	23,595	1.38
<i>ANIONIC</i>				
Total-----	3,352,944	1,655,306	540,841	.33
Carboxylic acids (and salts, thereof), total-----	846,523	141,417	81,999	.58
Amine salts of fatty, rosin, and tall oil acids----	1,863	508	756	1.49
Carboxylic acids having amide, ester, or ether linkages-----	4,106	3,400	5,077	1.49
Coconut oil acids, potassium salt-----	2,385	990	778	.79
Coconut oil acids, sodium salt-----	133,534	1,920	667	.35
Oleic acid, potassium salt-----	1,832	...	...	...
Stearic acid, potassium salt-----	481	...	...	...
Tall oil acids, potassium salt-----	6,244	3,264	1,598	.49
Tallow acids, sodium salt-----	385,952	17,279	4,769	.28
All other carboxylic acids (and salts thereof)-----	310,126	114,056	68,354	.60
Phosphoric and polyphosphoric acid esters (and salts thereof), total-----	42,486	31,655	28,964	.91
Alcohols and phenols, alkoxylated and phosphated, total-----	27,952	24,006	19,747	.82
Mixed linear alcohols, ethoxylated and phosphated-----	3,858	2,942	2,781	.95
Nonylphenol, ethoxylated and phosphated-----	15,123	14,123	9,497	.67
Phenol, ethoxylated and phosphated-----	2,498	2,272	2,440	1.07
Tridecyl alcohol, ethoxylated and phosphated-----	740	...	...	...
All other-----	5,733	4,669	5,029	1.08
All other phosphoric and polyphosphoric acid esters (and salts thereof), total-----	14,534	7,649	9,217	1.20
2-Ethylhexyl phosphate, sodium salt-----	292	...	...	...
Mixed alkyl phosphate-----	3,146	...	...	...
All other-----	11,096	7,649	9,217	1.20
Sulfonic acids (and salts thereof), total-----	1,847,986	1,241,931	274,793	.22
Alkylbenzenesulfonates, total-----	640,219	164,509	86,488	.53
Dodecylbenzenesulfonic acid-----	200,845	101,412	47,156	.46
Dodecylbenzenesulfonic acid, calcium salt-----	13,429	9,574	8,654	.90
Dodecylbenzenesulfonic acid, isopropylamine salt-----	3,141	3,072	2,536	.83
Dodecylbenzenesulfonic acid, sodium salt-----	283,628	36,751	18,473	.50
Dodecylbenzenesulfonic acid, triethanolamine salt-----	6,504	5,722	3,451	.60
All other-----	132,672	7,978	6,218	.78
Benzene-, cumene-, toluene-, and xylenesulfonates, total-----	109,273	94,959	23,695	.25
Xylenesulfonic acid, ammonium salt-----	21,422	21,308	5,857	.27
Xylenesulfonic acid, sodium salt-----	60,131	52,707	11,108	.21
All other-----	27,720	20,944	6,730	.32

See footnotes at end of table.

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	PRODUCTION <sup>1</sup>	SALES <sup>2</sup>		
		QUANTITY <sup>1</sup>	VALUE	UNIT VALUE <sup>3</sup>
<i>ANIONIC--Continued</i>	<i>1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>Per</i>
	<i>pounds</i>	<i>pounds</i>	<i>dollars</i>	<i>pound</i>
Sulfonic acids (and salts thereof)--Continued				
Ligninsulfonates, total-----	958,248	881,806	78,032	\$0.09
Ligninsulfonic acid, calcium salt-----	634,679	570,819	28,546	.05
Ligninsulfonic acid, chromium salt-----	124,027	123,225	22,229	.18
Ligninsulfonic acid, sodium salt-----	149,766	138,641	19,383	.14
All other-----	49,776	49,121	7,874	.16
Naphthalenesulfonates-----	21,918	19,883	13,267	.67
Sulfonic acids having amide linkages, total-----	6,199	4,448	6,025	1.35
Sulfosuccinamic acid derivatives-----	2,973	2,275	2,353	1.03
Taurine derivatives-----	2,925	1,919	3,495	1.82
All other-----	301	254	177	.70
Sulfonic acids having ester or ether linkages, total-----	67,114	31,724	44,149	1.39
Sulfosuccinic acid esters, total-----	24,794	19,712	22,203	1.13
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt-----	19,050	14,822	18,419	1.24
All other-----	5,744	4,890	3,874	.77
Other sulfonic acids having ester or ether linkages-----	42,320	12,012	21,946	1.83
All other sulfonic acids (and salts thereof)-----	45,015	44,602	23,137	.52
Sulfuric acid esters (and salts thereof), total-----	569,446	217,937	145,789	.67
Acids, amides, and esters, sulfated, total-----	21,493	16,383	11,066	.68
Butyl oleate, sulfated, sodium salt-----	1,077	...	...	...
Oleic acid, sulfated, disodium salt-----	4,354	4,333	2,043	.47
Propyl oleate, sulfated, sodium salt-----	297	153	116	.76
Tall oil sulfated, sodium salt-----	1,890	1,161	368	.32
All other-----	13,875	10,736	8,539	.80
Alcohols, sulfated, total-----	261,771	61,365	59,467	.97
Dodecyl sulfate, magnesium salt-----	229	152	173	1.14
Dodecyl sulfate, sodium salt-----	20,486	19,939	19,295	.97
Dodecyl sulfate, triethanolamine salt-----	10,552	6,751	6,674	.99
Mixed linear alcohols, sulfated, ammonium salt-----	44,006	5,795	5,654	.98
Mixed linear alcohols, sulfated, sodium salt-----	...	8,936	7,581	.85
Mixed linear alcohols, sulfated, triethanolamine salt-----	14,367	3,388	3,466	1.02
Octyl sulfate, sodium salt-----	337	287	390	1.36
All other-----	171,794	16,117	16,234	1.01
Castor oil, sulfated, sodium salt-----	4,984	4,338	2,513	.58
Cod oil, sulfated, sodium salt-----	1,954	1,625	521	.32
Ethers, sulfated, total-----	269,185	126,437	69,582	.55
Alkylphenols, ethoxylated and sulfated-----	5,322	4,073	4,033	.99
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt-----	4,275	3,641	2,468	.68
Dodecyl alcohol, ethoxylated and sulfated, sodium salt-----	15,728	14,738	13,268	.90
Mixed linear alcohols, ethoxylated and sulfated, sodium salt-----	135,919	26,208	15,175	.58
All other-----	107,941	77,777	34,638	.45
Herring oil, sulfated, sodium salt-----	1,435	1,111	385	.35
Mixed fish oils, sulfated, sodium salt-----	4,318	4,006	1,385	.35
Neat's foot oil, sulfated, sodium salt-----	1,488	...	...	...
Soybean oil, sulfated, sodium salt-----	529	537	199	.37
Tallow sulfated, sodium salt-----	2,289	2,135	671	.31
Other anionic surface-active agents <sup>6</sup> -----	46,503	22,366	9,296	.42

See footnotes at end of table.

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	SALES <sup>2</sup>				
	PRODUCTION <sup>1</sup>		QUANTITY <sup>1</sup>	VALUE	UNIT VALUE <sup>3</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound	
<i>CATIONIC</i>					
Total-----	337,241	256,045	228,146	\$0.89	
Amine oxides and oxygen-containing amines (except those having amide linkages), total-----	80,365	27,307	28,510	1.04	
Acyclic, total-----	68,514	18,690	18,190	.97	
(Coconut oil alkyl)amine, ethoxylated-----	2,246	...	...	...	
(Mixed alkyl)amine, ethoxylated-----	2,060	...	...	...	
(Tallow alkyl)amine, ethoxylated-----	2,117	1,572	1,316	.84	
All other-----	62,091	17,118	16,874	.93	
Cyclic (including imidazoline and oxazoline derivatives), total-----	11,851	8,617	10,320	1.20	
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline-----	...	145	201	1.38	
1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2- imidazoline-----	146	...	...	...	
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2- imidazoline-----	872	...	...	...	
All other-----	10,833	8,472	10,119	1.19	
Amines and amine oxides having amide linkages, total-----	46,984	36,091	28,700	.80	
Stearic acid-diethylenetriamine condensate-----	327	306	376	1.23	
Tall oil acids polyalkylenepolyamine condensate-----	21,907	18,141	13,653	.75	
All other-----	24,750	17,644	14,671	.83	
Amines, not containing oxygen (and salts thereof), total-----	81,722	75,118	68,433	.91	
Diamines, polyamines, and amine salts, total-----	30,791	25,966	22,442	.86	
Imidazoline derivatives-----	1,146	880	1,489	1.69	
N-(9-Octadecenyl)trimethylenediamine-----	3,874	3,503	3,724	1.06	
N-(Tallow alkyl)dipropylenetriamine-----	217	...	...	...	
N-(Tallow alkyl)trimethylenediamine-----	8,367	6,691	5,378	.80	
All other-----	17,187	14,892	11,851	.80	
Primary monoamines, total-----	24,205	22,259	18,510	.83	
9-Octadecenylamine-----	5,488	5,373	4,708	.88	
Octadecylamine-----	728	...	...	...	
(Tallow alkyl)amine-----	8,505	7,412	5,058	.68	
All other-----	9,484	9,474	8,744	.92	
Secondary and tertiary monoamines, total-----	26,726	26,893	27,481	1.02	
N,N-Dimethyl(coconut oil alkyl)amine-----	158	...	...	...	
N,N-Dimethylhexadecylamine-----	397	371	441	1.19	
N,N-Dimethyloctadecylamine-----	1,239	1,285	1,618	1.26	
All other-----	24,932	25,237	25,422	1.01	
Quaternary ammonium salts, not containing oxygen, total-----	103,296	97,380	82,949	.85	
Acyclic, total-----	74,250	70,465	50,716	.72	
Bis(hydrogenated tallow alkyl)dimethylammonium chloride-----	47,765	47,118	26,674	.57	
Trimethyl(tallow alkyl)ammonium chloride-----	1,335	1,322	1,160	.88	
All other-----	25,150	22,025	22,882	1.04	
Benzenoid, total-----	29,046	26,915	32,233	1.20	
Benzyl(coconut oil alkyl)dimethylammonium chloride-----	417	267	383	1.43	
Benzylidimethyl(mixed alkyl)ammonium chloride-----	12,392	12,531	16,461	1.31	
Benzylidimethyloctadecylammonium chloride-----	2,962	2,559	4,575	1.79	
Benzyltrimethylammonium chloride-----	3,487	3,669	2,105	.57	
All other-----	9,788	7,889	8,709	1.10	
Other cationic surface-active agents <sup>7</sup> -----	24,874	20,149	19,554	.97	

See footnotes at end of table.

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	PRODUCTION <sup>1</sup>		SALES <sup>2</sup>	
	QUANTITY <sup>1</sup>	VALUE	QUANTITY <sup>1</sup>	UNIT VALUE <sup>3</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
<i>NONIONIC</i>				
Total-----	1,369,228	1,175,860	683,937	\$0.58
Carboxylic acid amides, total-----	66,366	50,828	37,451	.74
Diethanolamine condensates (amine/acid ratio=2/1), total-----	19,551	14,566	10,272	.71
Coconut oil acids-----	10,315	8,115	5,397	.66
Coconut oil and tallow acids-----	1,971	1,886	1,252	.66
Lauric acid-----	143	...	...	...
Lauric and myristic acids-----	1,732	1,146	1,043	.91
Oleic acid-----	664	...	...	...
Tall oil acids-----	931	274	210	.76
All other-----	3,795	3,145	2,370	.75
Diethanolamine condensates (other amine/acid ratios), total-----	30,368	28,201	21,024	.75
Coconut oil acids (amine/acid ratio=1/1)-----	21,562	20,439	14,409	.70
Lauric acid (amine/acid ratio=1/1)-----	3,685	2,789	2,541	.91
Lauric and myristic acids (amine/acid ratio=1/1)-----	2,965	2,876	2,388	.82
Linoleic acid (amine/acid ratio=1/1)-----	1,031	988	819	.83
Stearic acid (amine/acid ratio=1/1)-----	88	69	40	.58
All other-----	1,037	1,020	827	.81
All other carboxylic acid amides-----	16,447	8,061	6,155	.76
Carboxylic acid esters, total-----	242,583	189,190	143,614	.76
Anhydrosorbitol esters, total-----	30,603	20,015	16,397	.82
Anhydrosorbitol mono-oleate-----	5,133	3,212	2,894	.90
All other-----	25,470	16,803	13,503	.80
Diethylene glycol esters, total-----	2,521	711	654	.92
Diethylene glycol monolaurate-----	81	78	68	.86
Diethylene glycol mono-oleate-----	59	42	38	.91
Diethylene glycol monostearate-----	...	172	173	1.00
All other-----	2,381	419	375	.89
Ethoxylated anhydrosorbitol mono-oleate-----	3,744	3,172	2,594	.82
Ethylene glycol distearate-----	...	2,658	1,448	.54
Ethylene glycol monostearate-----	2,954	2,820	2,072	.73
Glycerol esters of chemically defined acids, total-----	22,163	18,594	13,680	.74
Glycerol mono-oleate-----	3,791	2,825	2,204	.78
Glycerol monoricinoleate-----	65	67	84	1.25
Glycerol monostearate-----	17,360	14,812	10,377	.70
All other-----	947	890	1,015	1.14
Glycerol esters of mixed acids-----	39,794	34,034	24,860	.73
Natural fats and oils, ethoxylated, total-----	18,802	13,806	10,750	.78
Castor oil, ethoxylated-----	8,297	5,528	4,133	.75
Hydrogenated castor oil, ethoxylated-----	3,916	...	...	...
Lanolin, ethoxylated-----	1,302	981	874	.89
All other-----	5,287	7,297	5,743	.79
Polyethylene glycol esters, total-----	48,869	39,405	23,374	.59
Polyethylene glycol dilaurate-----	1,090	1,008	1,079	1.07
Polyethylene glycol dioleate-----	2,402	907	754	.83
Polyethylene glycol distearate-----	2,624	...	...	...
Polyethylene glycol monolaurate-----	4,662	3,986	3,289	.83
Polyethylene glycol mono-oleate-----	5,345	4,483	3,309	.74
Polyethylene glycol monostearate-----	7,101	5,106	4,361	.85
Polyethylene glycol sesquiester of tall oil acids-----	16,752	...	...	...
All other-----	8,893	23,915	10,582	.44
Polyglycerol esters-----	866	791	1,017	1.29
Propanediol esters-----	2,754	2,296	2,446	1.07
All other carboxylic acid esters-----	69,513	50,888	44,322	.87

See footnotes at end of table.

TABLE 1.--SURFACE-ACTIVE AGENTS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	PRODUCTION <sup>1</sup>	SALES <sup>2</sup>		
		QUANTITY <sup>1</sup>	VALUE	UNIT VALUE <sup>3</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
<i>NONIONIC--Continued</i>				
Ethers, total-----	1,021,752	924,841	494,087	\$0.53
Benzenoid ethers, total-----	372,506	318,079	166,018	.52
Dinonylphenol, ethoxylated-----	6,239	4,929	3,811	.77
Dodecylphenol, ethoxylated-----	14,365	13,297	7,436	.56
Nonylphenol, ethoxylated-----	268,498	243,018	117,724	.48
Phenol, ethoxylated-----	1,909	1,154	856	.74
All other-----	81,495	55,681	36,191	.65
Nonbenzenoid ethers, total-----	575,508	540,376	278,243	.51
Chemically-defined linear alcohols, alkoxylated, total-----	15,531	10,412	9,932	.95
Decyl alcohol, ethoxylated-----	5,391	3,138	1,854	.59
Dodecyl alcohol, ethoxylated-----	3,046	2,831	2,450	.87
9-Octadecyl alcohol, ethoxylated-----	1,465	561	623	1.11
Oleyl alcohol, ethoxylated-----	823	725	1,329	1.83
All other-----	4,806	3,157	3,676	1.16
Mixed linear alcohols, alkoxylated, total-----	559,977	529,964	268,311	.51
Mixed linear alcohols, ethoxylated-----	498,165	473,021	244,383	.52
Mixed linear alcohols, ethoxylated and pro-poxylated-----	27,086	24,131	15,624	.65
Tallow alcohol, ethoxylated-----	5,937	...	...	...
All other-----	28,789	32,812	8,304	.25
Other ethers and thioethers, total-----	73,738	66,386	49,826	.75
Mixed alcohols, ethoxylated-----	427	...	...	...
Tridecyl alcohol, ethoxylated-----	12,742	8,660	5,619	.65
All other-----	60,569	57,726	44,207	.77
Other nonionic surface-active agents-----	38,527	11,001	8,785	.80

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

<sup>2</sup>Sales include products sold as bulk surface-active agents only.

<sup>3</sup>Calculated from unrounded figures.

<sup>4</sup>The term "benzenoid" used in this report, describes any surface-active agents, 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).

<sup>5</sup>Includes ligninsulfonates.

<sup>6</sup>Includes all other natural fats and oils, sulfated.

<sup>7</sup>Includes quaternary ammonium salts, containing oxygen.



TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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]

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
AMPHOTERIC	
1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolium hydroxide, disodium salt	BRD.
(1-Carboxyheptadecyl)trimethylammonium hydroxide, inner salt	DUP.
(Carboxymethyl)[3-(coconut oil amido)propyl]-dimethylammonium chloride, sodium salt	X.
(Carboxymethyl)[3-(coconut oil amido)propyl]-dimethylammonium hydroxide, inner salt	CYL, HLI, JOB, WM.
1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolium hydroxide, sodium derivative, sodium salt	MIR, X.
N-(Coconut oil alkyl)- $\beta$ -alanine, sodium salt	DUP, SCP.
N-Dodecyl-3-imanodipropionic acid	SCP.
N-Dodecyl-3-imanodipropionic acid, disodium salt	SCP.
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	RH.
(Mixed alkyl)sulfobetaine	MOA.
Polypeptide ammonium salt	STP.
Polypeptide, sodium salt	STP.
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	SCP.
Amphoteric surface-active agents, all other	ARC, BRD, CRD, MIR, MOA, SBC, SCP, TCH.
ANTONIC	
*CARBOXYLIC ACIDS (AND SALTS THEREOF):	
*AMINE SALTS OF FATTY, ROSIN, AND TALL OIL ACIDS:	
Coconut oil acids, ethanolamine salt	SBP.
Mixed fatty acids, ethanolamine salt	SBP.
Oleic acid, butylamine salt	DYS.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANIONIC--CONTINUED	
*CARBOXYLIC ACIDS (AND SALTS THEREOF)--CONTINUED	
*AMINE SALTS OF FATTY, ROSIN, AND TALL OIL	
ACIDS--CONTINUED	
Oleic acid, diethanolamine salt	: WIC.
Rosin acids, triethanolamine salt	: AES, ONX.
Stearic acid,N,N',N'-tetraakis(2-hydroxyethyl)- ethylenediamine salt	: ICI.
Stearic acid, triethanolamine salt	: GLY.
Tall oil acids, diethanolamine salt (Condensate)	: CYL.
Tallow acids, triethanolamine salt	: SBP.
Tallow acids, triethanolamine salt	: SBP.
Amine salts of fatty, rosin, and tall oil acids, all other	: WM, X.
*CARBOXYLIC ACIDS HAVING AMIDE, ESTER, OR ETHER LINKAGES:	
N-(Coconut oil acyl)polypeptide, potassium salt	: STP.
N-(Coconut oil acyl)polypeptide, sodium salt	: STP.
N-(Coconut oil acyl)polypeptide, triethanolamine salt	: STP.
N-(Coconut oil acyl)sarcosine, sodium salt	: HMP.
N-Lauroylsarcosine	: HMP.
N-Lauroylsarcosine, sodium salt	: HMP, ONX.
N-Oleoylpolypeptide, sodium salt	: LMI.
N-Oleoylsarcosine	: HMP.
N-Oleoylsarcosine, sodium salt	: GAF.
Tridecylpoly(ethyleneoxy)acetic acid, sodium salt	: BRD, STC.
Carboxylic acids with amide, ester or ether linkage, other	: CHP, HMP, S, STC, STP.
POTASSIUM AND SODIUM SALTS OF FATTY, ROSIN, AND TALL OIL ACIDS:	
Castor oil acids, potassium salt	: NTL, SEA.
Castor oil acids, sodium salt	: HEM.
*Coconut oil acids, potassium salt	: AES, CON, CYL, DYS, ESS, HEW, HIP, HNT, LUR, MMC, PEK, : PG, PHX, SOP, X.
*Coconut oil acids, sodium salt	: AGP, BSM, CON, CP, HEM, JRG, LEV, MMC, NPR, PG, SOP.
Corn oil acids, potassium salt	: HNT, MMC.
Fish oil acids, sodium salt	: PG.
Mixed vegetable fatty acids, potassium salt	: AES, DYS, GRL, OCP.
*Oleic acid, potassium salt	: AES, DA, HAL, HNT, USR, WBG, X.
Oleic acid, sodium salt	: BSM, : USR, WBG, WTC.
Olive oil acids, sodium salt	: HNT.
Palm oil acids, sodium salt	: BSM, HEW.
Rosin acids, potassium salt	: HPC, PEK.



TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANIONIC--CONTINUED	
*CARBOXYLIC ACIDS (AND SALTS THEREOF)--CONTINUED	
POTASSIUM AND SODIUM SALTS OF FATTY, ROSIN, AND TALL OIL ACIDS--CONTINUED	
Rosin acids, _____	HPC, HRT, SLM.
Soybean oil acids, potassium salt _____	LUR, PEK, PNX.
*Stearic acid, potassium salt _____	CCC, CON, DA, HEW, WTC.
Stearic acid, sodium salt _____	CCC, WTC.
*Tall oil acids, potassium salt _____	AES, ASY, CON, DAN, DYS, ESS, HTP, HPC, PEK, PNX, SOP, X.
Tall oil acids, sodium salt _____	AES, CON, GDC, HPC, NMC, WVA.
Tallow acids, potassium salt _____	AES, AGP, ASY, DYS, PG, PNX.
*Tallow acids, sodium salt _____	BSW, CON, CP, HEW, JRG, LEV, NMC, NPR, PG, PRX.
Potassium and sodium salts of fatty, rosin, and tall oil acids, all other _____	ARZ, DYS, HEW, NMC, PG, USR.
OTHER CARBOXYLIC ACIDS:	
*CARBOXYLIC ACIDS, all other _____	BSW, KPI, MRV, SCP.
*PHOSPHORIC AND POLYPHOSPHORIC ACID ESTERS (AND SALTS THEREOF):	
*ALCOHOLS AND PHENOLS, ALKOXYLATED AND PHOSPHATED:	
Butyl alcohol, ethoxylated and phosphated _____	GAF.
Dinonylphenol, ethoxylated and phosphated _____	GAF, MOA, TCH, MAY, WTC.
Dodecyl alcohol, ethoxylated and phosphated _____	GAF, JOB.
Dodecylphenol, ethoxylated and phosphated _____	GAF.
2-Ethylhexanol, ethoxylated and phosphated _____	DA, WAY.
*Mixed linear alcohols, ethoxylated and phosphated _____	MRV, SCP, SHX, STC, TCH, WTC.
*Nonylphenol, ethoxylated and phosphated _____	ARL, AZS, BRD, CRT, CTL, CYL, DA, DEX, GAF, GDC, HRT, MCP, MET, MOA, SCP, SOP, STC, TCC, VPC, WAY, WTC.
9-Octadecenyl alcohol, ethoxylated and phosphated _____	WVA, X.
9-Octadecyl alcohol, ethoxylated and phosphated _____	GAF.
Octylphenol, ethoxylated and phosphated _____	RH.
Octylphenol, ethoxylated and phosphated, magnesium salt _____	ONX.
*Phenol, ethoxylated and phosphated _____	GAF, MOA, RH, TCH, WTC, X.
Polynhric alcohol, ethoxylated and phosphated _____	DEX, GAF, SCP.
Polypyrrolene glycol, phosphated _____	CID.
*Tridecyl alcohol, ethoxylated and phosphated _____	DAN, GAF, HIP, MIL, SKW, VPC, X.
Alcohols and phenols, alkoxyated and phosphated or polyphosphated, all other _____	CHP, DA, GAF, MCP, MIL, MOA, TCH, X.
ALCOHOLS, PHOSPHATED OR POLYPHOSPHATED:	
Butyl phosphate, potassium salt _____	DUP.
Decyl and octyl phosphate _____	DA.
2-Ethylhexyl phosphate _____	CHP, GAF.

TABLE 2. --SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1961--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANIONIC--CONTINUED	
*PHOSPHORIC AND POLYPHOSPHORIC ACID ESTERS (AND SALTS THEREOF)--CONTINUED	
ALCOHOLS, PHOSPHATED OR POLYPHOSPHATED--CONTINUED	
#2-Ethylhexyl phosphate, sodium salt	CHP, DAN, WTC.
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	CTL, DUP, SCP, SFS, STC, X.
Mixed alkyl phosphate, diethanolamine salt	DUP, SCP.
9-Octadecenyl phosphate	DA.
Octyl decyl phosphate	DUP.
Octyl phosphate	FTX, SCP, WTC.
Octyl phosphate, alkylamine salt	SCP.
Octyl phosphate, potassium salt	DEX.
Octyl polyphosphate	DEX.
Octyl polyphosphate, potassium salt	SNM, X.
Phosphated and polyphosphated alcohols, all other	BAS, CCC, CHP, HRT, KPI, MIL, RCD, X.
OTHER PHOSPHORIC AND POLYPHOSPHORIC ACID ESTERS:	
Glycerol monoester of mixed fatty acids, phosphate	GCP, WTC.
Phosphoric and polyphosphoric acid esters, all other	MIL, SCP, X.
*SULFONIC ACIDS (AND SALTS THEREOF):	
*ALKYLBENZENESULFONATES:	
DODECYLBENZENESULFONATES:	
*Dodecylbenzenesulfonic acid--	
Dodecylbenzenesulfonic acid, (Mixed alkyl)amine salt	AAC, ARC, CHT, CO, CRT, CTL, EHK, FTX, HLI, LEV, MON, PIL, PLX, PRX, RCD, STP, TCI, TEN, WTC, WVA, X.
Dodecylbenzenesulfonic acid, ammonium salt	ECC, HIP, X.
Dodecylbenzenesulfonic acid, calcium salt	AES, GCC.
Dodecylbenzenesulfonic acid, diethanolamine salt	DA, ICI, RCD, RH, STC, STP, TNH, WTC, WVA, X.
Dodecylbenzenesulfonic acid, isopropanolamine salt	CYL.
Dodecylbenzenesulfonic acid, isopropylamine salt	FTX, PIL.
Dodecylbenzenesulfonic acid, isopropylamine salt	CIN, CMT, CTL, ICI, RCD, STP, TCH, WTC.
Dodecylbenzenesulfonic acid, potassium salt	AES, HKV, SVC, WVA.
Dodecylbenzenesulfonic acid, sodium salt	AAC, AES, APX, BLA, CMT, CO, CP, CTL, CYL, DUP, ECC, GDC, HLI, LEV, NMC, PER, PG, PIL, PLX, PRX, RCD, SOP, STP, TEN, WTC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANIONIC--CONTINUED	
*SULFONIC ACIDS (AND SALTS THEREOF)--CONTINUED	
ALKYLBENZENESULFONATES--CONTINUED	
DODECYLBENZENESULFONATES--CONTINUED	
*Dodecylbenzenesulfonic acid, triethanolamine salt	AAC, ARL, BBD, CCC, CIM, CTL, CYL, ESS, HLI, HRV, PIL, RCD, STP, WTC, X.
Dodecylbenzene sulfonates, all other	DA, KPI, WTC.
OTHER ALKYLBENZENESULFONATES:	
Decylbenzenesulfonic acid, sodium salt	CR1.
Didodecylbenzenesulfonic acid	WTC.
Pentadecylbenzenesulfonic acid, potassium salt	STP.
Tridecylbenzenesulfonic acid	PLX, RCD.
Tridecylbenzenesulfonic acid, sodium salt	BLA, CP, NPR, PG, RCD, WTC.
Undecylbenzene sulfonic acid	SCP.
Undecylbenzene sulfonic acid, sodium salt	SCP, WTC.
Undecylbenzene sulfonic acid, triethanolamine salt	SCP.
Alkylbenzene sulfonates, all other	PIL, SCP.
*BENZENE-, CUMENE-, TOLUENE-, AND XYLENESULFONATES:	
Cumenesulfonic acid, ammonium salt	NES, WTC.
Cumenesulfonic acid, sodium salt	CP, NES, WTC.
Toluenesulfonic acid, potassium salt	NES.
Toluenesulfonic acid, sodium salt	CO, NES, PG.
*Xylenesulfonic acid, ammonium salt	CO, NES, STP, WTC.
*Xylenesulfonic acid, sodium salt	CO, ICI, MES, PIL, SDC, STP, WTC.
*LIGNINESULFONATES:	
Ligninsulfonic acid, ammonium salt	CRZ, MAR, SPA.
Ligninsulfonic acid, calcium salt	CRZ, CUP, FEC, LKY, MAR, PSP.
*Ligninsulfonic acid, chromium salt	MAR, PSP, RAY.
Ligninsulfonic acid, iron salt	CRZ, MAR, PSP.
Ligninsulfonic acid, magnesium salt	MAR.
*Ligninsulfonic acid, sodium salt	CRZ, MAR, PSP, RAY, WVA.
Ligninsulfonic acid, zinc salt	MAR, PSP.
Ligninsulfates, all other	PSP.
*NAPHTHALENESULFONATES:	
Butylnaphthalenesulfonic acid, sodium salt	DA, ECC, UDI.
Diethylnaphthalenesulfonic acid	UDI.
Diisopropylnaphthalenesulfonic acid, sodium salt	DA, DUP, UDI.
Isopropylnaphthalenesulfonic acid	DA, UDI.
Methylenebis(2-naphthalenesulfonic acid)	SYT.
Methylenebis(2-naphthalenesulfonic acid), sodium salt	DUP.
Methylnaphthalenesulfonic acid, sodium salt	DA, UDI.
Methylnonylnaphthalenesulfonic acid, sodium salt	UDI.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANTONIC--CONTINUED	
*SULFONIC ACIDS (AND SALTS THEREOF)--CONTINUED	
*NAPHTHALENESULFONATES--CONTINUED	
Naphthalenesulfonates, all other	ICI, UDI, X.
*SULFONIC ACIDS HAVING AMIDE LINKAGES:	
*SULFOSUCCINIC ACID DERIVATIVES:	
N-(1,2-Diacetoxyethyl)-N-octadecylsulfosuccinamic acid, tetrasodium salt	ACY, MOA.
N-Octadecylsulfosuccinamic acid, disodium salt	ACY.
N-(Oleoyloxypropyl)sulfosuccinamic acid	WTC.
Sulfosuccinamic acid derivatives, all other	ICH.
*TAURINE DERIVATIVES:	
N-(Coconut oil acyl)-N-methyltaurine, sodium salt	FTX, GAF, STC, THI.
N-Cyclohexyl-N-palmitoyltaurine, sodium salt	GAF.
N-Methyl-N-oleoyltaurine, sodium salt	GAF, HRT, STC.
N-Methyl-N-palmitoyltaurine, sodium salt	GAF.
N-Methyl-N-(tall oil acyl)taurine, sodium salt	CCC, FTX, GAF, MVA.
*ALL OTHER SULFONIC ACIDS HAVING AMIDE LINKAGES:	
*Sulfonic acids having amide linkages, all other	S, STC, TCH, WTC.
*SULFONIC ACIDS HAVING ESTER OR ETHER LINKAGES:	
*SULFOSUCCINIC ACID ESTERS:	
*Sulfosuccinic acid, bis(2,6-dimethyl-4-heptyl)-ester, sodium salt	MOA, PC.
*Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	ACY, ARI, CHP, CRT, DA, DAN, ECC, EMK, FTX, HDG, HIP, HPT, MCP, MOA, MRV, RH, SCO, STC, WTC.
Sulfosuccinic acid, dihexyl ester, sodium salt	ACY.
Sulfosuccinic acid, diisodecyl ester, sodium salt	ACY.
Sulfosuccinic acid, diisooctyl ester, sodium salt	CCC, CIN, MOA, SOS.
Sulfosuccinic acid, dipentyl ester, sodium salt	ACY.
Sulfosuccinic acid, tridecyl ester, sodium salt	ACY, MOA.
Sulfosuccinic acid esters, all other	CIL, MOA, RH, SCP, TCH, WTC.
*ALL OTHER SULFONIC ACIDS HAVING ESTER OR ETHER LINKAGES:	
Coconut oil acids, 2-sulfoethyl ester, sodium salt	GAF, HDG, LEV.
Dodecylphenyloxidiesulfonic acid, disodium salt	CTL, POW, X.
Dodecyl sulfoacetate, sodium salt	STP.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
SURFACE-ACTIVE AGENTS	
ANIONIC--CONTINUED	
*SULFONIC ACIDS (AND SALTS THEREOF)--CONTINUED	
*SULFONIC ACIDS HAVING ESTER OR ETHER LINKAGES--CONTINUED	
*ALL OTHER SULFONIC ACIDS HAVING ESTER OR ETHER LINKAGES--CONTINUED	
glycerol monostearate sulfacetate, sodium salt--	MTC.
Iso-octylphenol, ethoxylated and sulfonated,	
sodium salt--	GAF, RH.
n-Octylphenol, ethoxylated and sulfonated,	
sodium salt--	CRT.
Sulfonic acids with ester linkages, all other--	STC.
*OTHER SULFONIC ACIDS:	PG, VPC, WTC, X.
Mixed alkane sulfonic acid, sodium salt--	AAC, DUP, QCP, X.
Petroleum sulfonic acid, water soluble (acid layer), sodium salts--	MTC.
Sulfonic acids, all other--	CLU, SEM, SIP, USR, WTC, WVA.
*SULFURIC ACID ESTERS (AND SALTS THEREOF):	
*ACIDS, AMIDES, AND ESTERS, SULFATED:	
Coconut oil acids-ethanolamine salt, sulfated,	
potassium salt--	EMK.
CARBOXYLIC ACID ESTERS (EXCEPT NATURAL FATS AND OILS), SULFATED:	
ESTERS OF SULFATED OLEIC ACID:	
*Butyl oleate, sulfated, sodium salt--	AKS, HIP, ICI, MRV, PC.
Butyl and propyl oleate, sulfated, sodium salt--	CRT, MCP.
Isobutyl oleate, sulfated, sodium salt--	DA.
Isopropyl oleate, sulfated, sodium salt--	DEX, HRT.
Methyl oleate, sulfated, sodium salt--	DUP, ICI.
*Propyl oleate, sulfated, sodium salt--	AKS, CHP, MRV.
Esters of sulfated oleic acid, all other--	ARI, CHP.
OTHER SULFATED ESTERS:	
Glycerol monoester of coconut oil acids, sulfated, sodium salt--	CP, X.
9-Octadecenyl acetate, sulfated, sodium salt--	DUP.
Sulfated esters, all other--	DA.
OTHER SULFURIC ACID ESTERS:	
*Oleic acid, sulfated, disodium salt--	ACT, CIN, DA, MCP, SCO, TEN.
Sulfuric acid esters, all other--	BFP, SCO, SLM, TEN.
*Raff oil, sulfated, sodium salt--	ACT, APX, CHP, CRT, ICI, SEA, SOS, WHW.
Carboxylic acid-alkanolamine condensates, sulfated, all other--	STC.
*ALCOHOLS, SULFATED:	
Decyl and octyl sulfate, sodium salt--	TCH.
Decyl sulfate, ammonium salt--	HLI.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANIONIC--CONTINUED		
*SULFURIC ACID ESTERS (AND SALTS THEREOF)--CONTINUED		
*ALCOHOLS, SULFATED--CONTINUED		
Decyl sulfate, sodium salt		HLI, RBC, SCP.
Dodecyl sulfate, ammonium salt		ACG, CTL, CYL, HLI, JRG, ONX, STP, TCH, TXI.
Dodecyl sulfate, diethanolamine salt		ACG, CYL, DUP, JRG, ONX, TCH.
Dodecyl sulfate, diethylamine salt		ACG, STP.
Dodecyl sulfate, N,N-diethylcyclohexylamine salt		DUP.
Dodecyl sulfate, isopropanolamine salt		JRG, TCH.
Dodecyl sulfate, magnesium salt		ACG, HLI, ONX, RCD, STP.
Dodecyl sulfate, potassium salt		PG.
Dodecyl sulfate, sodium salt		ACG, DUP, HLI, ONX, STP, TCH, WVA.
*Dodecyl sulfate, triethanolamine salt		ACG, CTL, HLI, ONX, STP, TCH, TXI.
3,9-Diethyl-6-tridecyl sulfate, sodium salt		NCC.
2-Ethylhexyl sulfate, sodium salt		ACG, BRD, NCC, SCP, TCH, WTC.
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt		NCC.
Hexadecyl sulfate, sodium salt		ACG, CTL.
Hexyl sulfate, potassium salt		DEX.
Linear alcohols, sulfated, all other		ACZ, BRD, CYL, DUP, RCD, SCP.
*Mixed linear alcohols, sulfated, ammonium salt		BRD, CP, PG, RCD, S, SCP, VAL.
*Mixed linear alcohols, sulfated, sodium salt		BRD, DUP, NTL, PG, RCD, SCP, WTC.
*Mixed linear alcohols, sulfated, triethanolamine salt		BRD, PG, RCD, SCP.
1-Octadecyl-2-naphthyl tetrahydropyrimidine		EMK, ONX, RCD.
*Octyl sulfate, sodium salt		ACG, DUP, RCD.
*Triethyl sulfate, sodium salt		ACG, DA.
*ETHERS, SULFATED:		
*ALKYLBIPHENOLS, ETHOXYLATED AND SULFATED:		
Nonylphenol, ethoxylated and sulfated, ammonium salt		GAF, STP.
Nonylphenol, ethoxylated and sulfated, sodium salt		GAF, WTC.
Nonylphenol, ethoxylated and sulfated, triethanolamine salt		ARL, WTC.
Sulfated cyclic ethers, all other		TCH.
Decyl alcohol, propoxylated and sulfated, sodium salt		APX.
*Dodecyl alcohol, ethoxylated and sulfated, ammonium salt		ACG, CTL, HLI, MOA, ONX, STP.
*Dodecyl alcohol, ethoxylated and sulfated, sodium salt		ACG, CTL, CYL, HLI, ONX, SCP, STP, TCH.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ANIONIC--CONTINUED		
*SULFURIC ACID ESTERS (AND SALTS THEREOF)--CONTINUED		
*ETHERS, SULFATED--CONTINUED		
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, ammonium salt		HLI, LEV.
Hexyl alcohol, propoxylated and sulfated, sodium salt		APX.
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt		AAC, BRD, CO, PG, PII, RCD, SCP, SHC, STP, MTC, X.
*Mixed linear alcohols, ethoxylated and sulfated, sodium salt		AAC, BRD, CO, DA, DUP, GAR, PG, PII, RCD, SCP, STP, TCI, TX, MTC, WVA.
Tridecyl alcohol, ethoxylated and sulfated, sodium salt		AAC, ARL, ONX.
Sulfated ethers, all other		MOA, SCP.
NATURAL FATS AND OILS, SULFATED:		
*Castor oil, sulfated, sodium salt		ACT, ACY, AVS, APY, ARI, ARL, CRT, DA, DEX, FTX, HIP, HRT, ICT, LEA, LUR, MRV, SCO, SCP, SEA, SLM, WHW.
Coconut oil, sulfated, sodium salt		ACY, DA, MRD.
*Cod oil, sulfated, sodium salt		ARI, CIN, SEA, WHI, WHW.
Greases, other than wool, sulfated, sodium salt		WHI.
*Wooling oil, sulfated, sodium salt		ARI, SEA, SLM, WHW.
*Hard, sulfated, sodium salt		MRD, WHW.
*Mixed fish oils, sulfated, sodium salt		ACT, DA, MRD, SLM, WHW.
Mixed vegetable oils, sulfated, sodium salt		CIN, LUR.
*Mustard seed oil, sulfated, sodium salt		DA.
*Neat's foot oil, sulfated, sodium salt		ACT, ARI, CIN, MRD, SLM, WHI.
Peanut oil, sulfated, sodium salt		CRT.
*Soybean oil, sulfated, sodium salt		ACT, SEA, WHW.
Sperm oil, sulfated, sodium salt		ARI.
Sulfated animal fats and oils, all other		WHI.
*Tallow, sulfated, sodium salt		ACT, ACY, ARI, CCC, DA, ECC, LUR, MRD, PC, SID, SLM, SOS, WHI.
Vegetable oils, sulfated, all other		ARI, AZS, SCM.
OTHER ANIONIC SURFACE-ACTIVE AGENTS:		
Lignin, sodium salt		WVA.
Mixed linear olefin sulfonate		X.
Polyethylene-vinyl alcohol copolymer, potassium salt		X.
Tridecyl alcohol, ethoxylated and carbonated, sodium salt		S.
Anionic surface-active agents, all other		CJO, CMT, DAN, MIL, MIR, S, SLM.



TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC	
*AMINE OXIDES AND OXYGEN-CONTAINING AMINES (EXCEPT THOSE HAVING AMIDE LINKAGES):	
*CYCLIC:	
N,N-Bis(2-hydroxyethyl)octadecylamine	ARC, HXL
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	ARC
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	ARC, SHX, SVC, TCH, X
*Coconut oil alkylamine, ethoxylated	HLI, JOR, PG
N,N-Dimethyl dodecylamine oxide	ARC, ONK
N,N-Dimethylhexadecylamine oxide	ARC, ONK
Ethylenediamine, propoxylated	DUP
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl)-ethylenediamine	MTC, X
(Mixed alkyl)amine, ethoxylated	ICI, RH, X
(9-Octadecenyl)amine, ethoxylated	ARC, GAF, MET, TCH
Octadecylamine, ethoxylated	ARC, TCH
(Soybean oil alkyl)amine, ethoxylated	ARC, SHX, SVC
* (Tallow alkyl)amine, ethoxylated	ARC, DA, DUP, GAF, MRV, S, SHX, TCH
N-(Tallow alkyl)trimethylenediamine, ethoxylated	ARC
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	X
Triethanolamine, ethoxylated	MIL
Amine oxides and oxygen-containing amines (Except those with amide linkages), acyclic, all other	ARC, AZS, BAK, BRD, CGY, KPI, MOA, PG, S, SBC, SCP, SDH, SVC, TCH, TX
*CYCLIC:	
N-Hexadecylmorpholine	BRD
1-(2-Hydroxyethyl)-2-heptadecyl-2-imidazoline	MOA
* 1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	DA, HIR, SGP, SHX
* 1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2-imidazoline	CGY, MOA, TCH
* 1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	HDC, MOA, X
1-(2-Hydroxyethyl)-2-tridecyl-2-imidazoline	CGY
Hydrochloride	MVA
Lignin amines	BAK
Rosin amines, ethoxylated	ARC, BAK, CGY, HFC, MOA, STC, X
Amine oxides and oxygen-containing amines (Except those having amide linkages), cyclic, all other	ARC, BAK, CGY, HFC, MOA, STC, X
*AMINES AND AMINE OXIDES HAVING IMIDE LINKAGES:	
CARBOXYLIC ACID - DIAMINE AND POLYAMINE CONDENSATES:	
Carboxylic acid-diamine and polyamine condensates, all other	GAF, GDC, ICI, S, SBC, STC, MVA, X
Coconut oil acids-N,N-dimethyltrimethylenediamine condensate	CYL, SCP



TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC--CONTINUED	
*AMINES AND AMINE OXIDES HAVING AMIDE LINKAGES--CONTINUED:	
CARBOXYLIC ACID - DIAMINE AND POLYAMINE CONDENSATES--CONTINUED:	
Mixed fatty acids-polyalkylenepolyamine condensate	QCP, TCH.
Oleic acid-diethylenetriamine condensate	ICI, TCH.
Oleic acid-N,N-dimethyltrimethylenediamine condensate	CCM.
Oleic acid-ethylenediamine condensate, monoethoxylated	DEX, SOC.
Palm oil acids-ethylenediamine condensate, monoethoxylated	DA.
Pelargonic acid-tetraethylenepentamine condensate	FER, ICI.
*Stearic acid-diethylenetriamine condensate	ARI, JOR, S.
Stearic acid-diethylenetriamine condensate, polyethoxylated	APX.
Stearic acid-ethylenediamine condensate, monoethoxylated	DEX, ICI, MRV, SLC.
Stearic acid-tetraethylenepentamine condensate	ONX, X.
Tall oil acids-diethylenetriamine condensate	ARI, AZS, SCP, STC, X.
*Tall oil acids-polyalkylenepolyamine condensate	ARS, BRD, MCH, QCP, SCP, MVA, X.
Carboxylic acid-diamine and polyamine condensates, alkoxylated, all other	BAK, CLD, GAF, GDC, MIR.
OTHER AMINES AND AMINE OXIDES HAVING AMIDE LINKAGES:	
2-Lauroamido-N,N-dimethylpropylamine oxide sulfate	HLI, ONX, SMU.
Amines and amine oxides having amide linkages, all other	DUP.
*AMINES, NOT CONTAINING OXYGEN (AND SALTS THEREOF):	
AMINE SALTS:	
(Coconut oil alkyl)amine acetate	ARC.
(Hydrogenated tallow alkyl)amine acetate	ARC.
Octadecylamine acetate	ARC, BAK, SHX.
(Tallow alkyl)amine acetate	ARC.
N-(Tallow alkyl)trimethylenediamine acetate	ARC.
N-(Tallow alkyl)trimethylenediamine oleate	ARC, JTO.
Amine salts (Not containing oxygen), all other	ARC, TCC.
DIAMINES AND POLYAMINES:	
*IMIDAZOLINE DERIVATIVES:	
1-(2-Aminoethyl)-2-nor(tall oil alkyl)-2-imidazoline	SCP.
N-(Decosyl and eicosyl)trimethylenediamine	EMO.
2-Heptadecyl-2-imidazoline	CGY, SCO.
N-(Coconut oil alkyl)trimethylenediamine	ARC, JTO.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC--CONTINUED	
AMINES, NOT CONTAINING OXYGEN (AND SALTS THEREOF)--CONTINUED	
DIAMINES AND POLYAMINES--CONTINUED	
N-(Mixed alkyl)polyethylenepolyamine	CCM.
N-(9-Octadecenyl)trimethylenediamine	ARC, JTO, SCP, SHX.
N-(Soybean oil alkyl)trimethylenediamine	ENO.
N-(Tallow - alkyl)dipropylenetriamine	ARC, JOR, JTO.
N-(Tallow alkyl)trimethylenediamine	ARC, JTO, MCM, SHX.
Diamines and polyamines, all other	ARC, ENO, ICI, JOR, NCM, STC, X, X.
PRIMARY MONOAMINES:	
(Coconut oil alkyl)amine	ARC, ENO, JTO, SHX.
(Decosyl and eicosyl)amine	ENO.
Dodecylamine	ARC, SHX.
Hexadecylamine	ARC, ENO.
(Hydrogenated tallow alkyl)amine	ARC, ENO, JTO, SHX.
*9-Octadecenylamine	ARC, ENO, JTO, SHX.
*Octadecylamine	ARC, ENO, SHX.
(Soybean oil alkyl)amine	ARC, ENO, JTO.
(Tall oil alkyl)amine	NCM, SHX.
*(Tallow alkyl)amine	ARC, ENO, JTO, SHX.
Primary monoamines, all other	ARC, ENO.
SECONDARY AND TERTIARY MONOAMINES:	
Bis(coconut oil alkyl)amine	ARC.
Bis(hydrogenated tallow alkyl)amine	ARC, SHX.
*N,N-Dimethyl(coconut oil alkyl)amine	ARC, ARC, BRD, ENO.
N,N-Dimethyl(dodecylamine)	ARC, BRD.
*N,N-Dimethylhexadecylamine	ARC, BRD, SHX.
N,N-Dimethyl(hydrogenated tallow alkyl)amine	ARC.
N,N-Dimethyl(mixed alkyl)amine	ONX, TMA.
N,N-Dimethyl-9-octadecenylamine	ENO.
*N,N-Dimethyloctadecylamine	ARC, BRD, ENO, SHX.
N,N-Dimethyl(soybean oil alkyl)amine	ARC, ENO.
N,N-Dimethyltetradecylamine	ARC.
N-Methylbis(coconut oil alkyl)amine	ARC, SHX.
N-Methylbis(hydrogenated tallow alkyl)amine	ARC, ENO, SHX.
Triisodecylamine	SCP.
Trilaurylamine	SCP.
Trioctylamine	SCP.
Secondary and tertiary monoamines, all other	ARC, AZS, BRD, ENO, JTO, PEL.
OXYGEN-CONTAINING QUATERNARY AMMONIUM SALTS:	
Benzyl(coconut oil alkyl)bis(2-hydroxyethyl)- ammonium chloride	X.
Benzyl(coconut oil alkyl, ethoxylated)- dimethylammonium chloride	DUP, SCP.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC--CONTINUED	
OXYGEN-CONTAINING QUATERNARY AMMONIUM SALTS--CONTINUED	
Benzyl(tallow alkyl)bis(2-hydroxyethyl)ammonium chloride	DUP.
Bis(2-hydroxyethyl, ethoxylated)methyl(9-octadecenyl)-ammonium chloride	ARC, GAF.
Bis(2-hydroxyethyl, ethoxylated)-methyloctadecylammonium chloride	ARC, SVC.
(Coconut oil alkyl)bis(2-hydroxyethyl, ethoxylated)-methylammonium chloride	ARC, GAF.
(Ethoxybenzyl)dimethyl(octylphenoxy)ammonium chloride	RH.
(Ethoxybenzyl)dimethyl(octyltoloxo)ammonium chloride	RH.
1-Ethyl-2-(8-heptadecenyl)-1-(2-hydroxyethyl)-2-imidazolium ethyl sulfate	ICI, SBC.
N-Ethyl-N-hexadecylmorpholinium ethyl sulfate	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	MTC.
1-Methyl-2-(2-stearoyloxyethyl)carbamoylpyridinium chloride	MTC.
Oxygen-containing quaternary ammonium salts (except those having amide linkages), all other	ARC, BAK, DA, ICI, MLR, MOA, SBC, TCH, X.
Quaternary ammonium salts having amide linkages, all other	BAK, BRD, SHX, SNM, SVC, VND.
QUATERNARY AMMONIUM SALTS, NOT CONTAINING OXYGEN:	
ACYLIC:	
Bis(coconut oil alkyl)dimethylammonium chloride	ARC, ENO, ONX, SCP, SHX.
*Bis(hydrogenated tallow alkyl)dimethylammonium chloride	ARC, ENO, SHX, SVC, WTC.
Bis(hydrogenated tallow alkyl)-dimeethylammoniummethyl sulfate	ARC, SVC.
(Coconut oil alkyl)trimethylammonium chloride	ARC, JTO, ONX.
Didecyltrimethylammonium chloride	RHT.
Dimethyldioctadecylammonium chloride	SHX.
Dodecyltrimethylammonium chloride	ARC.

TABLE 2. --SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER.  
1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC--CONTINUED	
QUATERNARY AMMONIUM SALTS, NOT CONTAINING OXYGEN--CONTINUED	
ACYCLIC--CONTINUED	
Ethylidimethyl(mixed alkyl)ammonium ethyl sulfate	DEX, JOR.
Ethylidimethyl(9-octadecenyl)ammonium bromide	ONX.
Ethylhexadecyldimethylammonium bromide	HXL
Hexadecyltrimethylammonium bromide	HXL
Hexadecyltrimethylammonium chloride	ARC
Hexadecyltrimethylammonium P-toluenesulfonate	HXL
(Hydrogenated tallow alkyl)trimethylammonium chloride	ARC
Methyltrioctylammonium chloride	SCP, SHX.
(Mixed linear alkyl)trimethyl ammonium bromide	DUP.
N,N',N'',N'''-pentamethyl-N-(tallow alkyl)-trimethylene-bis(ammonium chloride)	ARC, JTO.
Trimethyloctadecylammonium chloride	ARC
Trimethyl(soybean oil alkyl)ammonium chloride	ARC, JTO.
* Trimethyl(tallow alkyl)ammonium chloride	ARC, ENO, JTO, SHX.
* Trimethyltetradecylammonium bromide	HXL
Quaternary ammonium salts, not containing oxygen, cyclic, all other	ARC, CRD, ENO, ONX, RSA, X.
BENZENOID	
* Benzyl(coconut oil alkyl)dimethylammonium chloride	ARC, CCL, CRT, ENO, GDC, SCP, TCC.
* Benzylidimethyl(mixed alkyl)ammonium chloride	BKM, BRD, HNT, HXL, ONX, RH, SDH, TCC.
* Benzylidimethyl(octadecyl)ammonium chloride	AAC, BRD, CRD, HLI, HXL, ONX, RH, SCP, TMI.
Benzylidimethyl(tallow alkyl)ammonium chloride	ENO.
Benzylidimethyl(tetradecyl)ammonium chloride	HXL, ONX, X.
Benzylidodecyltrimethylammonium chloride	ONX.
Benzylhexadecyltrimethylammonium chloride	ARC, ENO.
Benzyl(hydrogenated tallow alkyl)dimethylammonium chloride	HXL, SHX, TCC.
1-Benzyl-2-picolinium bromide	CIN, CRT, HTP, HXL, SHX, TCC.
* Benzyltrimethylammonium chloride	ONX.
(Dodecylbenzyl)triethylammonium chloride	ONX.
2-Dodecylisocouinolium bromide	RH, TCC.
(Dodecylmethylbenzyl)trimethylammonium chloride	RH, TCC.
1-Dodecylpyridinium chloride	CCL, DAN.
(Ethylbenzyl)dimethyl(mixed alkyl)ammonium chloride	HNT.
1-Phenethyl-2-picolinium bromide	HXL.
Quaternary ammonium salts not containing oxygen, cyclic, all other	AKS, ARC, BAK, BRD, DEX, ENO, GDC, HXL, ICI, MIL, ONX, X.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CATIONIC--CONTINUED	
OTHER CATIONIC SURFACE-ACTIVE AGENTS:	
Tallow amine, ethoxylated and propoxylated, methyl sulfate--	DUP.
Tallow amine, ethoxylated, quarternary ammonium salt--	DUP.
Cationic surface-active agents, all other--	BAK, HXL, MIR, SCP, WTC.
NONIONIC	
CARBOXYLIC ACID AMIDES:	
(AMINE/ACID RATIO = 2/1):	
Capric acid (Ratio = 2/1)--	CLI, FTX, NTL.
Castor oil acids (Ratio = 2/1)--	AKS, ARL, BRD, CCL, CIN, CLI, CON, CPC, CRD, CTL, CYL, *Coconut oil acids (Ratio = 2/1)--
	MOA, MRV, ONX, PC, PEK, PMX, RCD, SBC, SCP, SHX, SOP, STP, TCH, VAL, WTC, X.
Coconut oil and tallow acids (Ratio = 2/1)--	CLI, CRF, CIL, ESS, MOA, SEC, SVC, UNN.
*Lauric acid (Ratio = 2/1)--	CLI, CAD, CIL, CIL, TCH.
*Lauric and myristic acids (Ratio = 2/1)--	CRD, HRT, MOA, PG, RCD, SBC, STP.
Linoleic acid (Ratio = 2/1)--	KHP, MOA, VND.
*Oleic acid (Ratio = 2/1)--	CLI, ENR, HRT, SBC, STP, TMH.
Pelargonic acid (Ratio = 2/1)--	TCH.
Stearic acid (Ratio = 2/1)--	CLI, CIL, RCD, VAL.
*Tall oil acids (Ratio = 2/1)--	ECC, FER, MOA, WTC, WVA.
Tallow acids (Ratio = 2/1)--	CLI, FER, MOA.
Dithanolamine condensates (Amine/acid = 2/1), all other--	CLD, FER, MOA, SCP, SOS.
OTHER AMINE/ACID RATIOS:	
*Coconut oil acids (Ratio = 1/1)--	BRD, CGY, CLI, CTL, CYL, DA, EMK, FTX, GAF, HLI, HNT, HTM, JOR, JRG, MOA, ONX, PIL, SRC, SCP, STP, TCC, WTC.
*Lauric acid (Ratio = 1/1)--	BRD, CIL, CYL, MOA, ONX, SBC, TNI.
*Lauric and myristic acids (Ratio = 1/1)--	BRD, CLI, CPC, CYL, HLI, HTM, PG, SBC.
*Linoleic acid (Ratio = 1/1)--	CLI, CYL, DA, MOA, SBC, TCH, VND.
Oleic acid (Ratio = 1/1)--	HLI, SBC.
Palmitic and stearic acids (Ratio = 1/1)--	VFC.
Soybean oil acids (Ratio=1/1)--	MOA.
*Stearic acid (Ratio = 1/1)--	ECC, FTX, HIP, MRV.
Tallow acids--	TCH, VFC.
Dithanolamine condensates, amine/acid ratio=1/1, all other--	CLI, MOA, SBC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC--CONTINUED	
CARBOXYLIC ACID AMIDES--CONTINUED	
ALL OTHER CARBOXYLIC ACID AMIDES:	
Alkanolamine condensates, all other--	CLD, SBC, TCH, VND.
Carboxylic acid-alkanolamine condensate, alkoxylated, all other--	ROB.
Coconut oil acids (Specify amine/acid ratio)	STP.
Coconut oil acids (Ratio = 1/1)	CYL, MOA, PG, VND, WTC.
Coconut oil acids (Ratio = 2/1)	STP, TCH.
Coconut oil acids, other code--	CCC.
Coconut oil acids-N,N-dimethyltrimethylene-diamine condensate(amine/acid ratio=1/2)	JRG.
Coconut oil acids-ethanolamine condensate, ethoxylated--	BRD, STP.
Diethanolamine condensate, all other--	EFH.
Ethanolamine condensates, amine/acid ratio = 1/1, all other--	CYL, GAF, TCH, VND.
Ethanolamine condensates, amine/acid ratio = 2/1, all other--	MOA.
Isopropanolamine condensates, all other--	CRN, SBC, MTC.
Lauric acid (Specify amine/acid ratio)	CLI, HIN, MOA.
Lauric acid myristic acids (Ratio = 1/1)	HLI, MOA, SCP.
Oleic acid-ethanolamine condensate, ethoxylated	ONX.
Oleic acid-methanolamine condensate, ethoxylated	ARC.
Stearic acid (Ratio = 1/1)	MOA, VND, WTC.
Stearic acid (Ratio = 1/2)	HAL, WTC.
Stearic acid-ethylenediamine condensate	AKS, CLI, ECC.
Stearic acid-ethylenediamine condensate amine/acid ratio=1/2	TCH.
Carboxylic acid amides, all other--	BAK, BKM, MOA, WTC, X.
CARBOXYLIC ACID ESTERS:	
ANHYDROSORBITOL ESTERS:	
Anhydrosorbitol dioleate--	ICI.
Anhydrosorbitol monooleate--	BRD, GLY, ICI, TCH.
* Anhydrosorbitol mono-oleate--	BRD, GLY, HDG, ICI, TCH.
Anhydrosorbitol monopalmitate--	ICI, TCH.
Anhydrosorbitol monostearate--	GLY, HDG, ICI, TCH.
Anhydrosorbitol sesquioleate--	GLY, TCH.
Anhydrosorbitol triester of tall oil acids--	GLY.
Anhydrosorbitol trioleate--	GLY, ICI, TCH.
Anhydrosorbitol tristearate--	GLY, ICI.
Anhydrosorbitol esters, all other--	BRD, ICI, TCH.
DIETHYLENE GLYCOL ESTERS:	
Diethylene glycol distearate--	ARC, GLY, VAL.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC--CONTINUED	
CARBOXYLIC ACID ESTERS--CONTINUED	
DIETHYLENE GLYCOL ESTERS--CONTINUED	
*Diethylene glycol monoester of coconut oil acids	: DA, MTC.
*Diethylene glycol monooleate	: ECC, GLY, HDG.
*Diethylene glycol mono-oleate	: ARC, HAL, VND.
*Diethylene glycol monocinolate	: DA.
*Diethylene glycol monostearate	: ARC, CLI, ECC, VND.
*Diethylene glycol sesquisteer of tall oil acids	: ECC.
Diethylene glycol sesquisteerate	: GLI.
Diethylene glycol sesquisteerate	: WIC.
Diethylene glycol esters, all other	: BKH, WVA.
ETHOXYLATED ANHYDROSORBITOL ESTERS:	
Ethoxylated anhydrosorbitol monooleate	: BRD, GLY, ICI, SVC, TCH.
*Ethoxylated anhydrosorbitol mono-oleate	: BRD, EMR, GLY, HDG, ICI, TCH.
Ethoxylated anhydrosorbitol monopalmitate	: ICI, SVC.
Ethoxylated anhydrosorbitol monostearate	: GLY, HDG, ICI, TCH.
Ethoxylated anhydrosorbitol monotallate	: TCH.
Ethoxylated anhydrosorbitol triester of tall oil acids	: GLY, ICI.
Ethoxylated anhydrosorbitol trioleate	: GLY, HDG, ICI, TCH.
Ethoxylated anhydrosorbitol tristearate	: GLY, ICI, TCH.
Ethoxylated anhydrosorbitol esters, all other	: GLY.
ETHOXYLATED SORBITOL ESTERS:	
Ethoxylated sorbitol beeswax ester	: ICI.
Ethoxylated sorbitol esters, all other	: BAK, ICI.
Ethoxylated sorbitol hexaester of tall oil acids	: TCH.
Ethoxylated sorbitol hexaoleate	: ICI, TCH.
Ethoxylated sorbitol lanolin ester	: ICI.
Ethoxylated sorbitol mono-oleate	: ICI, TCH.
Ethoxylated sorbitol pentaoleate	: ICI.
Ethoxylated sorbitol tetraester of lauric and oleic acids	: ICI.
Ethoxylated sorbitol tetraester of tall oil acids	: WIC.
Ethoxylated sorbitol tetraoleate	: ICI, MET.
ETHYLENE GLYCOL ESTERS:	
*Ethylene glycol distearate	: CYL, EMR, HAL, ICI, TCH, WM, MTC.
Ethylene glycol mono-oleate	: CGX, EFH.
*Ethylene glycol monostearate	: ARC, CLI, CYL, HAL, HDG, KNP, TCH, VND, WM.
GLYCEROL ESTERS:	
COMPLEX GLYCEROL ESTERS:	
Glycerol diacetylitartrate monostearate	: EKT.
Glycerol monoester of mixed fatty acids, acetylated	: EKT.



TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC--CONTINUED	
CARBOXYLIC ACID ESTERS--CONTINUED	
GLYCEROL ESTERS--CONTINUED	
COMPLEX GLYCEROL ESTERS--CONTINUED	
Glycerol monoester of mixed fatty acids,	
succinylated	EKT.
Glycerol mono-oleate, acetylated	TCH.
Complex glycerol esters, all other	GLY, SCP.
GLYCEROL ESTERS OF CHEMICALLY DEFINED ACIDS:	
Glycerol dilaurate	VND.
Glycerol distearate	ARC.
Glycerol monooleate	ARC.
Glycerol monocaprylate	GLY.
Glycerol monooleate	GLY, HAL, HDG.
*Glycerol mono-oleate	ARC, EFH, EMR, GLY, GRO, HAL, HDG, TCH, WTC.
*Glycerol monolinoleate	GLY, HDG, NTL.
*Glycerol monostearate	ARC, ARI, BIS, CCC, CHL, CIN, CLD, CPC, EMR, GLY, GRO, HAL, HET, IUR, SOS, TCH, VND, WM, WTC.
Glycerol esters of chemically defined acids, all other	HDG, SVC.
GLYCEROL ESTERS OF MIXED ACIDS:	
Glycerol monoester of coconut oil acids	GLY.
Glycerol monoester of cottonseed oil acids	EKT.
Glycerol monoester of hydrogenated cottonseed oil acids	EKT, LEV, MM.
Glycerol monoester of hydrogenated soybean oil acids	BFP, CYL, EKT, SVC, WTC.
Glycerol monoester of lard acids	EKT.
Glycerol monoester of mixed vegetable oil acid	EKT, LEV.
Glycerol monoester of palm oil acids	EKT.
Glycerol monoester of tallflower oil acids	EKT.
Glycerol monoester of tall oil acids	FER, WTC.
Glycerol esters of mixed acids, all other	BFP, EKT, HDG, ICI, SLM, WTC.
NATURAL FATS AND OILS, ETHOXYLATED:	
*Castor oil, ethoxylated	BRD, DA, GAF, HTX, ICI, MIL, NTL, STC, SVC, TCH, TMH, WTC, X.
*Hydrogenated castor oil, ethoxylated	DA, ICI, MET, MIL, TCH.
*Nanolin, ethoxylated	ARC, CRD, CHN, TCH.
Natural fats and oils, ethoxylated, all other	DA, GAF, MIL, SVC, TCH.
POLYETHYLENE GLYCOL ESTERS:	
POLYETHYLENE GLYCOL ESTERS OF CHEMICALLY DEFINED ACIDS:	
*Polyethylene glycol dilaurate	ARC, CYL, DA, GLY, HDG, TCH, MM.
*Polyethylene glycol dioleate	ARC, GY, CLD, DA, EFH, GLY, HAL, MIL, TCH.
*Polyethylene glycol distearate	ARC, CHP, CYL, CYL, HDG, SBC, TCH.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC--CONTINUED	
CARBOXYLIC ACID ESTERS--CONTINUED	
POLYETHYLENE GLYCOL ESTERS--CONTINUED	
POLYETHYLENE GLYCOL ESTERS OF CHEMICALLY DEFINED ACIDS--CONTINUED	
* Polyethylene glycol monolaurate-	ARC, GCA, CGY, CLD, DA, ECC, GLY, HAL, ICI, TCH, VND, WM.
* Polyethylene glycol mono-oleate-	ARC, BRD, CCA, CCC, CLD, CPC, CRT, DA, DEX, ECC, EFH, GAF, GDC, GLY, HAL, HDG, ICI, MET, MRT, MRV, ONX, SVC, SVC, TCH, WM, WTC.
Polyethylene glycol monopalmitate-	GLY, KNP.
* Polyethylene glycol monostearate-	AKS, ARC, ART, ARL, CHP, CRT, DA, EFH, GAF, GDC, GLY, HRT, ICI, MCP, SLC, SOS, SVC, TCH, VND, WTC. CCC, TCH, WTC.
Polyethylene glycol sesquinoate-	CCA, HDG, ICI, TCH.
Polyethylene glycol esters of chemically defined acids, all other	CCC, EFH, X.
POLYETHYLENE GLYCOL ESTERS OF MIXED ACIDS:	
Polyethylene glycol diester of tall oil acids	GLY.
Polyethylene glycol monoester of soybean oil acids-	GLY.
Polyethylene glycol monoester of tall oil acids	X.
Polyethylene glycol monoester of tall oil acids, ethoxylated	AKS, MRT.
Polyethylene glycol sesquiester of coconut oil acids-	MVA.
Polyethylene glycol sesquiester of rosin acids	AKS, MRT.
* Polyethylene glycol sesquiester of tall oil acids-	AKS, ICI, SLM, WTC, WVA.
Polyethylene glycol esters of mixed acids, all other-	ARC, BKM, ECC, EFH, FER, GAF, ICI, SOS, STC, TCH.
POLYGLYCEROL ESTERS:	
Polyglycerol distearate-	GLY, SVC.
Polyglycerol mono-oleate	HDG, WTC.
Polyglycerol monostearate-	GLY, WTC.
Polyglycerol esters, all other	GLY, SVC, TCH, WTC.
PROPANEDIOL ESTERS:	
1,2-Propanediol monolaurate-	ARC, SBC.
1,2-Propanediol mono-oleate	EFH.
1,2-Propanediol monostearate	ARC, EKT, GLY, HAL, SBC, TCH, WM.
Propanediol esters, all other	ARC.
OTHER CARBOXYLIC ACID ESTERS:	
Di-isobutylene maleate	RH.
Ethoxylated 1,2-propanediol monostearate	ICI.
Lauric acid ester of glycerol and ethoxylated nonylphenol-	TCC.
Methylglucoside laurate-	HDG.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC--CONTINUED	
CARBOXYLIC ACID ESTERS--CONTINUED	
OTHER CARBOXYLIC ACID ESTERS--CONTINUED	
Polyalkylene glycol adipate	X.
Carboxylic acid esters, all other	AAC, BAK, CHP, CLD, CRN, DUP, EHR, HAL, HDG, MOA, PEL, PG, ROB, STC, SVC, SYL, TCH, VND, X.
ETHERS:	
BENZENOID ETHERS:	
Alkylphenol-formaldehyde condensates, alkoxylated, all other	X.
* Dinonylphenol, ethoxylated	BRD, CPC, GAF, HTN, RH, TCH, WTC.
* Dodecylphenol, ethoxylated	DA, GAF, MON, OMC, STC, TCH, TMH.
Iso-octylphenol, ethoxylated	AAC, DA, GAF, RH, TMH.
(Mixed alkyl)phenol, ethoxylated	MIL, MTL, X.
(Mixed alkyl)phenol, ethoxylated, butyl ether	RH.
(Mixed alkyl)phenol-formaldehyde	MTL, WTC, X.
(Mixed alkyl)phenoxypoly(ethyleneoxy)ethyl chloride	GAF.
* Nonylphenol, ethoxylated	ARC, BRD, CPC, DA, GAF, HDG, HTN, ICI, MET, MIL, MON, MRV, OMC, RH, S, STC, SFP, TCH, TMH, TX, UCC, WTC, WVA, X.
Nonylphenol, ethoxylated and propoxylated	GAF, RH.
Nonylphenol-formaldehyde, alkoxylated	WTC, X.
n-Octylphenol, ethoxylated	TCH.
tert-Octylphenol-formaldehyde, ethoxylated	DA, SDM.
* Phenol, ethoxylated	BRD, DA, GAF, ICI, MIL, STC, TCH.
Tetradecylphenol ethoxylated	ORO.
Tridecylphenol, ethoxylated	TCH.
Phenols, ethoxylated, all other	DA, PEL, RH, STC, SVC, X.
NONBENZENOID ETHERS:	
LINEAR ALCOHOLS, ALKOXYLATED:	
*Decyl alcohol, ethoxylated	GAF, ICI, MET, MIL, MRV, STC, TCH.
Decylpoly(ethyleneoxy)ethyl chloride	GAF.
*Dodecyl alcohol, ethoxylated	AAC, HDG, ICI, MET, MIL.
Hexadecyl alcohol, ethoxylated	ICI, TCH.
*9-Octadecenyl alcohol, ethoxylated	AAC, GAF, ICI, TCH.
Cetadecyl alcohol, ethoxylated	DUP, GAF, ICI.
*Olel alcohol, ethoxylated	CRD, CRN, HDG, HTN, STC.
Wool wax alcohols, ethoxylated	CRD.
Chemically defined linear alcohol, alkoxylated, all other	GAF, ICI, MIL, WTC.
Coconut oil alcohol, ethoxylated	GAF, GLY, STC, TX.
Decyl and octyl alcohols, ethoxylated	BRD, GAF.
*Mixed linear alcohols, ethoxylated	BRD, CO, DA, DUP, GAF, HDG, ICI, MIL, PG, RH, S, SHC.

TABLE 2.--SURFACE-ACTIVE AGENTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

SURFACE-ACTIVE AGENTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
NONIONIC--CONTINUED	
ETHERS--CONTINUED	
NONBENZENE ETHERS--CONTINUED	
*Mixed linear alcohols, ethoxylated and propoxylated	SHX, STC, STP, SVC, TCH, TX, UCC, WTC, X.
*Tallow alcohol, ethoxylated	BAS, DUP, GAF, MIL, OMC, PG, S, STP, SVC, TCH, TX.
Mixed linear alcohols, alkoxylated, all other	UCC, WTC, WVA.
OTHER ETHERS AND THIOETHERS:	AAC, PG, STC, TX.
tert-Dodecyl mercaptan, ethoxylated	CRN, DA, GLY, TCH, X.
Isodecyl alcohol, ethoxylated	AAC, GAF, MET.
Iso-octyl alcohol, ethoxylated	MET, S, TCH.
*Mixed alcohols, ethoxylated	DA.
Poly(mixed ethylene, propylene)glycol	CRN, MIL, RH, X.
Polyoxalkylene glycols, alkoxylated	BAS, DA, UCC, X.
Polypropylene glycol, ethoxylated	X.
2, 4, 7-Tetramethyl-5-decyne-4,7-diol, ethoxylated	WTC.
*Tridecyl alcohol, ethoxylated	TCH.
Tridecyl alcohol, propoxylated and ethoxylated	AAC, BRD, DUP, GAF, HTN, ICI, MIL, OMC, S, STC, TCH, TX, WTC, X.
Trimethylheptanol, ethoxylated	TX.
Trimethylnonyl alcohol, ethoxylated	TCH.
Trimethylpropylene alcohol, ethoxylated	TCH, UCC.
Ethers and thioethers, all other	BAS, MTC.
OTHER NONIONIC SURFACE-ACTIVE AGENTS:	AAC, ARC, DA, GAF, ICI, MIL, RH, S, SVC, TCH.
Octyl phosphate, ethoxylated	DUP.
Tri(castor oil alkyl)phosphate	GLY.
Trimethylalpropane, ethoxylated	DUP.
Nonionic surface-active agents, all other	CRN, EHR, KPI, MIL, PEL, PG, RH, TCH, X.

TABLE 3.--SURFACE-ACTIVE AGENTS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of surface-active agents to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
AAC	: Alcolac, Inc.	EK	: Eastman Kodak Co., Tennessee Eastman Co.
ACT	: Southland Corp., Chemical Div.		: Div.
ACY	: American Cyanamid Co.	EMK	: Emkay Chemical Co.
AES	: Penetone Corp.	EMR	: Emery Industries, Inc.
AGP	: Armour-Dial, Inc.	ENO	: Enenco, Inc.
AKS	: Arkansas Co., Inc.	ESS	: Essential Chemicals Corp.
APX	: Apex Chemical Co., Inc.		:
ARC	: Armak Co., Industrial Chemical Div.	FER	: Ferro Corp., Keil Chemical Div.
ARI	: Atlas Refining, Inc.	FPC	: Flambeau Paper Corp.
ARL	: Arol Chemical Products Co.	FTX	: Finetex, Inc.
ARZ	: Arizona Chemical Co.		:
ASY	: American Synthetic Rubber Corp.	GAF	: GAF Corp.
AZS	: AZS Corp.:	GDC	: Gresto, Inc.
	: AZ Products Co. Div.	GLY	: Glyco, Inc.
	: AZS Chemical Co.	GRL	: Chemed Corp., Vestal Laboratories Div.
	:	GRO	: A. Gross & Co., Millmaster Onyx Group,
	:		: Kewanee Industries, Inc.
BAK	: Baker International - Magna Corp.		:
BAS	: BASF Wyandotte Corp.	HAL	: C.P. Hall Co.
BFP	: Breddo Food Products Corp., Inc.	HDC	: Hodag Chemical Corp.
BKM	: Buckman Laboratories, Inc.	HEW	: Hewitt Soap Co., Inc.
BLA	: Astor Products, Inc., Blue Arrow Div.	HIP	: High Point Chemical Corp.
BLS	: Life Savers, Inc.	HLI	: Onyx Chemical Co.
BRD	: Lonza, Inc.	HMP	: W.R. Grace & Co., Organic Chemicals Div.
BSW	: Original Bradford Soap Works, Inc.	HNT	: Huntington Laboratories, Inc.
	:	HPC	: Hercules, Inc.
CCA	: Interstab Chemicals, Inc.	HRT	: Hart Products Corp.
CCC	: C.N.C. Chemical Corp.	HTN	: Heterene Chemical Co., Inc.
CCL	: Catawba-Charlab, Inc.	HXL	: Hexcel Corp., Hexcel Chemical Products
CCW	: Carstab Corp.		:
CGY	: Ciba-Geigy Corp.	ICI	: ICI Americas Inc., Chemical Specialties
CHL	: Chemol, Inc.		: Co.
CHP	: C.H. Patrick & Co., Inc.		:
CIN	: Stockhausen, Inc.	JOR	: Jordan Chemical Co.
CJO	: C. J. Osborn Chemicals, Inc.	JRG	: Andrew Jergens Co.
CLD	: Colloids, Inc.	JTO	: Jetco Chemicals, Inc.
CLI	: Clintwood Chemical Co.		:
CLU	: Core-Lube, Inc.	KNP	: Knapp Products, Inc.
CMT	: Chemithon Corp.	KPI	: Kenrich Petrochemicals, Inc.
CO	: Conoco, Inc.		:
CON	: Concord Chemical Co., Inc.	LEA	: Leatex Chemical Co.
CP	: Colgate-Palmolive Co.	LEV	: Lever Brothers Co.
CPC	: Grant Chemical Co.	LKY	: Lake States Div. of Rhineland Paper Co.
CRD	: Croda, Inc.	LMI	: North American Chemical Co.
CRN	: CPC International, Inc., Amerchol Corp.	LUR	: Laurel Products Corp.
CRT	: Crest Chemical Corp.		:
CRZ	: Crown Zellerbach Corp.	MAR	: American Can Co., Lignin Chemicals Div.
CTL	: Continental Chemical Co.	MCP	: Moretex Chemical Products, Inc.
CWP	: Consolidated Papers, Inc.	MIL	: Milliken & Co., Milliken Chemical Div.
CYL	: Cyclo Chemicals Corp.	MIR	: Miranol Chemical Co., Inc.
	:	MOA	: Mona Industrial, Inc.
DA	: Diamond Shamrock Corp.	MON	: Monsanto Co.
DAN	: Dan River, Inc., Chemical Products Div.	MRD	: Marden-Wild Corp.
DEX	: Dexter Chemical Corp.	MRT	: Morton-Norwich Products, Inc., Morton Chemical
DOW	: Dow Chemical Corp.		: Co. Div.
DUP	: E.I. duPont de Nemours & Co., Inc.	MRV	: Marlowe-Van Loan Corp.
DYS	: Davies-Young Co.		:
	:		:
ECC	: Eastern Color & Chemical Co.	NCC	: Niacet Corp.
EFH	: E.F. Houghton & Co.	NCW	: Nostrup Chemical Works, Inc.
	:		:

TABLE 3.--SURFACE-ACTIVE AGENTS: DIRECTORY OF MANUFACTURERS, 1981--CONTINUED

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
NES	Reutgers-Nease Chemical Co.	SHX	Sherex Chemical Co., Inc.
NMC	National Milling & Chemical Co.	SID	George F. Siddal Co., Inc.
NPR	Safeway Stores, Inc.	SLC	Soluol Chemical Co., Inc.
NTL	NL Industries, Inc.	SLM	Salem Oil & Grease Co.
OMC	Olin Corp.	SNW	Sun Chemical Corp., Chemicals Div.
ONX	Onyx Chemical Co.	SOC	Standard Oil Co. of California, Chevron Chemical Co.
ORA	M & T Chemicals, Inc.	SOP	Southern Chemical Products Co.
ORO	Chevron Chemical Co.	SOS	SSC Industries, Inc.
PC	Proctor Chemical Co., Inc.	SPA	Scott Paper Co.
PEK	Peck's Products Co.	STC	American Hoechst Corp., Sou-Tex Works
PEL	Peltron Corp.	STP	Stepan Chemical Co.
PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.	SVC	Stokely-Van Camp, Inc., Industrial Products Group
PIL	Pilot Chemical Co.	SYL	Sylvachem Corp.
PLX	Plex Chemical Corp.	SYT	Synthron, Inc.
PNX	Murphy-Phoenix Co.	TCC	Sybron Corp., Chemical Division/Tanatex
PRX	Purex Corp.	TCH	Emery Industries, Inc., Trylon Div.
PSP	Georgia-Pacific Corp., Bellingham Div.	TCI	Morton-Norwich Products, Inc., Textize Div.
QCP	Quaker Chemical Corp.	TEN	Cities Service Co., Copperhill Operations
RAY	ITT Rayonier, Inc.	TMH	Thompson Hayward Chemical Co.
RBC	Fike Chemicals, Inc.	TNA	Ethyl Corp.
RCD	Richardson Co.	TNI	Gillette Co., Chemical Div.
RH	Rohm & Haas Co.	TX	Texaco, Inc.
ROB	Robeco Chemicals, Inc.	UCC	Union Carbide Corp.
RSA	R.S.A. Corp.	UDI	Petrochemicals Co., Inc.
S	Sandoz, Inc., Colors & Chemicals Div.	UNN	United Chemical Corp. of Norwood
SBC	Scher Chemicals, Inc.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SBP	Sugar Beet Products Co.	VAL	Valchem Div. of United Merchants & Manufacturers, Inc.
SCM	SCM Corp., Organic Chemical Div.	VND	Van Dyk & Co., Inc.
SCO	Scholler, Inc.	VPC	Mobay Chemical Corp., Dyestuff Div.
SCP	Henkel Corp.	WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.
SDC	Martin-Marietta Corp., Sodyeco Div.	WBG	White & Bagley Co.
SDH	Hilton Davis Chemical Co. Div.	WHI	White & Hodges, Inc.
SDW	Sterling Organics Div.	WHW	Whittemore-Wright Co., Inc.
SEA	Seaboard Chemicals, Inc.	WM	American Can Co., Inolex Chemicals Co.
SFS	Stauffer Chemical Co., Specialty Div.	WTC	Witco Chemical Corp.
SHC	Shell Oil Co., Shell Chemical Co.	WVA	Westvac Corp., Polychemicals Dept.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 176 reporting companies and company divisions for which permission to publish was not restricted.

## STATISTICAL HIGHLIGHTS

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

U.S. production of pesticides and related products in 1981 amounted to 1,430 million pounds--2.6 percent less than the 1,468 million pounds reported for 1980 (table 1).<sup>1</sup> Sales in 1981 were 1,291 million pounds, a decline of 8.2 percent, as compared with 1,406 million pounds reported in 1980; the value of sales was \$4,652 million in 1981, compared with \$4,078 million in 1980--an increase of 14.1 percent.

The output of cyclic pesticides and related products amounted to 1,012 million pounds in 1981--4.0 percent less than the 1,054 million pounds produced in 1980. Sales in 1981 were 907 million pounds, valued at \$3,504 million, compared with 1,017 million pounds, valued at \$3,080 million in 1980. Production of acyclic pesticides and related products in 1981 amounted to 418 million pounds, compared with 414 million pounds reported for 1980. Sales in 1981 were 383 million pounds compared with 389 million pounds reported in 1980; the value of sales were 1,148 million in 1981, compared with \$999 million in 1980--an increase of 15.0 percent.

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





TABLE 1.--PESTICIDES AND RELATED PRODUCTS: U.S. PRODUCTION AND SALES, 1981

[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 <sup>1</sup>	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand Total-----	1,430,075	1,290,641	4,652,382	\$3.61
Benzenoid-----	792,733	723,495	2,890,076	4.00
Nonbenzenoid-----	637,342	567,146	1,762,306	3.11
CYCLIC				
Total-----	1,012,429	907,365	3,503,886	3.86
Fungicides, total-----	117,016	118,330	322,215	2.72
Naphthenic acid, copper salt-----	352	325	343	1.06
All other cyclic fungicides <sup>2</sup> -----	116,664	118,005	321,872	2.74
Herbicides and plant growth regulators, total-----	677,280	570,394	2,297,898	4.03
2,4-Dichlorophenoxyacetic acid-----	12,916	7,221	7,489	1.04
2,4-Dichlorophenoxyacetic acid, dimethylamine salt-----	19,814	17,642	22,478	1.27
Dinitrobutylphenol-----	11,623	8,818	12,255	1.39
All other cyclic herbicides <sup>3</sup> -----	632,927	536,713	2,255,676	4.20
Insecticides and rodenticides, total-----	218,133	218,641	883,773	4.04
Organophosphorus insecticides <sup>4</sup> -----	89,134	81,245	311,880	3.84
All other cyclic insecticides and rodenticides <sup>5</sup> -----	128,999	137,396	571,893	4.16
ACYCLIC				
Total-----	417,646	383,276	1,148,496	3.00
Fungicides, total-----	25,659	25,819	40,877	1.58
Dithiocarbamic acid salts <sup>6</sup> -----	22,185	23,095	33,972	1.47
All other acyclic fungicides-----	3,474	2,724	6,905	2.54
Herbicides and plant growth regulators <sup>7</sup> -----	161,800	153,621	611,068	3.98
Insecticides, rodenticides, soil conditioners and fumigants, total-----	230,187	203,836	496,551	2.44
Organophosphorus insecticides <sup>8</sup> -----	67,316	68,616	267,009	3.89
Trichloronitromethane (Chloropicrin)-----	...	5,661	5,122	.90
All other acyclic insecticides, rodenticides, soil conditioners and fumigants <sup>9</sup> -----	162,871	129,559	224,420	1.73

<sup>1</sup>Calculated from unrounded figures.

<sup>2</sup>Includes benomyl, captafol, captan, chlorothalonil, dinocap, DMTT, folpet, PCNB, PCP, PMA, sodium pentachlorophenate, and others.

<sup>3</sup>Includes alachlor, atrazine, benefin, bensulide, other 2,4-D esters and salts, 2,4-DB, dicamba, dinitrophenol compounds, diuron, isopropyl phenylcarbamates (IPC and CIPC), MCPA, molinate, NPA, picloram, propanil, triazines, trifluralin, uracils, plant growth regulators, and others.

<sup>4</sup>Includes carbofenthiol, diazinon, dioxathion, methyl parathion, and other phosphorothioates and phosphorodithioates.

<sup>5</sup>Includes carbaryl, carbofuran, chlorinated insecticides (chlordan, chlorobenzilate, DDT, heptachlor, toxaphene, and others), insect attractants, DEET and other insect repellents, small amounts of rodenticides, and others.

<sup>6</sup>Includes maneb, nabam, and zincb, plus the remaining dithiocarbamates which are used chiefly as fungicides.

<sup>7</sup>Includes butylate, dalapon, EPTC, methanearsonic acid salts, thiocarbamates, and organophosphorus herbicides, and others.

*Footnotes--Continued*

<sup>8</sup>Includes acephate, DDVP, disulfoton, ethion, malathion, phorate, and other organophosphorus insecticides.

<sup>9</sup>Includes methomyl, methyl bromide, 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 REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
*FUNGICIDES--CONTINUED	
2,4,5,6-tetrachlorosophthalonitrile	DA.
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (DMIT)	MRK, VCC.
2-(Thiocyanomethylthio)benzothiazole	BKM.
N-Trichloromethylthio-4-cyclohexene-1,2-dicarbonyl (Captan)	SFA, SFC.
N-Trichloromethylthiothalamide (folpet)	SFA, SFC.
1,3,5-Tri(2-isopropanol)-s-triazine	EPH.
Cyclic fungicides, all other	LIL, RH.
*HERBICIDES AND PLANT GROWTH REGULATORS:	
3-Amino-2,5-dichlorobenzoic acid, ammonium salt (2,5-Dichloro-3-aminobenzoic acid, ammonium salt)	GAF, UCC.
4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	CHG, DUP.
4-Amino-3,5,6-trichloropicolinic acid (Picloram)	DOM.
4,6-Bis(isopropylamino)-2-methoxy-s-triazine (Prometon)	CGY.
2,4-Bis(isopropylamino)-6-(methylthio)-s-triazine (Prometryn)	CGY.
5-Bromo-3-sec-butyl-6-methyluracil (Bromacil)	DUP.
2-(tert-Butylamino)-4-chloro-6-(ethylamino)-s-triazine	CGY.
2-(tert-Butylamino)-4-ethylamino-6-(methylthio)-s-triazine	CGY.
3-tert-Butyl-5-chloro-6-methyluracil	DUP.
N-Butyl-N-ethyl- $\alpha,\alpha,\alpha$ -trifluoro-2,6-dinitro-p-toluidine (Benefin)	LIL.
N-(Chloroacetyl)-N-(2,6-diethylphenyl)glycine, ethyl ester	BHA.
2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	CGY.
2-Chloro-4,6-bis(isopropylamino)-s-triazine (Propazine)	CGY.
2-Chloro-4-(cyclopropylamino)-6-(isopropylamino)-s-triazine (Cypazine)	SHC.
2-Chloro-2',6'-diethyl-N-(n-butoxymethyl)acetanilide (Butachlor)	MON.
2-Chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide (Alachlor)	MON.
2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene (Oxyfluorfen)	RH.
2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (Atrazine)	CGY, FRI, SHC.

TABLE 2. -- PESTICIDES AND RELATED PRODUCTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
*HERBICIDES AND PLANT GROWTH REGULATORS--CONTINUED	
N-(2-Chloroethyl)- $\alpha,\alpha$ -trifluoro-2,6-dinitro-N-propyl-p-toluidine (Fluchloralin)	BAS.
2-Chloro-N-isopropylacetanilide (Propachlor)	DOM, MON.
4-Chloro-5-(methylamino)-2-( $\alpha,\alpha$ -trifluoro-m-tolyl)-3-(2H)-pyridazinone (Norflurazon)	S.
2-(4-Chloro-2-methylphenoxy)propionic acid (MCPP)	DA.
2-(4-Chloro-2-methylphenoxy)propionic acid dimethylamine salt	DA.
5-(2-Chloro-4-trifluoromethylphenoxy)-2-nitrobenzoic acid, sodium salt	SDC.
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	DUP.
N-(Cyclopropylmethyl)- $\alpha,\alpha$ -trifluoro-2,6-dinitro-N-propyl-p-toluidine (profluralin)	CGY.
3,5-Dibromo-4-hydroxybenzotrifluoride, octanoic acid esters (Bromoxynil octanoate)	RDA.
3,6-Dichloro-2-anisic acid (Dicamba)	VEL.
4-(2,4-Dichlorophenoxy)butyric acid (2,4-DB Acid)	RDA.
4-(2,4-Dichlorophenoxy)butyric acid, iso-octyl ester	RDA.
3-(3,4-Dichlorophenyl)-1,1-dimethylurea (Diuron)	DUP.
3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea (Linuron)	DUP.
2,4-Dichlorophenyl p-nitrophenyl ether	RH.
3',4'-Dichloropropionanilide (Propanil)	CYT, RH, VTC.
S-(0-Diisopropyl phosphorodithioate) ester of N-( $\alpha$ -mercaptoethyl)benzenesulfonamide (Bensulfide)	SFA.
1,1'-Dimethyl-4,4'-bipyridinium dichloride	X.
N,N-Dimethyl-2,2-diphenylacetamide (Diphenamid)	CMN.
N-(1,1-Dimethyl-2-propenyl)-3,5-dichlorobenzamide (Pronamide)	RH.
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	DA.
*Dimethylphenol (DMAP)	DOM, USR, VTC.
Dinitrobutylphenol, ammonium salt	DOM.
Dinitrobutylphenol, triethanolamine salt	DOM, VTC.
2,6-Dinitro-N,N-dipropyl cumidine	LII.
3,5-Dinitro-N,N-dipropylsulfanilamide	LAR, SDC.
2-(Ethylamino)-4-(isopropylamino)-5-(methylthio)-5-triazine (Ametryne)	CGY.
5-Ethyl cyclohexylethylthiocarbamate	SFA.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
*HERBICIDES AND PLANT GROWTH REGULATORS--CONTINUED	
S-Ethyl-hexahydro-1H-azepine-1-carbothioate (Molinate)	SPA.
2-(Ethythio)-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 (CIPC)	PPG, RBC.
Isopropyl N-phenylcarbamate (IPC)	PPG, RBC.
1-(2-Methylcyclohexyl)-3-phenylurea (Siduron)	DUP.
Methyl 5-(2',4'-dichlorophenoxy)-2-nitrobenzoate	SM.
1-Naphthylphthalamic acid (NPA)	USR.
7-Oxabicyclo-[2.2.1]-heptane-2,3-dicarboxylic acid, disodium salt (Endothall)	PMS.
PHENOXYACETIC ACID DERIVATIVES:	
4-Chloro-2-methylphenoxyacetic acid (MCPA)	DA.
4-Chloro-2-methylphenoxycetic acid, dimethylamine salt	DA.
2,4-DICHLOROPHENOXYACETIC ACID, ESTERS AND SALTS:	
*2,4-dichlorophenoxyacetic acid (2,4-D)	DA, DOM, RDA.
2,4-dichlorophenoxyacetic acid, butoxyethanol ester	DOM.
2,4-dichlorophenoxyacetic acid, butoxypropylene glycol ester	DOM.
2,4-dichlorophenoxyacetic acid, sec-butyl ester	DOM.
*2,4-dichlorophenoxyacetic acid, dimethylamine salt	DA, DOM, PBI, RDA, RIV.
2,4-Dichlorophenoxyacetic acid, ethanolamine and isopropanolamine salts	DOM.
2,4-Dichlorophenoxyacetic acid, isobutyl ester	RDA.
2,4-Dichlorophenoxyacetic acid, iso-octyl ester	DOM, RDA, RIV.
2,4-Dichlorophenoxyacetic acid, isopropyl ester	AMV.
2,4-Dichlorophenoxyacetic acid, lithium salt	ETH.
2,4-Dichlorophenoxyacetic acid, sodium salt	RIV.
2,4-Dichlorophenoxyacetic acid, esters and salts, all other	VEL.
2,4,5-TRICHLOROPHENOXYACETIC ACID, ESTERS AND SALTS:	
2,4,5-Trichlorophenoxyacetic acid, butoxyethanol ester	DOM.
2,4,5-Trichlorophenoxyacetic acid, butoxypropylene glycol ester	DOM.
2,4,5-Trichlorophenoxyacetic acid, triethylamine salt	DOM.



TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*HERBICIDES AND PLANT GROWTH REGULATORS--CONTINUED	
PLANT GROWTH REGULATORS:	
2-Chloro-6-(trichloromethyl)pyridine	DOM.
1,2-Dihydro-3,6-pyridazinone (Maleic hydrazide) (MH)	FMT, USR.
1,1-Dimethylpiperidinium chloride	BAS.
Gibberellic acid	ABB.
3-Indolebutyric acid	HRK.
1-Naphthalenesulfonic acid (NAA)	GNM.
1-Naphthalenesulfonic acid, sodium salt	GNM.
Plant growth regulators, cyclic, all other--	ABB, USR.
Sodium 5-(2-chloro-4-(trifluoromethyl)-phenoxy)-2-nitrobenzoate	RH.
2-(2,4,5-Trichlorophenoxy)propionic acid, 2-butoxypropylene ester	DOM.
$\alpha$ , $\alpha$ -Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (Trifluralin)	ACY, IIL.
1,1,1-Trifluoro-N-(2-methyl-4-(phenylsulfonyl)-phenyl)methanesulfonamide	CGY.
Cyclic herbicides, all other	MMM.
Cyclic herbicides, all other	PFZ, INA, VGC.
N,N-Diethyltoluamide (DEET)	AIC.
Insect attractants, all other--	
*INSECTICIDES:	
Bacillus thuringiensis	ABB, S.
(5-Benzyl-3-furyl)methyl-2,2-dimethyl-3-(2-methylpropenyl)cyclopropane carboxylate	
Resmethrin	BEX.
2,3,4,5,6-Butenyne-tetrahydrofural	PLC.
2-(p-tert-butylphenoxy)cyclohexyl-2-propynyl sulfite	USR.
CHLORINATED INSECTICIDES:	
Ethyl 4,4'-dichlorobenzilate (Chlorobenzilate)	CGY.
Heptachloro-tetrahydro-endo-methanoindene (Heptachlor)	VEL.
Hexachlorocyclohexane, endo, endo-dimethanophthalene (Endrin)	VEL.
Octachlorocyclohexane, endo, endo, endo, endo, endo, endo, endo, endo (Chlordan)	VEL.
Toxaphene (Chlorinated camphene)	BHA, VTC.
1,1,1-Trichloro-2,2-bis(p-chlorophenyl)ethane (DDT)	MTO.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
*INSECTICIDES--CONTINUED	
CHLORINATED INSECTICIDES--CONTINUED	
1,1,1-trichloro-2,2-bis(p-methoxyphenyl)ethane (Methoxychlor) - - - - -	CHF, DUP.
cyano(3-phenoxyphenyl)methyl-4-chloro- $\alpha$ -(1-methylethyl)benzeneacetate - - - - -	SHC.
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl(dibutylamino)thio(methyl carbamate) - - - - -	FMX.
2,2-Dimethyl-1,3-benzodioxol-4-yl N-methylcarbamate - - - - -	FSN.
5,6-Dimethyl-2-dimethylamino-4-pyrimidinyl dimethyl carbamate - - - - -	X.
Di-n-propylisocinchonate - - - - -	MGK.
Distinnane, Hexakis(2-methyl-2-phenylpropyl) - - - - -	SHC.
N-(Mercaptomethyl)phthalimide 5-(0,0-dimethylphosphorothioate) - - - - -	SFA.
Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboate - - - - -	FMX.
1-Naphthyl N-methylcarbamate (Carbaryl) - - - - -	UCC.
ORGANOPHOSPHORUS INSECTICIDES:	
S-[[p-Chlorophenyl]thio(methyl) 0,0-diethyl phosphorodithioate (Carbophenothion)- - - - -	SFA.
2-Chloro-1-(2,4,5-trichlorophenyl)vinyl dimethyl phosphate (Retrachlorvinphos) - - - - -	SHC.
O-(2,4-Dichlorophenyl) O-ethyl S-propyl phosphorodithioate - - - - -	CHG.
2-(Diethoxyphosphanyl)imino)-4-methyl-1,3-dithiolane - - - - -	ACY, LAK.
O,0-Diethyl O-(2-isopropyl-4-methyl-6-pyrimidinyl) phosphorothioate (Diazinon)- - - - -	CGY, VEL.
O,0-Diethyl O-(4-(methylsulfanyl)phenyl) phosphorothioate - - - - -	CHG.
O,0-Diethyl O-(p-nitrophenyl)phosphorothioate (Parathion) - - - - -	MOX.
O,0-Diethyl O-3,5,6-trichloro-2-pyridyl phosphorothioate - - - - -	DOM.
O,0-Dimethyl O-[4-(methylthio)-m-tolyl] phosphorothioate (Fenthion) - - - - -	CHG.
O,0-Dimethyl O-(p-nitrophenyl)phosphorothioate (Methyl parathion) - - - - -	MOX.
O,0-Dimethyl O-(4-nitro-m-tolyl)phosphorothioate (fenitrothion) - - - - -	MTP.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED	
*INSECTICIDES--CONTINUED	
ORGANOPHOSPHORUS INSECTICIDES--CONTINUED	
0,0-Dimethyl 0-(2,4,5-trichlorophenyl)-phosphorothioate (Ronnel)	DOM.
0,0-Dimethyl S-[[4-oxo-1,2,3-benzotriazin-3(4H)-yl]methyl]phosphorodithioate (Azinphos-methyl)	CHG.
2,3-P-Dioxamedithiol S,S-bis-(0,0-diethyl phosphorodithioate (Dioxathion)	BHA.
0-Ethyl 0-[(4-methylthio)phenyl] S-propyl phosphorodithioate	CHG.
0-Ethyl 0-(p-nitrophenyl)phenylphosphonothioate (EPN)	DUP, SFA, VEL.
0,0,0',0'-Tetramethyl-0,0'-thiodi-p-phenylene phosphorothioate	SFA.
Organophosphorus insecticides, cyclic, all other	ACY.
Permethrin	S.
Tetrahydro-5,5-dimethyl-2(1h)-pyrimidinone[3-(4-trifluoromethyl)phenyl]-1-[2-(4-trifluoromethyl)phenyl]ethenyl]-2-propenylidene]hydrazone	ACY.
Cyclic insecticides, all other	FHN, PEN, S, VTC, X, X.
NEMATOCIDES:	
0,0-Diethyl 0-(2,4-dichlorophenyl)phosphorothioate (Dichlofenthion)	RDA, SM.
RODENTICIDES:	
3-(o-Acetylphenyl)-4-hydroxycoumarin (Marfazin)	MOT.
2-Diphenylacetyl-1,3-indandione and sodium salt	MOT.
2-Pivaloyl-1,3-indandione (Pindone)	MOT.
Rodenticides, cyclic, all other	X.
CYCLIC PESTICIDES, ALL OTHER:	
4-Bromoacetoxymethyl-N-dioxoline	EPH.
a-[2-(2-n-Butoxyethoxy)-ethoxy]-4,5-methylenedioxy-N-(2-Ethylhexyl)bicyclo(2.2.1)-5-heptene-2,3-dicarboximide	ALP, TNA.
ACYCLIC	MGK.
*FUNGICIDES:	
Bis-1,4-bromoacetoxy-2-butene	VIN.
Chloromethoxypropylmercuric acetate	TRO.
1,2-Dibromo-2,4-dicyanobutane	MRK.
Disodium cyanodithioimidocarbonate	BKM.
n-Dodecylguanidine acetate (Dodine)	ACY.
Dodecylguanidine hydrochloride	MRK.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*FUNGICIDES--CONTINUED	
Methylene bis(thiocyanate)	MRR, VCC.
*DITHIOCARBAMIC ACID FUNGICIDES:	
Dimeythidithiocarbamic acid, ferric salt (Ferbam)	FMN.
Dimeythidithiocarbamic acid, potassium salt	BKM.
Dimeythidithiocarbamic acid, sodium salt	VCC.
Ethylene bis(dithiocarbamic acid), disodium salt (Nabam)	ALC, VCC.
Ethylene bis(dithiocarbamic acid), manganese salt (Maneb)	RH.
Ethylene bis(dithiocarbamic acid), manganese salt with zinc ions	RH.
Ethylene bis(dithiocarbamic acid), zinc salt (Znened)	FMN, RH.
N-Meethyldithiocarbamic acid, potassium salt	BKM.
Dithiocarbamic acid fungicides, acyclic, all other	BKM, FMN, VNC, X.
*HERBICIDES AND PLANT GROWTH REGULATORS:	
N,N-Bis(phosphonemethyl)glycine	MON.
2-Chloroallyl diethylthiocarbamate (CDEC)	MON.
2-Chloro-N,N-diallylacetamide (CDAA)	MON.
S-(2,3-Dichloroallyl) diisopropylthiocarbamate (Diallate)	MON.
2,2-Dichloropropionic acid, sodium salt (Dalapon)	MON.
Dimethylarsinic acid (Cacodylic acid)	CYT.
N-[5-(1,1-Dimethylethyl)-1,3,4-thiadiazol-2-yl]-N,N'-dimethylurea (Tebuthiuron)	MRT.
Ethyl carbanoylphosphonate, ammonium salt	DUP.
S-Ethyl diisobutylthiocarbamate (Butylate)	SFA.
S-Ethyl dipropylthiocarbamate (EPTC)	SFA.
Methanearsonic acid, disodium salt (DSMA)	CLV, VIN.
Methanearsonic acid, dodecyl and octyl ammonium salts	CLV.
Methanearsonic acid, monosodium salt (MSMA)	CYT, DA.
N-(Phosphonemethyl)glycine, isopropylamine salt	MON.
S-Propyl butylethylthiocarbamate (Fenbutate)	SFA.
S-Propyl dipropylthiocarbamate (Vernolate)	SFA.
S,S,S-Tributyl phosphorothioate	PLC.
Tributyl phosphorothioate (Merphos)	RDA, SM.
S-(1,2,3-Trichloroallyl) diisopropylthiocarbamate (Triallate)	MON.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*HERBICIDES AND PLANT GROWTH REGULATORS--CONTINUED	
PLANT GROWTH REGULATORS:	
2-(Chloroethyl)phosphonic acid	GAF, UCC
Succinic acid, 2,2-dimethylhydrazide	USR
Plant growth regulators, acyclic, all other	MON.
Acyclic herbicides	S.
INSECTICIDES:	
2-(2-Butoxyethoxy)ethyl thiocyanate	RH.
Methyl N',N'-dimethyl-N-[(methylcarbamoyl)oxy]-1-thiooxamidate	DUP.
S-Methyl-N-[(methylcarbamoyl)oxy]thioacetimidate (Methomyl)	DUP, SHC.
2-Methyl-2-(methylthio)propionaldehyde O-(methylcarbamoyl)oxime (Aldicarb)	UCC.
*ORGANOPHOSPHORUS INSECTICIDES:	
S-[1,2-Bis(ethoxycarbonyl)ethyl]O,0-dimethyl phosphorodithioate (Malathion)	ACY.
2-Carbomethoxy-1-propen-2-yl dimethyl phosphate	AMV, SHC.
1,2-Dibromo-2,2-dichloroethyl dimethyl phosphate (Malel)	AMV, SHC.
O,0-Diethyl S-[2-(ethylthio)ethyl] phosphorodithioate (Disulfoton)	CHG.
O,0-Diethyl O-[2-(ethylthio)ethyl] phosphorothioate (Demeton O)	CHG.
O,0-Diethyl S[(ethylthio)methyl] phosphorodithioate (Phorate)	ACY.
3-(Dimethoxyphosphinyloxy)-N,N-dimethyl-cis-crotonamide	SHC.
O,S-Dimethylacetophosphoramidothioate (Acephate)	SOC.
O,0-Dimethyl-0-2,2-dichlorovinyl phosphate (DDVP)	AMV, CLO, SHC.
S-[[1,1-Dimethylthio]thio]methyl]O,0-diethyl phosphorodithioate (Fuzbufo)	ACY.
O,0-Dimethyl S-(N-methylcarbamoyl)methyl] phosphorodithioate (Dimethoate)	ACY.
Dimethyl phosphate of 3-hydroxy-N-methyl-cis-crotonamide	SHC.
O,S-Dimethyl phosphoramidothioate	CHG.
O,0-Dimethyl phosphorochloridothioate	CHG.
O,0,0',0'-Tetraethyl S,S',-methylene bisphosphorodithioate (Ethion)	FMN.
Organophosphorus insecticides, acyclic, all other	X.
Acyclic insecticides, all other	X.

TABLE 2.--PESTICIDES AND RELATED PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

PESTICIDES AND RELATED PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
RODENTICIDES:	
2-Hydroxyethyl n-octyl sulfide	PLC.
Sodium fluoracetate	TUL.
Rodenticides, acyclic, all other	RBC.
SOIL CONDITIONERS:	
Polyacrylonitrile, hydrolyzed, sodium salt	ACY.
SOIL FUNGICIDS:	
1,3-Dichloropropene	DOM.
1,3-Dichloropropene, 1,2-dichloropropane	DOM, SHC.
O-Ethyl S,S-dipropyl phosphorodithioate	RDA, SM.
Methyl bromide (Bromomethane)	DOM, GTL, VEL.
N-Methylidithiocarbamic acid, sodium salt (Metham)	SFA.
Methyl isothiocyanate	MRT.
*Trichloronitromethane (Chloropicrin)	DOM, IMG, NIO.
ACYCLIC PESTICIDES, ALL OTHER:	
Diamino acetate	X.
2-((Hydroxymethyl)amino)-2-methylpropanol	TRO.
2-((Hydroxymethyl)ethanol	TRO.
3-Iodo-2-propynyl butylcarbamate	TRO.
Pesticides and related products, acyclic, all other	ARA, PAS, PCW, RBC, SHC, VIN, X.

TABLE 3.--PESTICIDES AND RELATED PRODUCTS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of pesticides and related products to the U.S. International Trade Commission for 1981 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	:: MOT	: Motomoco, Inc.
ACY	: American Cyanamid Co.	:: MRK	: Merck & Co., Inc.
AIC	: Albany International Corp.	:: MRT	: Morton-Norwick Products, Inc., Morton Chemical
ALC	: Alco Chemical Corp.	::	: Co. Div.
ALP	: Alpha Laboratories, Inc.	:: MTO	: Montrose Chemical Corp. of California
AMC	: Amvac Chemical Corp.	:: MTP	: Mount Pleasant Chemical Co.
ARA	: Araphoe Chemical, Inc., Sub/Syntec U.S.A.,	::	:
:	: Inc.	:: NLO	: Niklor Chemical Co., Inc.
:	:	::	:
BAS	: BASF Wyandotte Corp.	:: OMC	: Olin Corp., Specialty Chemicals Dept.
BHA	: Boots Hercules Agrochemicals Co.	::	:
BKM	: Buckman Laboratories, Inc.	:: PAS	: Pennwalt Corp.
:	:	:: PBI	: PBI-Gordon Corp.
CCA	: Interstab Chemicals, Inc.	:: PCW	: Pfister Chemical, Inc.
CGY	: Ciba-Geigy Corp., Agricultural Div.	:: PEN	: CPC International, Inc., Penick Div.
CHF	: Kincaid Enterprises, Inc.	:: PFZ	: Pfizer, Inc.
CHG	: Mobay Chemical Corp., Agricultural Chemicals	:: PLC	: Phillips Petroleum Co.
:	: Div.	:: PPG	: PPG Industries, Inc.
CLO	: Colorado Organic Chemical Co., Inc.	::	:
CLY	: W. A. Cleary Corp.	:: RBC	: Fike Chemicals, Inc.
COS	: Cosan Chemical Corp.	:: RCI	: Reichhold Chemicals, Inc.
CWN	: Upjohn Co., Fine Chemical Div.	:: RDA	: Rhone-Poulenc, Inc.
CYT	: Crystall Chemical Co.	:: RH	: Rohm & Haas Co.
:	:	:: RIV	: Riverdale Chemical Co.
DA	: Diamond Shamrock Corp. & Diamond Shamrock	::	:
:	: Agriculture Chemical, Inc., Phenoxy Plant	:: S	: Sandoz Inc., Crop Protection Dept.
DOW	: Dow Chemicals Co.	:: SDG	: Martin-Marietta Corp., Sodyeco Div.
DUP	: E. I. duPont de Nemours & Co., Inc.	::	: Stauffer Chemical Co.:
:	:	:: SFA	: Agricultural Div.
EFH	: E. F. Houghton & Co.	:: SFC	: Calhio Chemicals, Inc.
:	:	:: SHC	: Shell Oil Co., Shell Chemical Co. Div.
FER	: Ferro Corp., Ferro Chemical Div.	:: SM	: Mobil Oil Corp., Mobil Chemical Co.,
FMN	: FMC Corp., Agricultural Chemical Div.	::	: Phosphorus Div.
FMT	: Fairmount Chemical Co.	:: SOC	: Standard Oil Co. of California, Chevron
FRI	: Farmland Industries, Inc.	::	: Chemical Co.
FRO	: Vulcan Materials Co., Chemicals Div.	:: SOL	: Southland Corp., Fine Chemicals Div.
FSN	: BFC Chemicals Inc.	::	:
:	:	:: TNA	: Ethyl Corp.
GAF	: GAF Corp.	:: TRO	: Troy Chemical Corp.
GNW	: Greenwood Chemical Co.	:: TUL	: Tull Chemical Co., Inc.
GTH	: Guth Corp.	::	:
GTL	: Great Lakes Chemical Corp.	:: UCC	: Union Carbide Corp.
:	:	:: USR	: Uniroyal, Inc., Uniroyal Chemical Div.
IMC	: International Minerals & Chemicals Corp.	::	:
:	:	:: VCC	: Vinings Chemical Co.
LAK	: Bofors Nobel, Inc. & Lakeway, Inc.	:: VEL	: Velsicol Chemical Corp.
LIL	: Eli Lilly & Co.	:: VGC	: Virginia Chemicals, Inc.
:	:	:: VIN	: Vineland Chemical Co., Inc.
MCI	: Mooney Chemical, Inc.	:: VNC	: Vanderbilt Chemical Corp.
MGK	: McLaughlin Gormley King Co.	:: VTC	: Vertac Chemical Corp.
MMM	: Minnesota Mining & Manufacturing Co.	::	:
MON	: Monsanto Co.	:: WTC	: Witco Chemical Corp.
:	:	::	:

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 85 reporting companies and company divisions for which permission to publish was not restricted.





SECTION XIV -- MISCELLANEOUS END-USE CHEMICALS  
AND CHEMICAL PRODUCTS

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STATISTICAL HIGHLIGHTS

David G. Michels

This section incorporates those end-use groups which are not readily classifiable within the prior sections of this report. Both cyclic and acyclic chemicals fall within this section. With the exception of methionine and its salts, photographic chemicals, water soluble polymers, and tanning materials, both production and sales of all other end-use groups contained within this section decreased from 1980 levels.

In 1981, the production of miscellaneous end-use chemicals exceeded 22.1 billion pounds, a decrease of 6.1 percent from the more than 23.6 billion pounds of production reported for 1980. Sales in 1981 totaled 12.9 billion pounds, valued at \$3.9 billion. The sales quantity decreased 8.0 percent from that of 1980 with the value of sales increasing by 14 percent. Polymers for fibers and urea collectively accounted for 83 percent of the 1981 production of these miscellaneous end-use chemicals. Urea accounted for 73 percent of the 1981 sales quantity of these chemicals.

In 1981, the production of lubricating oil and grease additives totaled 1.5 billion pounds, a decrease of 10 percent, compared with 1980. Total sales quantity for 1981 was 1.1 billion pounds, 7 percent less than the 1980 sales quantity of 1.2 billion pounds, while the value of sales increased 2.4 percent to \$895 million.

Production of fuel additives for 1981 totaled 1.4 billion pounds, a decrease of 5.2 percent from the previous year. Total sales quantity for 1981 was 1.1 billion pounds, down 14 percent from the 1980 sales quantity of 1.3 billion pounds, with the sales value decreasing 4 percent to \$669 million.



TABLE 1.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS: U.S. PRODUCTION AND SALES, 1981

[Listed below are all miscellaneous end-use chemicals and chemical 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 miscellaneous end-use chemicals and chemical products for which data on production and/or sales were reported and identifies the manufacturers of each]

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	SALES			
	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total-----	22,158,278	12,953,915	3,975,194	\$0.31
Chelating agents, nitriloacids and salts, total-----	217,761	198,793	110,549	.56
(Diethylenetrinitrilo)pentaacetic acid, penta- sodium salt-----	6,604	10,080	3,844	.38
(Ethylenedinitrilo)tetraacetic acid (EDTA)-----	10,191	6,645	7,177	1.08
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate-----	...	265	293	1.10
(Ethylenedinitrilo)tetraacetic acid, disodium salt--	1,187	...	...	...
(Ethylenedinitrilo)tetraacetic acid, manganese salt--	1,384	...	...	...
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt-----	81,959	71,417	26,606	.37
(Ethylenedinitrilo)tetraacetic acid, trisodium salt--	...	2,925	3,212	1.10
(N-Hydroxyethylethylenedinitrilo)triacetic acid, iron salt-----	...	1,520	1,361	.90
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt-----	5,337	5,424	3,175	.59
Nitrilo-tris-methylene triphosphonic acid, sodium salt-----	1,056	...	...	...
All other-----	110,043	100,517	64,881	.65
Chemical indicators-----	11	16	857	52.20
Enzymes, total-----	( <sup>2</sup> )	( <sup>2</sup> )	45,768	( <sup>2</sup> )
Hydrolytic enzymes, total-----	( <sup>2</sup> )	( <sup>2</sup> )	39,042	( <sup>2</sup> )
Amylases-----	( <sup>2</sup> )	( <sup>2</sup> )	10,252	( <sup>2</sup> )
Proteases, total-----	( <sup>2</sup> )	( <sup>2</sup> )	20,931	( <sup>2</sup> )
Rennin-----	( <sup>2</sup> )	( <sup>2</sup> )	9,980	( <sup>2</sup> )
All other proteases-----	( <sup>2</sup> )	( <sup>2</sup> )	10,951	( <sup>2</sup> )
All other hydrolytic enzymes-----	( <sup>2</sup> )	( <sup>2</sup> )	7,859	( <sup>2</sup> )
Non-hydrolytic enzymes-----	( <sup>2</sup> )	( <sup>2</sup> )	6,726	( <sup>2</sup> )
Flotation reagents-----	6,200	3,530	6,402	1.81
Fuel additives, total <sup>3</sup> -----	1,405,017	1,111,109	668,611	.60
N,N'-Disalicylidene-1,2-propanediamine-----	1,587	1,116	3,603	3.23
Ethylenedibromide-----	168,588	...	...	...
Methyl-t-butyl ether-----	760,052	...	...	...
Tetraethyl lead-----	274,890	208,939	277,236	1.33
Tetra(methyl-ethyl) lead, (TEL-TML, reacted)-----	131,923	129,995	172,592	1.33
All other fuel additives-----	67,977	771,059	215,180	.28
Lubricating oil and grease additives, total-----	1,544,540	1,136,471	895,222	.79
Chlorosulfurized and sulfurized compounds-----	6,999	6,007	5,296	.88
Oil soluble petroleum sulfonate, calcium salt-----	244,165	200,858	158,804	.79
Oil soluble petroleum sulfonate, sodium salt-----	80,880	75,978	42,503	.56
Phenol salts, total-----	126,297	119,754	74,368	.62
Nonylphenol, barium salt-----	6,195	...	...	...
All other-----	120,102	119,754	74,368	.62
Sulfur compounds-----	356,358	257,734	216,016	.84
Zinc dialkyldithiophosphate-----	28,487	10,231	9,842	.96
All other lubricating oil and grease additives-----	701,354	465,909	388,993	.83
Methionine and its salts-----	82,806	74,435	98,840	1.33

See footnotes at end of table.

TABLE 1.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	SALES			
	PRODUCTION	QUANTITY		UNIT VALUE <sup>1</sup>
		1,000 pounds	1,000 pounds	1,000 dollars
Paint driers, naphthenic acid salts, total <sup>4</sup> <sup>5</sup> -----	10,702	8,446	13,628	\$1.61
Calcium naphthenate-----	494	496	548	1.10
Cobalt naphthenate-----	2,146	1,964	8,473	4.31
Lead naphthenate-----	3,970	4,127	2,888	.70
Manganese naphthenate-----	...	407	399	.98
Zinc naphthenate-----	1,345	1,199	1,009	.84
All other-----	2,747	253	311	1.23
Photographic chemicals, total-----	...	1,849	10,412	5.63
p-Diethylaminobenzenediazonium chloride-----	139	135	759	5.62
p-Dimethylaminobenzenediazonium chloride-----	126	123	648	5.26
All other photographic chemicals-----	...	1,591	9,005	5.66
Polymers for fibers, total-----	...	654,123	651,445	1.00
Nylon 6 and 6/6-----	1,957,925	...	...	...
Polyacrylonitrile and acrylonitrile copolymers-----	615,226	...	...	...
Polyethylene terephthalate-----	3,128,855	274,409	170,148	.62
All other polymers for fiber-----	...	379,714	481,297	1.27
Polymers, water soluble, total-----	335,140	286,536	417,528	1.46
Cellulose ethers and esters-----	164,695	157,976	268,319	1.70
Polyacrylamide-----	76,082	55,066	63,834	1.16
Polyacrylic acid salts, total-----	50,457	35,352	25,362	.72
Sodium polyacrylate-----	28,021	20,114	7,239	.36
All other polyacrylic acid salts-----	22,436	15,238	18,123	1.19
All other water soluble polymers-----	43,906	38,142	60,013	1.57
Tanning materials, synthetic-----	61,361	53,137	35,254	.66
Textile chemicals, other than surface-active agents, total-----	12,413	9,131	7,251	.79
Dimethylolhydroxyethylene urea-----	6,308	4,151	2,862	.69
Urea polymers with formaldehyde and methanol-----	1,131	...	...	...
All other textile chemicals-----	4,974	4,980	4,389	.88
Urea, total-----	11,877,044	...	...	...
In feed compounds-----	315,580	289,661	26,852	.09
In liquid fertilizer-----	3,352,760	2,818,109	272,200	.10
In solid fertilizer-----	7,841,870	5,968,004	633,140	.11
In plastics-----	309,951	267,157	24,252	.09
All other-----	56,883	...	...	...
All other miscellaneous end-use chemicals and chemical products <sup>6</sup> -----	903,012	73,408	56,983	.78

<sup>1</sup>Calculated from unrounded figures.<sup>2</sup>Not available.<sup>3</sup>Statistics exclude production and sales of tricresyl phosphate. Statistics on tricresyl phosphate are given with the section on "Plasticizers."<sup>4</sup>Quantities are given on the basis of solid naphthenate.<sup>5</sup>Statistics exclude production and sales of copper naphthenate. Statistics for copper naphthenate are given in the section on "Pesticides and Related Products."<sup>6</sup>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 REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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]

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Biological stains	ALD, EK, MRC.
*CHELATING AGENTS, NITRILACIDS AND SALTS:	
N-alkylamine bismethylene phosphonic acid	SCP.
N-alkylaminobismethylene phosphonic acid salts	RPC.
Aminotrimethyl phosphonic acid	SCP.
Diethylenetriaminepenta(methylene phosphonic acid)	WAY.
(Diethylenetriamine)pentamethylene phosphonic acid, sodium salt	WAY.
(Diethylenetriamino)pentaacetic acid	CGY, HMP.
(Diethylenetriamino)pentaacetic acid, monosodium hydrazine ferric salt	CGY.
*Diethylenetriamino)pentaacetic acid, pentasodium salt	CGY, DAN, DOM, HMP, RPC.
(Diethylenetriamino)pentamethylene phosphonic acid, pentasodium salt	EKT.
N,N-Dihydroxyethylglycine, sodium salt	HMP.
{(Dimethylamino)methylene}bisphosphoric acid, trisodium salt	BKM.
Ethanolglycine, disodium salt	HMP.
Ethylenebis-( $\alpha$ -amino-2-hydroxyphenol) acetic acid, hydrogenferric salt	CGY.
(Ethylene-bis-nitrilo)dimethylene phosphonic acid, potassium salt	WAY.
*{(Ethylenedinitrilo)tetraacetic acid (EDTA) (Ethylenediaminetetraacetic acid) salt	CGY, DOM, HMP.
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	CGY, DOM, HMP.
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	CGY, DOM, HMP.
(Ethylenedinitrilo)tetraacetic acid, diethanolamine salt	DOM.
*{(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	CGY, DAN, DOM, HMP.
(Ethylenedinitrilo)tetraacetic acid, disodium magnesium salt	DOM.
*{(Ethylenedinitrilo)tetraacetic acid, disodium salt	CGY, DOM, HMP.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*CHELATING AGENTS, NITRILACIDS AND SALTS--CONTINUED	
(Ethylenedinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	CGY, DOM, HMP.
*(Ethylenedinitrilo)tetraacetic acid, manganese salt	CGY, DOM, HMP.
(Ethylenedinitrilo)tetraacetic acid, monoammonium ferric salt	HMP.
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	CGY, HMP.
(Ethylenedinitrilo)tetraacetic acid, tetraammonium salt	CGY, DOM, HMP.
(Ethylenedinitrilo)tetraacetic acid, tetrapotassium salt	CGY, HMP.
*(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	CGY, CRT, DAN, DOM, HMP, RPC.
*(Ethylenedinitrilo)tetraacetic acid, trisodium salt	CGY, HMP, WAY.
Glucopentonic acid, sodium salt	BLZ.
Hexamethylenediaminetetra(methylenephosphonic acid), potassium salt	WAY.
Hexamethylenediaminetetra(methylenephosphonic acid)	WAY.
Hydroxyethane-1,4-phosphonic acid	MYO.
(N-Hydroxyethylthylenedinitrilo) triacetic acid	HMP.
(N-Hydroxyethylthylenedinitrilo) triacetic acid, copper salt	HMP.
*(N-Hydroxyethylthylenedinitrilo) triacetic acid, iron salt	CGY, DOM, HMP.
(N-Hydroxyethylthylenedinitrilo) triacetic acid, magnesium salt	HMP.
*(N-Hydroxyethylthylenedinitrilo) triacetic acid, trisodium salt	CGY, CRT, DAN, DOM, HMP, RPC.
Nitriloacetic acid, zinc salt	HMP.
Nitriloacetic acid	HMP.
Nitrilotriacetic acid, trisodium salt	HMP, MON.
Nitrilo-tris-methylene triphosphonic acid	BAN, MYO, WAY.
*Nitrilo-tris-methylene triphosphonic acid, sodium salt	BAK, MYO, WAY, X.
Polyamine polymethane phosphonic acid	SCP, MTC.
Chelating agents, nitrilacids and salts, all other	HMP, X.
*Chemical indicators	ALD, EK, GFS, HXL, MHC.
Chemical reagents	EK, GFS, RSA, X.
*ENZYMES:	
*HYDROLYTIC ENZYMES:	
*AMYLASES:	
Bacterial amylase	GBF, PMP.



TABLE 2. -- MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981 -- CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*ENZYMES--CONTINUED	
*HYDROLYTIC ENZYMES--CONTINUED	
*AMYLASES--CONTINUED	
Glucosylase	CRN.
Amylases, all other	GBF, PFZ, RH.
*PROTEASES:	
Bromelain	DOL.
Pepsin	GBF, PFZ.
Protease (bacterial)	CHH, SPR.
Rennet (microbial)	GBF, MLS.
*Hennin	GBF, PFZ.
Proteases, all other	CHH, GBF, MLS, PFZ.
Pectinase	PIC, PMP, SPR.
Hydrolytic enzymes including pectic enzymes and lipase, all other	GBF.
Cholesterol oxidase	BCK, JFR, MLS, RH, WBC.
Glucose oxidase	BCK, UPJ.
Glucose-6-phosphate dehydrogenase	BCK.
Glycerol kinase	BCK.
Urease	BCK.
Nonhydrolytic enzymes	OMS, PLB.
*FLOTATION REAGENTS:	
PHOSPHORODITHIOATES (DITHIOPHOSPHATES):	
Dicresylphosphorodithioic acid	ACY.
Dicresylphosphorodithioic acid, ammonium salt	ACY.
Dicresylphosphorodithioic acid, sodium salt	KCU.
Phosphorodithioates used as floatation reagents, all other	ESX.
OTHER FLOTATION REAGENTS:	
Allyl n-butyl trithiocarbonate	PLC.
Rosin amines	HPC.
Thiocarbamide (Diphenylthiourea)	ACY.
Xanthates and sulfides	PFZ.
Floatation reagents, all other	KCU.
*FUEL ADDITIVES:	
N,N'-di-sec-butyl-p-phenylenediamine	USR.
Diesel fuel additives	DUP, THA.
N,N'-diisobutyl-p-phenylenediamine	DUP, USR.
N,N'-Disalicylidene-1,2-propanediamine	DUP, FBR, GCM, SM, TX.
Ethylene dibromide	DOM, GTL, PPG, TNA.
Hexyl nitrate	THA.
Methyl t-butyl ether	ATR, ENJ, PTT, X.
Methylcyclopentadienylmanganese tricarbonyl	THA.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*FUEL ADDITIVES--CONTINUED	
4,4'-Methylenebis(2,6-di-tert-butylphenol)	TNA.
Mixed aryl diimides	SM.
Phenyl acid phosphate	HDG.
N-Phenyl-1-naphthylamine	USR.
Polybutylether carbamate	ORO.
Rust preventing additives	DUP.
*Tetraethyl lead	DUP, PFG, TNA, X.
*Tetra(methyl-ethyl)lead, (rel-tml,reacted)	DUP, PFG, TNA, X.
Tetramethyl lead	DUP, TNA, X.
Fuel additives, all other	DUP, GLY, TNA.
*LUBRICATING OIL AND GREASE ADDITIVES:	
*CHLOROSULFURIZED AND SULFURIZED COMPOUNDS:	
di-t-Amyl acid phosphate	SM.
Heterocyclic compounds, sulfurized	ORO.
Methylene-bridged polyalkyl phenols	TNA.
Oleyl acid phosphate	SM.
Chlorosulfurized and sulfurized compounds: used as lubricating oil and grease additives, all other	DUP, FER, GLY, SM, MTC.
OIL-SOLUBLE PETROLEUM SULFONATES:	
Oil-soluble petroleum sulfonate, ammonium salt	NTL.
Oil-soluble petroleum sulfonate, barium salt	PAR, X.
*Oil-soluble petroleum sulfonate, calcium salt	ORO, PAR, PLC, TNA, TX, WTC, X.
*Oil-soluble petroleum sulfonate, magnesium salt	WTC, X.
*Oil-soluble petroleum sulfonate, sodium salt	DA, ENJ, MOR, PAR, SHC, WTC, X.
Oil-soluble petroleum sulfonate, zinc salt	SM.
Oil-soluble petroleum sulfonate, all other	SHC, SM.
*PHENOL SALTS:	
Alkylphenol, calcium salt	ORO.
*Nonylphenol, barium salt	CCA, ERJ, FER, WTC.
Phenol salts, all other	TNA, TX, WTC, X.
PHOSPHORODITHIOATES (DIPHOSPHATES):	
Di-2-ethylhexylphosphorodithioic acid	ELC, SFA.
Di-N-Propylphosphorodithioic acid	ELC, SFA.
*Zinc dialkylthiophosphate	ELC, ORO, TNA, TX.
Zinc dialkylphenol dithiophosphate	ORO.
Zinc hydrocarbon dithiophosphate	X.
Phosphorodithioates used as lubricating oil and grease additives, all other	ELC, TX.
SUCCINIMIDES:	
Alkanyl succinimide	TX.
N,N-di(C <sub>15</sub> -C <sub>20</sub> )-sec-Alkylasparagine	TX.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*LUBRICATING OIL AND GREASE ADDITIVES--CONTINUED	
SUCCINIMIDES--CONTINUED	
Dodecenyloleyl succinimide	SM.
N-2-Hydroxyethyl-n-tetradecenyl succinimide	TX.
Polyisobutene succinimide, polypropylene glycol salt	SM.
*SULFUR COMPOUNDS:	
Aliphatic hydrocarbon sulfides	ELC, FER, X.
Aliphatic amides, sulfur compounds	ORO.
Chlorosulfurized sperm oil	ELC.
Diisobutylene polysulfide	TX.
Di-tertiary nonylpolysulfide	PAS.
Phosphosulfurized terpene	SM.
Sulfurized lard oil	CMW, FER, QCP, WBG.
Sulfurized sperm oil substitutes	CCW, ELC, FER.
Sulfur compounds, all other	CCW, ELC, INA, TX.
ALL OTHER LUBRICATING OIL AND GREASE ADDITIVES:	
Alkene thiophosphate	TX.
Alkyl imidazoline	ORO.
Aminonaphthalenic acid salts	SHC.
Butadiene styrene copolymer	PLC.
Dimer acid esters and polyesters	EMR.
Dodecenyloleyl succinic acid, benzotriazole salt	SM.
Ethylene-propylene copolymer	ORO.
Oleic acid, tosyltriazole salt	SM.
Oxidized hydrocarbon mixture	ALX, X.
Lubricating oil and grease additives, all other	ELC, ENJ, HCC, SM, TX, WTC, X.
*PAINT DRIERS, NAPHTHENIC ACID SALTS:	
Barium naphthenate	CCA.
Cadmium naphthenate	CCA.
*Calcium naphthenate	FER, HN, MCI, TRO, WTC.
Chromium naphthenate	MCI.
*Cobalt naphthenate	CCA, FER, HN, MCI, SHP, TRO, WTC.
Iron naphthenate	HN, MCI.
*Lead naphthenate	CCA, FER, HN, MCI, SHP, SW, TRO, WTC.
Lithium naphthenate	CCA.
*Manganese naphthenate	CCA, FER, HN, MCI, SM, SW, TRO, WTC.
*Zinc naphthenate	CCA.
Paint driers, naphthenic acid salts, all other	CCA, FER, HN, MCI, SM, TRO, WTC.
*Zinc naphthenate	MCI, SHP, SM.
*PHOTOGRAPHIC CHEMICALS:	
N-(2-acetamidophenethyl)-1-hydroxy-2-naphthamide	X.
3-Amino-1,2,4-triazole (5-Amino-1,3,4-triazole)	FMT.

TABLE 2. -- MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*PHOTOGRAFIC CHEMICALS--CONTINUED	
Benzotriazole	FMT.
3-Chloro-4-diethylaminobenzenediazonium chloride (p-Diazo-2-chloro-N,N-diethylaniline zinc chloride)	ESA.
Chlorohydroquinone	EK.
4,4'-Disazo-dibenzal methyl cyclohexanone	FMT.
4-Diazo-2,5-dithoxy morpholinobenzene	ESA.
4-Diazo-3,5-dithoxythiocresol salts	FMT.
2,5-Diethoxy-4-morpholinobenzenediazonium chloride	ALL, ESA.
*p-Diethylaminobenzenediazonium chloride (p-Diazo-N,N-diethylaniline zinc chloride)	ALL, ESA, FMT.
N,N-Diethyltoluene-2,5-diamine, monohydrochloride	EKT.
*N-Diethylaminobenzenediazonium chloride (p-Diazo-N,N-diethylaniline zinc chloride)	ALL, ESA, FMT.
p-Diphenylaminediazonium sulfate	ESA, FMT.
p-(N-Ethylbenzimid)obenzenediazonium chloride (p-Diazo-N-ethyl-N-ethylaniline)-zinc chloride	ESA.
p-[ethyl(2-hydroxyethyl)amino]benzenediazonium chloride (p-Diazo-N-hydroxyethylaniline zinc chloride)	ESA, FMT.
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	WAY.
Hydroquinone (Hydroquinol)	EKT.
p-[(2-Hydroxyethyl)methylamino]benzenediazonium chloride (p-Diazo-N-hydroxyethyl-N-methylaniline)-zinc chloride	ESA, FMT.
2-Hydroxynaphthoic ethylamide	X.
4-Methoxy-1-naphthol	FMT.
p-Methylaminophenol sulfate (Metol)	EK.
5-Methylbenzotriazole	EK.
5-Methyl-1,7-dihydroxy-1,3,4-triazaindolizine	FMT.
4,4-Methylidene-bis-[p-sulfo]phenyl]-3-methylpyrazolone	FMT.
4-Methyl-1-phenyl-3-pyrazolone	WAY.
p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	ALL.
6-Nitrobenzimidazole	FMT.
Phenyl-3-mercaptotetrazole	FMT.
1-Phenyl-3-pyrazolone	EK.
4-N-(1-Pyridyl)-m-toluenediazonium chloride	ALL, ESA.
Photographic chemicals, all other	DIX, DUP, EK, FMT, WAY, X.
POLYMERADJUVANTS:	
Poly- $\alpha$ -olefins	CO, SM.

TABLE 2. -- MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*POLYMERS FOR FIBERS:	
Cellulose acetate	: CEL, EKT, MIL.
Copolyurethane urea	: DUP.
*Hylon 6 (Polymer for fiber, only) and 6/6-	: AFF, DUP, FND, FRF, MON, SKP
Polyacrylonitrile and acrylonitrile copolymers	: ACY, DUP, MON.
*Polyethylene terephthalate	: DUP, EKT, FND, FRF, GYR, MON.
Poly-m-phenylene isophthalamide	: DUP.
Poly-p-phenylene terephthalamide	: DUP.
Polymers for fibers, all other	: EKT, MON, SYT.
*POLYMERS, WATER SOLUBLE:	
*CELLULOSE ETHERS AND ESTERS:	
Hydroxyethylcellulose	: HPC, UCC.
Methylcellulose	: DOM.
Sodium carboxymethylcellulose (100%)	: BUK, HPC, MAK.
Cellulose ethers and esters, all other	: HPC, UCC.
Ethyl acrylate methacrylic acid copolymer	: ALC.
*Polyacrylamide	: ACY, BKM, DA, DOM, HPC, MRK, X.
*POLYACRYLIC ACID SALTS:	
Adipic acid-crosslinked polyacrylamide	: S.
Polyacrylate methacrylate copolymers	: BFG, CRN.
Polyacrylate poly(hydroxypropylacrylate) copolymer	: X.
Sodium ammonium polyacrylate and copolymers	: ALC, BAK.
*Sodium polyacrylate	: ALC, BAK, BFG, BKM, DA, MYO, RH, X.
Polyacrylic acid salts, all other	: ALC, DA, X.
Polyacrylonitrile, hydrolyzed	: ALC, BKM.
Polyacrylonitrile, starch hydrolyzed polymer	: GPC, SCP.
Polymethacrylic acid, sodium salt	: ALC, GRD, X.
Poly(1,1'-(methylamino)bis(3-chloro-2-propanol))- tetramethylethylenediamine	: BKM.
Rare sugars	: ONX, PFN.
1-Vinyl-2-pyrrolidone, polymers	: DAN, GAF, UCC.
Polymers, water soluble, all other	: BAK, BKM, CRN, MRK, PFN, X, X.
Silicone greases	: DCC, SPD, SMS.
*TANNING MATERIALS, SYNTHETIC:	
Acrylate emulsions	: MIL.
Mineral oil/surfactant blend	: MIL.
1-Naphthalenesulfonic acid, formaldehyde condensate and salt	: DA.
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	: AKS, DA, GRD, RH.

TABLE 2.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
*TANNING MATERIALS, SYNTHETIC--CONTINUED	
1-Phenol-2-sulfonic acid, formaldehyde condensate	
(Phenol-formaldehyde-sulfonated)	RH.
Polyoxyalkylated cyclic amines	MIL.
Tanning materials, synthetic, all other	DA.
*TEXTILE CHEMICALS, OTHER THAN SURFACE-ACTIVE AGENTS:	
N,N-Dibenzylhydroxylamine	CCC.
Dicyanodiamide formaldehyde ammonium chloride polymer	CCC, DAM, RPC.
Dimethyloldihydroxyethylene urea	CCC, CHP, DAK, RPC.
N,N'-Diphenyl-1,2-propanediamine	CCC.
N,N-Ethylene urea formaldehyde resin	CCC.
Product from the reaction of stearyl nitrite, candellilla wax, paraformaldehyde, phosphorous trichloride, and picoline	CCC.
Tri(benzyloxymethyl)trimethoxymethylmelamine	DUF.
Urea formaldehyde resin/surfactant blend	MIL.
*Urea polymers with formaldehyde and methanol	CCC, MIL, RPC.
Textile chemicals, other than surface active agents, all other	CCC, CHP, DA, DUP, REC.
*UREA, BY END-USE MARKETS:	
Urea, primary solution (Report on 100% urea-content basis)	ACS, AGY, APD, ARM, BNP, BOR, CAC, CFA, CFI, CHN, CNC, FRI, GCC, GPI, HKY, HPC, MSC, OMC, PLC, SMP, SNI, SOH, TER, TRI, TVA, UOC, VLN, WLC, WYC, X.
*UREA IN COMPOUNDS OR MIXTURES (100% BASIS):	
*Urea in feed compounds (100% Basis)	AGY, APD, CAC, SNI, SOH, TER, TRI, VLN, WYC.
*Urea in liquid fertilizer (100% Basis)	ACS, AGY, ARM, BNP, CFA, CFI, CHN, CNC, FRI, GPI, HKY, HPC, MSC, ORO, PLC, SMP, SNI, SOH, TER, TRI, TVA, VLN, WLC, X.
*Urea in plastics (100% Basis)	BOR, OMC, SOH, TRI.
*Urea in solid fertilizer (100% Basis)	AGY, APD, CAC, CFA, CFI, CNC, FRI, GCC, HPC, MSC, OMC, SOH, TER, TRI, TVA, UOC, VLN, WLC.
*Urea in compounds and mixtures (100% Basis), all other	BAP, PFN, SOH, TER, WYC.
AMINO ACIDS AND THEIR SALTS:	
*METHIONINE AND ITS SALTS:	
Methionine (animal feed grade)	DGC.
Methionine, hydroxy analogue, calcium salt	DUF, MON.
Amino acids and salts, all other	BRS, IHC, MRK, PFN.
Glutamic acid hydrochloride	LEM.
Glycine (Aminoacetic acid), non-medical	CHT.
Levodopa (antiparkinsonian)	MON.
Potassium glutamate	LEM.

TABLE 3.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of miscellaneous end-use chemicals to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
ACS	Allied Corp., Allied Chemical Co.	FER	Ferro Corp.:
ACY	American Cyanamid Co.		Ferro Chemical Div.
AGY	Agway, Inc., Olean Nitrogen Complex		Keil Chemical Div.
AKS	Arkansas Co., Inc.	FMT	Fairmount Chemical Co., Inc.
ALC	Alco Chemical Corp.	FND	Fiber Industries, Inc.
ALD	Aldrich Chemical Co., Inc.	FOR	Formiso Plastics
ALL	Alliance Chemical Corp.	FRF	Firestone Tire & Rubber Co., Firestone
ALX	Alox Corp.		Fibers & Textiles Co.
APD	Atlas Powder Co. Sub. of Tyler Corp.	FRI	Farmland Industries, Inc.
ARM	USS Steel, Agri-Chemicals Div.		
ATR	Atlantic Richfield Co., Arco Chemical Co.	GAF	GAF Corp.
BAK	Baker International-Magna Corp.	GBP	GBP Fermentation Industries, Inc.
BCK	Beckman Microbica	GCC	W. R. Grace & Co., Agricultural Chemicals
BFG	B. F. Goodrich Co., B. F. Goodrich Chemical Group		Group, Memphis Plant
		GCM	Cardinal Chemical Co.
BKM	Buckman Laboratories, Inc.	GFS	G. Frederick Smith Chemical Co.
BLZ	Belzak Corp.	GLY	Glyco, Inc.
BNP	Bison Nitrogen Products Co.	GPC	Grain Processing Corp.
BOR	Borden, Inc., Borden Chemical Div.	GPI	Goodpasture, Inc.
BRS	Bristol-Meyers Co.	GRD	W. R. Grace & Co., Polymers & Chemical Div.
BUK	Buckeye Cellulose Corp.	GTL	Great Lakes Chemical Corp.
		GYR	Goodyear Tire & Rubber Co.
CAC	Cominco American, Inc., Camex Operation		
CCA	Interstab Chemicals, Inc.	HCC	Hatco Chemical Corp.
CCC	C.N.C. Chemical Corp.	HGD	Hodag Chemical Corp.
CCW	Carstab Corp.	HKY	Hawkeye Chemical Co.
CEL	Celanese Corp., Celanese Fibers Co.	HMP	W. R. Grace & Co., Organic Chemicals Div.
CFA	Cooperative Farm Chemicals Association	HN	Tenneco Chemicals, Inc.
CPI	CF Industries, Inc.	HPC	Hercules, Inc.
CGY	Ciba-Geigy Corp.	HXL	Hexcel Corp., Hexcel Chemical Products
CHH	CHR. Hansen's Laboratory, Inc.		
CHN	N-ReN Corp., Cherokee Nitrogen Div.	IMC	International Minerals & Chemicals Corp., IMC
CHP	C. H. Patrick & Co., Inc.		Chemicals Group
CHT	Chatten, Inc.		
CNC	Columbia Nitrogen Corp.	JFR	George A. Jeffreys & Co., Inc.
CO	Conoco, Inc.		
CRN	CPC International, Inc., Amerchol Corp.	KCU	Kennecott Minerals Co., Utah Copper Div.
CRT	Creast Chemical Corp.		
		LEM	Napp Chemicals, Inc.
DA	Diamond Shamrock Corp.		
DAN	Dan River, Inc., Chemical Products Div.	MAK	MAK Chemical Corp.
DCC	Dow Corning Corp.	MCI	Mooney Chemicals, Inc.
DGC	Degussa Corp.	MIL	Milliken & Co., Milliken Chemical Co.
DIX	Dixie Chemical Co., Inc.	MLS	Miles Laboratories, Inc., Biotechnology Group
DOL	Castle & Cooke, Inc., Castle & Cooke Foods, Hawaii Pineapple Div.	MMC	EM Industries, Inc., EM Science Div.
		MON	Monsanto Co.
DOW	Dow Chemical Co.	MOR	Marathon Meroo, Co.
DUP	E. I. duPont de Nemours & Co., Inc.	MRK	Merck & Co., Inc.
		MSC	Mississippi Chemical Corp.
		MYO	Mayo Chemicals Co.
EK	Eastman Kodak Co.:		
EKT	Tennessee Eastman Co. Div.		
ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.	NLT	NL Industries, Inc.
EMR	Emery Industries, Inc.	OMC	Olin Corp.
ENJ	Exxon Chemical Americas	OMS	E. R. Squibb & Sons, Inc.
ESA	East Shore Chemical Co.	ONX	Onyx Chemical Corp.
ESX	Easex Industrial Chemicals, Inc., Easex Chemical Corp.	ORO	Chevron Chemical Co.



TABLE 3.--MISCELLANEOUS END-USE CHEMICALS AND CHEMICAL PRODUCTS: DIRECTORY OF MANUFACTURERS, 1981--CONTINUED

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
PAR	Pennzoil Co., Penreco Div.	SOH	Vistron Corp.
PAS	Pennwalt Corp.	SPD	General Electric Co., Silicone Products Dept.
PFN	Pfanstiehl Laboratories, Inc.	SPR	Scientific Protein Laboratories, Inc.
PFZ	Pfizer, Inc.	SW	Sherwin-Williams Co.
PIC	Pierce Chemical Co.	SWS	Stauffer Chemical Co., SWS Silicones Div.
PLB	P-L Biochemicals, Inc.	SYT	Synthron, Inc.
PLC	Phillips Petroleum Co.		
PMP	Premier Malt Products, Inc.	TER	Terra Chemicals International, Inc.
PPG	PPG Industries, Inc.	TER	Terra Nitrogen, Inc.
PTT	Petro-Tex Chemical Corp.	TNA	Ethyl Corp.
		TRI	Triad Chemical
QCP	Quaker Chemical Corp.	TRO	Troy Chemical Corp.
		TVA	Tennessee Valley Authority
RH	Rohm & Haas Co.	TX	Texaco, Inc.
RPC	Millmaster Onyx Group, Kewanee Industries, Inc.		
		UCC	Union Carbide Corp.
RSA	R.S.A. Corp.	UOC	Union Oil Co. of California, Union Chemicals Div.
S	Sandoz, Inc., Colors & Chemicals Div.	UPJ	Upjohn Co.
SCP	Henkel Corp.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SFA	Stauffer Chemical Co., Agricultural Div.		
SHC	Shell Co., Shell Chemical Co. Div.	VLN	Simcal Chemical Co.
SHP	Shepherd Chemical Co.		
SKP	Shakespeare Co., Monofilaments Div.	WAY	Phillip A. Hunt Chemical Corp., Organic Chemical Div.
SM	Mobil Oil Corp.:		
	Mobil Chemical Co.:	WBC	Worthington Diagnostic Div. of Millipore Corp.
	Chemical Coatings Div.	WBG	White & Bagley Co.
	Phosphous Div.	WLC	Agrico Chemical Co.
SMP	J.R. Simplot Co., Minerals & Chemical Div.	WTC	Witco Chemical Co.
SNI	Kaiser Aluminum & Chemicals Corp., Kaiser Agricultural Chemicals Div.	WYC	Wycon Chemical Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 152 reporting companies and company divisions for which permission to publish was not restricted.

## STATISTICAL HIGHLIGHTS

Kenneth J. Conant, III and David G. Michels

The term miscellaneous chemicals as it is used here comprises those synthetic organic products that are not included in the use groups covered by sections I-XIV of this report. They include products that are employed in a great variety of 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 1981 amounted to 95.0 billion pounds, an increase of 0.7 percent, compared with production in 1980. U.S. sales for 1981 totaled 36.1 billion pounds, valued at \$11.7 billion. Compared with 1980, sales quantity decreased 0.2 percent, while sales value increased by 0.6 percent. Production of miscellaneous cyclic chemicals comprised only 2.5 percent of this section's total production.

The group among miscellaneous acyclic chemicals with the greatest volume of production and sales is the halogenated hydrocarbons. Production of chlorinated hydrocarbons (not otherwise halogenated), the largest segment of this group, decreased from 22.9 billion pounds in 1980 to 22.0 billion pounds in 1981, or by 4.3 percent. Sales of chlorinated hydrocarbons declined from 7.5 billion pounds in 1980 to 7.0 billion pounds in 1981, or by 7.0 percent. Production of fluorinated hydrocarbons increased in 1981.



TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1981

[Listed below are all miscellaneous cyclic and acyclic 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 cyclic and acyclic chemicals for which data on production and/or sales were reported and identifies the manufacturers of each]

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION		SALES		UNIT VALUE <sup>1</sup>
	QUANTITY	VALUE	QUANTITY	VALUE	
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 dollars	
Grand total-----	95,039,129	36,082,863	11,744,402		\$0.33
CYCLIC					
Total-----	2,380,733	1,062,456	989,586		.93
Benzoic acid, sodium salt-----	18,010	16,132	11,573		.72
Benzoyl peroxide-----	7,130	7,027	20,603		2.93
Caprolactam-----	927,881	...	...		...
2,6-Di-tert-butyl-p-cresol (BHT):					
Food grade-----	7,714	8,502	10,077		1.19
Tech. grade-----	9,217	8,402	13,975		1.66
Dioxane-----	...	7,434	6,020		.81
Furan derivatives, all other-----	99	69	147		2.13
Hexamethylenetetramine, tech. grade-----	92,111	37,671	14,956		.40
Maleic anhydride-----	293,185	217,052	91,363		.42
α-Pinene-----	102,648	3,276	1,103		.34
β-Pinene-----	45,061	3,298	1,920		.58
Tall oil, chemically modified-----	1,289	...	...		...
Terpene hydrocarbons, monocyclic (Solvenol)-----	51,954	31,042	8,938		.29
All other miscellaneous cyclic chemicals-----	824,434	722,551	808,911		1.12
ACYCLIC					
Total-----	92,658,396	35,020,407	10,754,816		.31
NITROGENOUS COMPOUNDS					
Total-----	7,467,084	2,091,645	1,122,555		.54
Amides, total-----	292,765	109,705	95,351		.87
Acrylamide-----	81,469	...	...		...
All other amides-----	211,296	109,705	95,351		.87
Amines, total <sup>2</sup> -----	1,469,945	493,831	385,911		.78
Butylamines, total-----	57,010	50,879	37,406		.74
n-Butylamine, mono-----	2,278	...	...		...
Di-n-butylamine-----	6,279	5,346	4,700		.88
Tri-n-butylamine-----	1,134	917	1,129		1.23
All other butylamines-----	47,319	44,616	31,577		.71
n-Butylethylamine-----	...	1,628	1,909		1.17
Diethylamine-----	15,932	6,839	5,673		.83
Diisopropylamine-----	5,371	...	...		...
Di-n-propylamine-----	26,439	...	...		...
1,6-Hexanediamine (Hexamethylenediamine)-----	...	33,220	34,325		1.03
Isopropylamine, mono-----	44,474	47,416	24,431		.52
Methylamines, total-----	160,201	95,985	44,157		.45
Dimethylamine-----	77,538	67,138	31,385		.47
Methylamine, mono-----	48,106	...	...		...
Trimethylamine-----	34,557	28,847	12,772		.44
Triethylamine-----	16,084	13,333	13,027		.98
All other-----	1,144,434	244,531	224,983		.92
2-Diethylaminoethyl methacrylate-----	926	...	...		...
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)-----	11,801	9,444	8,521		.90

See footnotes at end of table.

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	SALES			
	PRODUCTION	QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
ACYCLIC--Continued				
NITROGENOUS COMPOUNDS--Continued				
	1,000	1,000	1,000	Per
	pounds	pounds	dollars	pound
Dimethylaminoethyl methacrylate-----	2,846	2,265	4,032	\$1.78
Dimethylaminoethyl methacrylate, methyl chloride, quaternary salt-----	432	431	613	1.42
Ethanolamines, total-----	428,868	381,729	162,830	.43
2,2'-Aminodiethanol (Diethanolamine)-----	150,362	130,138	56,160	.43
2-Aminoethanol (Monoethanolamine)-----	150,367	134,217	55,546	.41
2,2',2''-Nitrilotriethanol (Triethanolamine)-----	128,139	117,374	51,124	.44
Nitriles, total-----	4,084,403	856,420	255,602	.30
Acetonitrile-----	70,825	...	...	...
Acrylonitrile-----	1,996,385	645,325	219,001	.34
2-Methylacetonitrile (Acetone cyanohydrin)-----	1,091,116	45,062	12,219	.27
Nitriles, all other-----	926,077	166,033	24,382	.15
All other nitrogenous compounds-----	1,175,098	237,820	209,695	.89
ACIDS, ACYL HALIDES, AND ANHYDRIDES				
Total-----	12,157,077	1,720,883	685,688	.40
Acetic acid, recovered-----	4,477,012	...	...	...
Acetic acid, synthetic, 100%-----	2,705,109	450,466	79,112	.18
Acetic anhydride, 100%-----	...	114,161	35,876	.31
Acrylic acid-----	560,280	79,279	35,994	.45
Adipic acid-----	...	155,607	81,258	.52
Dodeceny succinic anhydride-----	5,227	5,033	5,175	1.03
Fumaric acid-----	35,209	25,408	13,873	.55
Propionic acid-----	90,325	58,909	16,205	.28
All other acids, acyl halides, and anhydrides-----	4,283,915	832,020	418,195	.51
SALTS OF ORGANIC ACIDS				
Total-----	343,787	264,499	234,226	.89
Acetic acid salts, total-----	30,384	27,072	19,443	.72
Magnesium acetate-----	...	77	120	1.55
Potassium acetate-----	...	3,407	2,399	.70
Sodium acetate-----	19,233	17,710	7,911	.45
Sodium diacetate-----	1,874	1,675	761	.45
Zinc acetate-----	594	482	623	1.29
All other-----	8,683	3,721	7,629	2.05
Calcium neodecanoate-----	85	73	120	1.63
Calcium propionate-----	20,298	...	...	...
2-Ethylhexanoic acid ( $\alpha$ -Ethylcaproic acid) salts, total-----	14,131	12,096	28,128	2.33
Calcium 2-ethylhexanoate-----	1,787	1,705	1,817	1.07
Cobalt 2-ethylhexanoate-----	2,441	2,251	11,075	4.92
Lead 2-ethylhexanoate-----	1,194	1,199	1,229	1.03
Manganese 2-ethylhexanoate-----	871	807	801	.99
Zinc 2-ethylhexanoate-----	1,089	758	847	1.12
Zirconium 2-ethylhexanoate-----	2,484	2,309	5,197	2.25
All other-----	4,265	3,067	7,162	2.34
Maleic acid salts-----	619	564	2,504	4.44
Oxalic acid salts-----	399	394	737	1.87
Sodium formate-----	70,125	...	...	...
Sodium propionate-----	3,862	...	...	....

See footnotes at end of table.

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
<b>ACYCLIC--Continued</b>				
<i>SALTS OF ORGANIC ACIDS--Continued</i>				
Stearic acid salts, total <sup>3</sup>	1,000	1,000	1,000	Per
	pounds	pounds	dollars	pound
Aluminum distearate	99,637	93,798	76,260	\$0.81
Aluminum mono- and tristearates	1,243	1,239	1,495	1.21
Ammonium stearate	809	992	3,323	3.35
Barium stearate	4,118	2,752	2,794	1.02
Calcium stearate	1,026	1,022	963	.94
Magnesium stearate	45,827	44,539	29,088	.65
Zinc stearate	14,927	13,468	11,327	.84
All other	23,251	21,669	19,215	.89
All other salts of organic acids	8,436	8,117	8,055	.99
Total	104,247	130,502	107,034	.82
<i>ALDEHYDES</i>				
Total	8,291,707	2,207,508	284,844	.13
Butyraldehyde	1,004,383	...	...	...
Formaldehyde (37% by weight)	5,720,678	1,848,506	144,443	.08
Isobutyraldehyde	303,142	10,117	2,424	.24
Propionaldehyde	225,700	10,716	3,089	.29
All other	1,037,804	338,169	134,888	.40
<i>KETONES</i>				
Total	3,271,665	2,467,992	687,268	.28
<i>ALCOHOLS, MONOHYDRIC, UNSUBSTITUTED</i>				
Acetone:				
From cumene	1,546,877	1,302,775	276,147	.21
From isopropyl alcohol	597,172	313,648	80,041	.26
2-Butanone (Methyl ethyl ketone)	610,964	584,689	209,394	.36
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	...	23,599	10,620	.45
4-Methyl-2-pentanone (Methyl isobutyl ketone)	217,953	148,514	62,950	.42
4-Methyl-3-penten-2-one (Mesityl oxide)	...	11,609	6,252	.54
All other	298,699	83,158	41,864	.51
Total	15,779,923	8,905,057	1,842,022	.21
Alcohols, C <sub>11</sub> or lower, unmixed, total	14,935,152	8,336,093	1,530,208	.18
Butyl alcohols, total	2,225,261	1,320,949	289,067	.22
n-Butyl alcohol (n-Propylcarbinol)	808,890	426,772	123,093	.29
Isobutyl alcohol (Isopropylcarbinol)	141,955	...	...	...
All other	1,274,416	894,177	165,974	.19
Ethyl alcohol, synthetic <sup>4</sup>	1,317,185	1,255,364	348,525	.28
2-Ethyl-1-hexanol	389,061	227,884	84,480	.37
n-Hexyl alcohol	50,112	26,105	11,747	.47
Isopropyl alcohol	1,669,104	1,025,034	261,453	.26
Methanol, synthetic	8,576,597	4,129,085	389,457	.09
Propyl alcohol (Propanol)	154,044	108,740	36,622	.34
All other	553,788	242,932	108,857	.45
Alcohols, C <sub>12</sub> and higher, unmixed	182,022	73,883	50,291	.68
Mixtures of alcohols, total	662,749	495,081	261,523	.53
C <sub>11</sub> or lower only	112,712	126,524	62,247	.49
C <sub>12</sub> or higher only	512,720	325,608	182,010	.56
All other	37,317	42,949	17,266	.40

See footnotes at end of table.

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
ACYCLIC--Continued				
<i>ESTERS OF MONOHYDRIC ALCOHOLS</i>				
Total-----	5,048,813	2,537,612	1,189,668	\$0.47
Butyl acetates:				
n-Butyl acetate-----	124,457	102,162	41,056	.40
Isobutyl acetate-----	67,287	42,417	14,897	.35
Butyl acrylate-----	318,701	149,168	73,289	.49
tert-Butyl peroxy acetate-----	626	...	...	...
tert-Butyl peroxy-2-ethylhexanoate-----	2,020	1,959	7,220	3.69
tert-Butyl peroxyisopropyl carbonate-----	...	14	112	8.19
tert-Butyl peroxyphthalate-----	1,762	...	...	...
Di(2-ethyl-1-hexyl) maleate-----	1,493	...	...	...
Dilauryl-3,3'-thiodipropionate <sup>5</sup> -----	2,823	2,804	4,807	1.71
Distearyl-3,3'-thiodipropionate-----	2,331	2,609	3,062	1.17
Ethyl acetate (85%)-----	277,066	162,096	46,076	.28
Ethyl acrylate-----	283,465	148,289	66,475	.45
2-Ethyl-1-hexyl acrylate-----	64,666	54,626	31,158	.57
Fatty acid esters, not included with plasticizers or surface-active agents, total-----	23,489	23,284	14,416	.62
Myristyl myristate-----	566	513	800	1.56
All other-----	22,923	22,771	13,616	.60
Methyl methacrylate-----	891,149	276,270	149,074	.54
Phosphorus acid esters, not elsewhere specified-----	78,409	70,178	80,194	1.14
Propyl acetate-----	54,515	52,263	21,477	.41
Vinyl acetate-----	1,935,680	...	...	...
All other-----	918,874	1,449,023	636,355	.44
<i>POLYHYDRIC ALCOHOLS</i>				
Total <sup>6</sup> -----	5,549,983	3,573,043	1,241,382	.35
1,4-Butanediol-----	157,415	...	...	...
Ethylene glycol-----	4,142,740	2,485,428	685,931	.28
Glycerol, synthetic only <sup>7</sup> -----	...	156,804	99,090	.63
Pentaerythritol-----	118,297	106,894	66,184	.62
Propylene glycol-----	472,778	439,205	166,814	.38
Sorbitol (70% by weight)-----	211,670	167,641	86,279	.51
All other-----	447,083	217,071	137,084	.63
<i>POLYHYDRIC ALCOHOL ESTERS</i>				
Total-----	180,552	149,771	94,820	.63
<i>POLYHYDRIC ALCOHOL ETHERS</i>				
Total-----	1,793,031	1,230,984	497,415	.40
2-Butoxyethanol-----	226,932	215,656	85,004	.39
2-(2-Butoxyethoxy)ethanol (Diethylene glycol mono- butyl ether)-----	50,234	39,657	17,416	.44
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)-----	7,840	2,649	1,268	.48
Diethylene glycol-----	364,023	238,892	57,377	.24
Dipropylene glycol-----	46,673	43,790	14,477	.33
2-Ethoxyethanol-----	205,598	85,614	35,103	.41

See footnotes at end of table.



TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
<i>ACYCLIC--Continued</i>				
<i>POLYHYDRIC ALCOHOL ETHERS--Continued</i>				
	1,000	1,000	1,000	Per
	pounds	pounds	dollars	pound
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)-----	31,700	23,670	9,381	\$0.40
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)-----	14,698	...	..	...
2-Methoxyethanol (Ethylene glycol monomethyl ether)---	93,397	88,743	30,642	.35
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)-----	28,555	23,833	9,315	.39
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)-----	26,740	...	...	...
Polyethylene glycol-----	76,566	78,614	40,798	.52
Polypropoxy ethers-----	12,202	10,260	9,781	.95
Polypropylene glycol-----	24,700	16,274	8,707	.54
Tetraethylene glycol-----	23,255	19,371	9,938	.51
Triethylene glycol-----	119,607	106,150	45,361	.43
All other-----	440,311	237,811	122,847	.52
<i>HALOGENATED HYDROCARBONS</i>				
Total-----	23,020,636	7,778,054	1,852,305	.24
Chlorinated hydrocarbons, total-----	22,009,046	7,007,100	1,273,849	.18
Carbon tetrachloride-----	726,481	385,619	48,785	.13
Chlorinated paraffins (C <sub>10</sub> -C <sub>30</sub> ):				
35%-64% chlorine-----	76,087	78,800	29,867	.38
65% or more chlorine-----	18,572	13,580	7,649	.56
Chloroethane (Ethyl chloride)-----	324,275	145,069	61,061	.42
Chloroform-----	405,246	387,747	86,728	.22
Chloromethane (Methyl chloride)-----	405,259	190,504	33,318	.17
1,2-Dichloroethane (Ethylene dichloride)-----	9,973,553	844,869	68,684	.08
Dichloromethane (Methylene chloride)-----	592,043	372,901	82,438	.22
Tetrachloroethylene (Perchloroethylene)-----	690,815	557,659	89,069	.16
1,1,1-Trichloroethane (Methyl chloroform)-----	613,993	625,658	159,706	.26
Trichloroethylene-----	258,182	243,759	48,450	.20
Vinyl chloride, monomer (Chloroethylene)-----	6,873,592	3,045,395	503,729	.17
All other chlorinated hydrocarbons-----	1,050,948	115,540	54,365	.47
Chlorodifluoromethane (F-22)-----	251,719	164,132	179,353	1.09
Dichlorodifluoromethane (F-12)-----	325,479	294,313	177,567	.60
Trichlorofluoromethane (F-11)-----	162,716	134,615	66,474	.49
All other halogenated hydrocarbons-----	271,676	177,894	155,062	.87
<i>ALL OTHER MISCELLANEOUS ACYCLIC CHEMICALS</i>				
Total-----	9,508,397	1,898,672	916,706	.48
2-Butanone peroxide-----	5,131	5,183	10,505	2.03
Carbon disulfide-----	387,742	293,798	41,274	.14
Epoxydes, ethers, and acetals, total-----	7,064,262	1,311,870	396,170	.30
Ethylene oxide-----	4,936,548	343,973	116,526	.34
All other epoxydes, ethers, and acetals-----	2,127,714	967,897	279,644	.29
Hydrocarbons, not elsewhere specified-----	...	4,946	5,548	1.12
Organo-tin compounds-----	26,451	...	...	...
Pine oil, synthetic-----	44,296	46,361	25,577	.55
Phosgene (Carbonyl chloride)-----	1,116,757	...	...	...
Silicone fluids-----	252,275	70,789	157,919	2.23

See footnotes at end of table.

TABLE 1.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: U.S. PRODUCTION AND SALES, 1981--CONTINUED

MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS	PRODUCTION	SALES		
		QUANTITY	VALUE	UNIT VALUE <sup>1</sup>
ACYCLIC--Continued				
<i>ALL OTHER MISCELLANEOUS ACYCLIC CHEMICALS--Continued</i>	<i>1,000</i> <i>pounds</i>	<i>1,000</i> <i>pounds</i>	<i>1,000</i> <i>dollars</i>	<i>Per</i> <i>pound</i>
Sodium methoxide (Sodium methylate)-----	16,018	15,491	10,442	\$0.67
All other miscellaneous acyclic chemicals-----	595,465	150,234	269,271	1.79
<i>MIXTURES NOT SPECIFICALLY ITEMIZED</i>				
Total-----	245,741	194,687	105,917	.54

<sup>1</sup>Calculated from rounded figures.

<sup>2</sup>Statistics exclude production and sales of fatty amines. Statistics on fatty amines are included in the section "Surface-Active Agents."

<sup>3</sup>Statistics exclude production and sales of potassium and sodium stearates. Statistics on these stearates are included in the section "Surface-Active Agents."

<sup>4</sup>Statistics for production of specially denatured alcohol, 209,852,956 wine gallons, and completely denatured alcohol, 20,442,774 wine gallons, for calendar year 1981 are compiled from data supplied by the Bureau of Alcohol, Tobacco, and Firearms. Production of ethyl alcohol for fuel use is estimated to have been 700 million gallons in 1981.

<sup>5</sup>The production data for 1980 were overstated.

<sup>6</sup>Some polyols which are used as intermediates for urethanes have been included in the section "Plastics and Resin Materials."

<sup>7</sup>1981 production of glycerol, both natural and synthetic, was 280 million pounds, as reported by the U.S. Department of Commerce.

TABLE 2. -- MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981

[CHEMICALS FOR WHICH SEPARATE STATISTICS ARE GIVEN IN TABLE 1 ARE MARKED BELOW WITH AN ASTERISK (\*) 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]

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
6-Acetoxy-2,4-dimethyl-1,3-dioxane	GIV.
Acetylcyclohexane sulfonyl peroxide	MTL.
Alkylphenolalkyleneopolyamine formaldehyde copolymer	X.
Alkylphenol formaldehyde condensate, alkoxylated	X.
Alkylphenol formaldehyde copolymer	X.
1-(2-Aminoethyl)piperazine	TX, UCC.
3-Aminopropylcyclohexylamine	ABB.
1-(3-Aminopropyl)morpholine	TX.
Amyl p-dimethylaminobenzoate	VND.
BENZOIC ACID SALTS:	
*Sodium benzoate, U.S.P.	KLM, MAL, PFZ.
*Sodium benzoate, tech.	HCP, HN, PFZ.
Benzoic acid salts, all other	PFZ, SCM.
p-Benzoquinone	EKT.
Benzothiazole	ACY, RCI.
*Benzotriazole, substituted	CGY.
Benzyl peroxide	AZT, CAD, NOC, WTC, WTL.
Benzyl alcohol	KLM, SFS.
Benzyl alkyl pyridinium chloride	BAK.
Benzyl cocoalkyl dimethyl ammonium chloride	BAK.
Bis(2,4-dichlorobenzoyl) peroxide	CAD, WTL.
Bis(2,6-dimethylbenzoyl) peroxide	WTL.
Boron fluoride - Phenol complex	ACS.
Butyl fluoroate	CLN, RPC, TCC.
tert-Butyl cumene hydroperoxide	CAD.
4-tert-Butylcyclohexyl peroxycarbonate	CAD.
tert-Butylhydroquinone	EKT.
2 (and 3)-tert-Butyl-4-methoxyphenol (BHA)	EKT.
tert-Butyl peroxybenzoate	AZI, WTC, WTL.
4-tert-Butylpyrocatechol	BKL, CRZ, DOM.
Camphene	HPC, SCM.
*Caprolactam (2-Oxohexamethylenimine)	APP, CNP, DBC.
Cellulose acetate hexahydrophthalate	X.
Cellulose acetate phthalate	EK.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
1-(3-Chloroethyl)3,5,7-triaza-1-azoniaadamantane chloride	: DOM.
Cresyl glycidyl ether	: WLN.
Cumene hydroperoxide	: CLR, USS, WTC.
Cyanuric acid	: FMB, MON.
Cyclohexane dimethanol diglycidyl ether	: WLN.
Cyclohexanethiol	: PAS.
Cyclohexanone peroxide	: AZT.
CYCLOHEXENE-1,2-DICARBOXYLIC ACID (TETRAHYDROPHTHALIC ACID), DISUBSTITUTED, POLYESTER SALTS:	
Cyclohexene-1,2-dicarboxylic acid	: X.
(Tetrahydrophthalic acid), disubstituted, Polyester salts, tin salt	: EKT.
1,4-Cyclohexylenedimethanol	: OH.
Decabromobiphenyl or ether	: DOM, GTL.
Decahydronaphthalene (Decalin)	: DUP.
Dihydroacetic acid or sodium salt	: EKT, GAN, GLY.
Dialkyl naphthalene	: X.
1,4-Diazobicyclo(2.2.2)octane	: TX, X.
Diazodinitrophenol	: HPC.
2,5-Di(benzyloxy)-2,5-dimethylhexane	: WTL.
2,5-Di- <i>t</i> -butylhydroquinone	: EKT.
2,4-Di- <i>t</i> -butyl phenyl 3,5-di- <i>t</i> -butyl hydroxybenzoate	: FER.
Dichloro-s-triazane-2,4,6 (H, 3H, 5H)trione (Dichloroisocyanuric acids and salts)	: FMB, OMC.
4,4'-Dichloro-3-(trifluoromethyl)carbanilide	: CGI.
N,N'-Diethyl-N,N'-diphenylurea	: VDI.
Di-2-ethylhexyl chloroformate	: VEL.
3,5-Dihydrothiophene-1,1-dioxide (Sulfolene)	: PLC.
2,5-Dihydroxy-3,5-dimethyl-1,2-peroxycyclopentane	: WTC, WTL.
2,2-Dihydroxy-4-methoxybenzophenone	: ACY.
Diiodomethyl- <i>p</i> -tolyl sulfone	: ABB.
Diisopropylbenzene hydroperoxide	: HPC.
Diketene	: BRD, EKT.
<i>p</i> -Dimethylbenzene (Dimethyl ether of hydroquinone)	: ASL, EKT.
4,4-Dinitrocarbanilide-4,6-dimethyl-2-pyrimidinol	: MRK, SDM.
*Dioxane (1,4-Diethylene oxide)	: DOM, FER, UCC.
1,3-Dioxolane	: FER.
2,6-DI- <i>tert</i> -BUTYL- <i>p</i> -CRESOL (BHT):	
*6,6-Di- <i>tert</i> -butyl- <i>p</i> -cresol, (BHT), Food grade	: KPT, SHC, SM, USR.
*2,6-Di- <i>tert</i> -butyl- <i>p</i> -cresol, (BHT), Technical grade	: KPT, SHC, SHX, SM, USR.

CYCLIC--CONTINUED

TABLE 2. -- MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
Dodecylidiphenyl oxide	: X.
4-(Dodecylloxy)-2-hydroxybenzophenone	: EKT.
2-Ethylhexyl benzoate	: TCC.
2-Ethylhexyl p-dimethylaminobenzoate	: VND.
2-Ethylhexyl tallate	: CHP.
Ethylidene norbornene	: UCC.
4-Ethylmorpholine	: TX.
Ferrocene polymer with 2-propanone.in chlorinated wax	: ARA.
FURAN DERIVATIVES:	
2-Furaldehyde (furfural)	: QKO.
Tetrahydrofurfuryl alcohol	: QKO.
*Furan derivatives, all other	: CPS, GLY, SAR.
Galic acid, tech.	: MAL.
Glyceryl p-aminobenzoate	: VND.
Hexabromocyclododecane	: GTL, VEL.
*Hexamethylenetetramine, tech.	: BOR, HKD, HMP, HN, PLS, WCI.
Monomethyl salicylate	: WFC.
Hydrindantan	: PIC.
Hydroquinone, di( $\beta$ -hydroxyethyl) ether	: EKT.
p-Hydroxybenzoic acid, butyl ester	: HN.
p-Hydroxybenzoic acid, ethyl ester	: HN.
p-Hydroxybenzoic acid, methyl ester	: HN, HXL, JEM.
p-Hydroxybenzoic acid, propyl ester	: HN, HXL, JEM.
N-(hydroxyethyl)piperazine	: TCH, TX.
2-Hydroxy-4-methoxybenzophenone	: ACY, GLY.
2-Hydroxy-4-methoxy-5-sulfolobenzophenone trihydrate	: ACY.
2-Hydroxy-4-N-octoxybenzophenone	: ACY.
2-(2-Hydroxy-5-tert-octylphenyl)benzotriazole	: ACY.
1,2,3-Indantrione monohydrate (Ninhydrin)	: PIC.
LACTONES:	
Butyrolactone	: GAF.
caprolactone	: UCC.
glucono- $\delta$ -lactone	: PFZ.
lanolin acetate	: CRN.
lanolin alcohol acetate	: CRN.
lanolin, chemically modified	: CRN.
lanolin oil	: CRN.
lactones, all other	: PFN.
*Maleic anhydride	: APO, ASH, DKA, HN, KPT, MON, RCI, USS.
p-Menthane	: HPC.
6-p-Menthyl hydroperoxide	: HPC.

CYCLIC--CONTINUED

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
4-Methoxyphenol	
Methylaziridine	ASL, EKT.
2,2'-Methylenebis[4-chlorophenol]	ARS.
2,2'-Methylenebis[4-methyl-6-tert-butylphenol]	GIV.
2,2'-Methylenebis[3,4,6-trichlorophenol] (Hexachlorophene)	SM.
4-Methylmorpholine	GIV.
1-Methyl-2-pyrrolidone, monomer	TX.
5-Methyl resorcinol (Orcinol)	GAF.
Methyltetrahydrophthalic anhydride	PD.
Morpholine	MIL.
Morpholine salt of p-toluene sulfonic acid	DOM, TX.
Neopentyl glycol dibenzoate	AMB.
Octabromodiphenyl oxide	VEL.
Oxalyl bis(benzylidene hydrazide)	GTL.
pentacrythitol tribenzoate	EKT.
phenothiazine	VEL.
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	MAG.
2-(2-Phenoxyethoxy)ethanol (Diethylene glycol phenyl ether)	DOM, TCH.
3-Phenyl-7-(1'-diazo-2'-naphthylamine)-coumarin	DOM.
Phenyl glycidyl ether	S.
Phenyl hydrogen phosphate	MLM.
Phenyl mercuric borate	SM.
Phthalic acid, lead salt, (Dibasic)	FER.
Picramic acid, sodium salt	ALI.
Pinane	SDC.
Pinane hydroperoxide	SCH.
2-Pinanol (cis and trans)	SCH.
*g-Pinene	ARS, HPC, NCI, RCI, SCM.
*g-Pinene, sulfate	ARS, HPC.
Pinene, wood	ARS.
Poly-4-(2-acryloxyethoxy)-2-hydroxybenzophenone	HPC.
Poly(dibromophenylene oxide)	ACT.
Polyethylene glycol, $\alpha$ -nonylphenyl ether	GTL, VEL.
Polypropylene glycol glycerol triether and epichlorohydrin bisphenol epoxy resin	BAK.
Propyl gallate	BAK.
Resorcinol diglycidyl ether	EKT.
Resorcinol monobenzoate	MLM.
Resorcinol monobenzoate	EKT.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS		MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
CYCLIC--CONTINUED		
ROSIN ACID SALTS:		
Calcium resinatc		CBY.
Rosin acid salts, all other		ALI.
Stannous octyl phthalate		X.
Styrene oxide		UCC.
Succinic anhydride		ORO.
Sucrose benzoate		VEL.
*Tall oil, chemically modified		ARC.
Tall oil dimer acid, methyl esters		FDC, MVA, ZGL, X.
TALL OIL SALTS (LINOLEIC-ROSIN ACID SALTS):		X.
Calcium magnesium tellate		MCI, SHP.
Calcium tellate		CCA, HN, MCI, X.
Cobalt tellate		HN, MCI, SHP.
Copper tellate		MCI.
Lead manganese tellate		SHP.
Lead tellate		HN, MCI.
Manganese tellate		HN, MCI, SHP.
Tallow alkyl tellate		X.
Zinc tellate		MCI.
Tall oil salts, all other (linoleic-rosin acid salts)		ARC, CBY, GCM, MCI, SHP, TX, MVA.
Tannic acid, U. S. P.		MAL.
*Terpene hydrocarbons, monocyclic (Solvenol)		HPC, NCI, SCM.
Tetrahomobisphenol A		GTL.
n-Tetradecylsuccinic anhydride		HMY, HLL.
1,2,3,4-Tetrahydronaphthalene (Tetralin)		DUP.
Tetrahydrothiophene		PAS.
Tetrahydrothiophene-1,1-dioxide (Sulfolane)		PEC.
[2,2'-thiobis(4-octylphenolate)]-n-butylamine nickel salt		ACY.
Thiophene		CPS, PAS.
Triallyl cyanurate		ACY.
3,4,4'-Trichlorocarbaniide		MON.
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)		MON, OHC.
3,3,5-Trimethylcyclohexanol (m-homomenthol)		ARS.
3,5,5-Trimethyl-2-cyclohexene-1-one (Isophorone)		ENJ, UCC.
2,4,6-Trinitroresorcinol and lead derivative		REM.
Triphenyltin hydroxide		X.
1-Vinyl-2-pyrrolidinone--other copolymers		GAF.



TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
1-Vinyl-2-pyrrolidinone-methylacrylic acid, dimethylamine ethyl ester, copolymer	GAF.
1-Vinyl-2-pyrrolidinone, monomer	GAF.
1-Vinyl-2-pyrrolidinone-vinyl acetate copolymer	GAF.
Cyclic chemicals, all other	ALB, ALD, AMB, ARA, BAK, BKL, BOC, CAD, CGY, CHP, COS, CRN, GMN, DIX, DOM, DUP, EK, EVN, FMT, GAF, GIV, GTL, HEX, HK, KCH, LEM, MIL, MMC, MON, NES, PAC, PD, PEK, PEN, PIC, PBC, REG, SSA, SAR, SBC, SCH, SFS, SK, SH, STC, SW, TCC, TLA, TNA, TMI, TX, USR, VEL, VIK, WCC, WIC, WIL, X, X, X, X.
ACYCLIC	
*NITROGENOUS COMPOUNDS:	
Acetamide hydrochloride	WTC.
Acetamidoethanol (N-Acetyl-ethanolamine)	SBC.
2-Amino-1-butanol	IMC.
2-Aminoethanol hydrochloride	OMC.
2-Aminoethanol (Monoethanol amine) sulfite	EVN.
Aminoethoxyethanol	TX.
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	DOM, UCC.
2-Aminoethyl mercaptoacetate (Monoethanolamine thioglycolate)	EVN.
2-Amino-2-ethyl-1,3-propanediol	IMC.
2-Amino-2-(hydroxymethyl)-1,3-propanediol [Tris(hydroxymethyl)aminomethane]	IMC.
2-Aminomalonate hydrochloride	ABB.
2-Amino-2-methyl-1,3-propanediol	IMC.
2-Amino-2-methyl-1-propanol	IMC.
2-Amino-2-methyl-1-propanol hydrochloride	CCC.
*AMIDES:	
Acetamide	ACS.
*Acrylamide monomer	ACL, DOM, X.
N-2-aminoethyl-N-2-hydroxyethyloleamide	S.
1,1'-Azobisformamide	FMT, OMC, USR.
2-Chloro-N-(hydroxymethyl)-acetamide	SDM.
Coconut oil amide	ARC, FTX.
N,N-Diethyldecylamide	UPV.
N,N-Dimethylacetamide	UPV.
N,N-Dimethylacetosacetamide	DUP, MON.
N,N-Dimethylacetosacetamide	EKT.
Dimethylaminoethylmethacrylate acrylamide	X.
N,N-Dimethylformamide	AIP, DUP.
Erucamide	ARC, HXL, WTC.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*NITROGENOUS COMPOUNDS--CONTINUED	
*AMIDES--CONTINUED	
Erucamide - lauramide	HXL
N,N'-Ethylenebis-oleamide (Oleic acid-ethylene diamine condensate (amine/acid ratio = 1/2))	GLY, WTC
N,N'-Ethylenebis(stearamide)	CCM, GLY, WTC
Ethylmonoethanolamide	DA, GAF
Fish oil fatty acid amide	WTC
Formamide	X
Hexamethyl phosphoric triamide	ALD, X
4-Hydroxy-4-methyl-2-pentanone acrylamide (Diacetone acrylamide)	ACY
12-Hydroxystearamide	CCM
Methacrylamide	DUP
N-Methylacetamide	EKT
N,N'-Methylenebis(acrylamide)	ACY
Oleamide (Octadecene amide)	ARC, HXL, WTC
Oleoylpalmitamide	HXL, X
Ricinolamide	TKL
Stearamide (Octadecane amide)	ARC, WTC
Stearylceramide	HXL
Tallow amide, hydrogenated	ARC
Amides, all other	ALD, AMD, CMP, COS, EK, HAL, HML, HXL, PAC, PIC, S, TX
*AMINES:	
Allylamines	SHC, VGC
1,3-Bis(3-Chloro-2-hydroxypropylamino)propane	S
Bis-hexamethylenetriamine amine	DUP
n-Butylethylamine	AP, PAS, VGC
1-Deoxy-1-(n-octylamino)-D-glucitol	RAA
Di-amine derivatives of dimer acids	SCP
*BUTYLAMINES:	
n-Butylamine, mono	AP, PAS, VGC
sec-Butylamine, mono	PAS
tert-Butylamine, mono	MON
*Di-n-butylamine	AP, PAS, VGC
Diisobutylamine	AP, VGC
*Tri-n-butylamine	AP, PAS, VGC
Di-tert-butylethyldiamine	VGC
Diethylenetriamine	DOM, UCC
*Diisopropylamine	AP, PAS, UCC, VGC
Dimethylaminopropylamine	ABB, TX

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*NITROGENOUS COMPOUNDS--CONTINUED	
*AMINES--CONTINUED	
ETHYLAMINES:	
Diethylamine	AIP, PAS, UCC, VGC.
Ethylamine, mono-	AIP, PAS, UCC, VGC.
Triethylamine	AIP, PAS, UCC, VGC.
Ethylenediamine	DOM, TX, UCC.
(2-Ethylhexyl)amine, mono-	ARC, VGC.
1,6-Hexanediamine (Hexamethylenediamine)	CEL, DUP, MON.
n-Hexylamine	PAS.
3,3'-Iminobispropylamine	TX.
*Isopropylamine	AIP, PAS, UCC, VGC.
*METHYLAMINES:	
Dimethylamine	AIP, DUP, GAF, IMC.
Methylamine, mono-	AIP, DUP, GAF, IMC, X.
Trimethyl amine	AIP, DUP, GAF, IMC.
Mixed Primary T-alkylamines	
tert-Octylamine	RH.
n-Octylamine, mono	VGC.
Pentaerylenehexamine	UCC.
PENTYLAMINES (AMYLAMINES):	
Dipentylamine	PAS.
Pentylamine, mono	PAS.
Tripentylamine	PAS.
Polyalkylene polyamine	X.
1,3-Propanediamine (1,3-Diaminopropane)	TX.
PROPYLAMINES:	
Dipropylamine	AIP, PAS, VGC.
Propylamine, mono-	AIP, PAS.
Tripropylamine	PAS, VGC.
Tetraethylenepentamine	DOM, UCC.
N,N,N',N'-Tetramethyl-1,3-butanediamine	UCC.
Tetramethylethylenediamine	BKM, RH.
Triethylenetetramine	DOM, UCC.
Amines, all other	ALB, ALD, COS, DOM, EK, EKT, HCP, HXL, MIL, MON, PAC, RBC, RSA, SDW, SOL, TX, UCC, USR, X.
Bisperfluoroalkyl phosphate, ammonium salt	DUP.
Bisperfluoroalkylphosphate diethanolamine salt	DUP.
tert-Butyldiethanolamine	PAS.
1-Butyl-3-ethyl-2-thiourea	PAS.
Butyl isocyanate	UPJ, X.
2-Chloro-N,N-diethylethylamine hydrochloride	SOL.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*NITROGENOUS COMPOUNDS--CONTINUED	
*AMINES--CONTINUED	
2-Chloro-N,N-dimethylethylamine (Dimethylamine ethyl chloride)	SOL.
2-Chloro-N,N-dimethylpropylamine hydrochloride	SOL.
3-Chloro-2-hydroxypropyltrimethyl ammonium chloride	DOM.
Choline base	HFT, RH.
Choline bisulfite	WAY.
N-Cocamidopropyl-N,N-dimethyl-N-sodium acetate, ammonium salt	BAK.
Cyanoacetic acid	KF.
1-(2-Cyanoethyl)ethyl urea	GAF.
2-Dibutylaminoethanol	PAS.
Dibutylaminomethanol	X.
1,3-Dibutyl-3-thiourea	ARC.
1,4-Dicyanobutene	DUP.
2-Diethylaminoethanol (N,N-Diethylethanolamine)	PAS, STC, UCC.
2-(2-Diethylaminoethoxy)ethanol	STC, UCC.
2-Diethylaminoethyl acrylate	STC, UCC.
Diethylaminoethyl acrylate, dimethyl sulfate, quaternary salt	BLM, CFS.
*2-Diethylaminoethyl methacrylate	BLM, CFS, DUP.
Diethylazabonyl chloride	GAF.
Diethylhydroxylamine	PAS.
1,3-Diethyl-2-thiourea	PAS.
2-Diisopropylaminoethanol (N,N-Diisopropylethanolamine)	PAS.
Dimer acid isocyanates	DUP.
Dimethylamine epichlorohydrin copolymer	X.
Dimethylamine sulfate	EH.
2-Dimethylaminoethanol hydrochloride	EVN.
*2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	PAS, TX, UCC.
Dimethylaminoethyl acrylate	BLM.
*Dimethylaminoethyl methacrylate	RAC, BLM, CFS, RH.
Dimethylaminoethylmethacrylate, dimethyl sulfate, quaternary salt	BLM, CFS.
*Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	RAC, BLM, CFS.
Dimethylaminomethanol	X.
Dimethylamino-2-propanol	PAS.
1,1-Dimethylhydrazine	OMC, USR.
2,5-Dithiothiourea	GAF.
Dithiooxamide	RBC.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*NITROGENOUS COMPOUNDS--CONTINUED	
*AMINES--CONTINUED	
tert-Dodecylidissuccinamide	CPS, GAF.
*ETHANOLAMINES:	
*2,2'-aminodisethanol (Diethanolamine)	DOM, OMC, TX, UCC.
*2-Aminoethanol (Monoethanolamine)	DOM, GLY, OMC, TX, UCC.
*2,2',2''-Nitrilotriethanol (Triethanolamine)	DOM, OMC, TX, UCC.
2-Ethylaminoethanol (Ethylmonoethanolamine)	PAS, UCC.
Ethyl cyanoacetate	KF.
5-(N-Ethyl-N-hydroxyethylamino)-2-pentanone	SDM.
Glycine ethyl ester hydrochloride	SFS.
Hexamethylenediamine adipate (Nylon salt)	CEL, DUP, MON.
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tris-Iminodiacetic acid)	IMC.
Iminodiacetic acid	HMP.
ISOPROPANOLAMINES:	
1-Amino-2-propanol (Monoisopropanolamine)	DOM.
1,1'-Iminodi-2-propanol (Diisopropanolamine)	DOM, X.
1,1',1''-Nitrilotri-2-propanol (Triisopropanolamine)	DOM.
2-Isopropylaminoethanol	PAS.
Isopropyl ethylthiocarbamate	ESX.
Ketamine, tetrafunctional	SM.
3-Methoxypropylamine	ABB, TX.
2-Methylaminoethanol (N-Methylethanolamine)	PAS, UCC.
Methyl carbamate	BKL.
Methyl cyanoacetate	KF.
Methyl $\alpha$ -cyanoacrylate	EKT.
2,2'-(Methylimino)diethanol (Methyldiethanolamine)	DOM, PAS, UCC.
Methyl isocyanate	UCC.
Nitrated lard oil	SM.
*NITRILES:	
*Acetonitrile	DUP, MON, SOH, X.
*Acrylonitrile, monomer	ACY, DUP, MON, SOH.
Adiponitrile	DUP, MON.
n-Butyronitrile	EKK, MIT.
3-Ethoxypropionitrile	DIX.
2-Ethylhexyl nitrile	X.
Ethyl methyl ketone aminonitrile	HMP.
Glycolonitrile	KF.
Isobutyronitrile	AIP, EKK.
Lactonitrile	MON.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1961--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*NITROGENOUS COMPOUNDS--CONTINUED	
*NITRILES--CONTINUED	
Methacrylonitrile	DOM
3-Methoxypropionitrile	ABB
Methylisobutyl ketone aminonitrile	HMP
*2-Methylacetonitrile (Acetone cyanohydrin)	CVR, DUP, MON, RH
Propionitrile	MON
Stearonitrile (Octadecane nitrile)	SEC, SHX
Tallow nitrile	SHX
Tallow nitrile, hydrogenated	SHX, WIC
3,3'-Thiodipropionitrile	EVN
Vinylacetonitrile	REC
Nitriles, all other	ALD, COC, DUP, HMP, TNA, X
Nitroethane	IMC
Nitromethane	IMC
1-Nitropropane	IMC
2-Nitropropane	IMC
Octadecyl isocyanate	MOB
Pentaerythritol tetranitrate	DUP, HFC
n-Propylaminoethanol	PAS, X
n-Propyl carbamate	BKL
n-Propyldiethanolamine	PAS
Propylisocyanate	HPC
Sarcosine (N-Methylaminoacetic acid)	HMP
Semicarbazide hydrochloride	FMT
Tetramethylguanidine	ACY
Thiosemicarbazide	FMT
Trimethyl aminoethyl ethanalamine	EKT
Nitrogenous compounds, acyclic, all other	RAC, ABB, ALB, ALD, AMD, BKL, EK, EVN, FKE, HEX, HLI, OMC, PAS, PEL, PFN, PFZ, PIC, RBC, REG, REM, RH, SBC, SCP, SK, SOL, STC, TKL, TX, UCC, VAL, X, X, X, X, X
*ACIDS, ACID ANHYDRIDES, AND ACYL HALIDES:	
ACETIC ACID, 100%:	
Acetic acid, recovered (100%)	AIP, CEL, EKT, MON, RDA, UCC, USI
Acetic acid, synthetic (100%)	ARC, BOR, CEL, EKT, FMP, MOX, UCC
*ACETIC ANHYDRIDE, 100%:	
Acetic anhydride from acetaldehyde (100%)	EKT
Acetic anhydride from acetic acid, other than recovered, by the vapor-phase process (100%)	CEL, UCC
Acetic anhydride from acetic acid, recovered, by vapor-phase process	CEL
Acetyl chloride	MCC
*Acrylic acid	CEL, DBC, RH, UCC

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ACIDS, ACID ANHYDRIDES, AND ACYL HALIDES--CONTINUED	
Adipic acid	APP, CEL, DUP, MON.
*Azelaic acid	EMR.
2,2-bis(hydroxy-methyl)-propionic acid	IMC.
Bromocetyl bromide	MCC.
Bromobutyric acid	GIL.
tert-Butylperoxy maleic acid	MTC, WFL.
Butyric acid	MTC, EKT, EKX.
Butyric anhydride	CEL, EKT, EKX.
Butyryl chloride	MCC.
<i>β</i> -Carbomethoxypropionyl chloride (Mono-ethyl malonate acid chloride)	MCC.
Castor oil fatty acids, dehydrated	ABB.
Chloroacetic acid, mono	MTL.
Chloroacetyl chloride	BUK, DOM, PFZ.
α-Chloropropionic acid, mono	DOM, MON.
Citric acid	DOM.
Crotonic acid (2-Butenoic acid)	MLS, PFZ.
Decanoyl chloride	EKT.
2,2-dichloroacetyl chloride	WFL.
Diox acid (C-36 aliphatic dibasic acid)	RDA.
Dithiodipropionic acid	CBY, EMR.
Dodecanoic acid	FUN.
*Dodecylsuccinic anhydride	DUP.
2-Ethylbutyric acid (Diethylacetic acid)	BCG, DIX, HMY, MIL, X.
2-Ethylhexanoic acid (α-Ethylcaproic acid)	UCG.
Fatty acids, hydrogenated	EKT, UCC.
Fatty acids, partially hydrogenated	MCC, MTL.
*Formic acid, 90%	Gly.
Fumaric acid	Gly, SHX.
Gluconic acid, technical	Gly, MON, UCC.
Glutaric anhydride	AGC, HN, MON, PFZ, USS.
Glycolic acid (Hydroxyacetic acid)	PFZ.
Heptanoic acid	DUP.
n-Hexadecylsuccinic anhydride	CEL.
Isoethionic acid (2-Hydroxyethanesulfonic acid)	HMY.
Isoascorbic acid (Erythorbic acid)	MTC.
Isobutyric acid	PFZ.
Isobutyric anhydride	EKT.
Iso-octadecenoic acid	EKK.
Iso-octadecylsuccinic anhydride	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
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	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
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	AGC, HN, MON, PFZ, USS.
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	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
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	CEL, MON, UCC.
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	AGC, HN, MON, PFZ, USS.
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	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
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	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
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	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.
	PFZ.
	EKT.
	EKK.
	CEL, MON, UCC.
	AGC, HN, MON, PFZ, USS.
	PFZ.
	DUP.
	CEL.
	HMY.
	MTC.



TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ACIDS, ACID ANHYDRIDES, AND ACYL HALIDES--CONTINUED	
Itaconic acid (Methylenesuccinic acid)	: PFZ.
Lactic acid, edible, 100%	: CLM, MON.
lauroyl chloride	: MCC, WTL.
levulinic acid	: CCA, SOL.
Maleic acid	: ACS, PFN, PFZ.
Malic acid	: AGC.
Mercurioacetic acid (Thioglycolic acid)	: EVN.
3-Mercaptopropionic acid	: EVN.
Mercaptosuccinic acid (Thiomalic acid)	: EVN.
Methacrylic acid	: DUP, RH.
Methanesulfonic acid	: PAS.
Methanesulfonyl chloride	: PAS.
Neodecanoic acid	: ENJ.
Neopentanoic acid	: ENJ.
Nonanoic acid (Pelargonic acid)	: CEL, EMR, GIV.
Nonenylsuccinic anhydride	: HMY.
Octanoyl chloride	: MCC.
Oleic acid	: ARC, GLY.
Oxalic acid	: CCC, HRT.
Oxidized fisher tropsch wax	: ACS, HK.
Palmitoyl chloride	: SMH, X.
Peroxyacetic acid	: MCC, X.
Pivaloyl chloride	: PHB, UCC.
Polyacrylic acid	: AZI, COC, MCC.
*Propionic acid	: BFG, DA, RH, SNW.
Propionic anhydride	: CEL, EKT, UCC.
Sebacic acid	: EKT.
Sebacoyl chloride	: WTH.
Sorbic acid (2,4-Hexadienoic acid)	: WTL.
Stearoyl chloride	: MON.
Succinic acid	: MCC.
Tallow fatty acid	: ACS.
Thioacetic acid	: ARC.
3,3'-Thiodipropionic acid	: EVN.
Thiolactic acid	: EVN.
Valeric acid	: UCC.
Acids, acid anhydrides, and acyl halides, all other	: AID, AMD, BCC, COC, CRN, EK, ENJ, EVN, HMY, PD, PIC, SM, TV, UCC, MCC, WTL, MVA, X.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS	
ACYCLIC--CONTINUED	
*SALTS OF ORGANIC ACIDS:	
*ACETIC ACID SALTS:	
Aluminum acetate	: NCC.
Ammonium acetate	: ACS, BKC.
Barium acetate	: BKC.
Butyltin acetate (Dibutyltin diacetate)	: COS, X.
Calcium acetate	: ACS, HFT.
Chromium acetate	: SHP.
Cobalt acetate	: HSH, UCC.
Copper acetate	: BKC.
Lead acetate	: BKC.
Lead subacetate	: BKC.
Magnesium acetate	: BVC, HCP, SHP.
Manganese acetate	: HSH, SHP.
Mercuric acetate	: COS.
Nickel acetate	: BKC, HSH, SHP.
*Potassium acetate	: ACS, BKC, HCP, NCC, X.
*Sodium acetate	: ACS, ATC, BKC, DAN, EKT, HCP, MAL, NCC.
*Sodium diacetate	: HCP, MAL, NCC.
*Zinc acetate	: ACS, BKC, CCC, NCC, SHP.
Zirconium acetate	: CCC, IZC.
Acetic acid salts, all other	: DA, SHP, X.
Adipic acid, ammonium salt	: SOL.
Allylsulfonic acid, sodium salt	: IOC.
CITRIC ACID SALTS:	
Ammonium citrate	: PFZ.
Calcium citrate	: PFZ.
Ferric ammonium citrate	: PFZ.
Potassium citrate	: HXL, MLS, PFZ.
Sodium citrate	: HXL, MLS, PFZ.
Citric acid salts, all other	: X.
*2-ETHYLHEXANOIC ACID (ALPHA-ETHYLCAPROIC ACID) SALTS:	
Aluminum 2-ethylhexanoate	: DA, WTC.
Barium 2-ethylhexanoate	: CCA.
Bismuth 2-ethylhexanoate	: SHP.
Cadmium 2-ethylhexanoate	: CCA.
*Calcium 2-ethylhexanoate	: CCA, COS, FER, HN, MCI, TRO, WTC.
*Cobalt 2-ethylhexanoate	: CCA, COS, FER, HN, MCI, SHP, TRO, WTC.
Copper 2-ethylhexanoate	: CCA.
Dibutyltin di-2-ethylhexanoate	: COS.
Iron 2-ethylhexanoate	: CCA, HN.
*Lead 2-ethylhexanoate	: CCA, COS, FER, HN, SHP, TRO, WTC.

TABLE 2. -- MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*SALTS OF ORGANIC ACIDS--CONTINUED	
*2-ETHYLHEXANOIC ACID (ALPHA-ETHYLCAPROIC ACID)	
SALTS--CONTINUED	
*Magnesium 2-ethylhexanoate	CGA, FER, HN, MCI, TRO, WTC.
Nickel 2-ethylhexanoate	MCI, SHP, WTC.
Potassium 2-ethylhexanoate	CGA, MCI, WTC.
Rare earths 2-ethylhexanoate	CGA, MCI
*Stannous 2-ethylhexanoate	FER, WTC.
*Zinc 2-ethylhexanoate	CGA, COS, FER, HN, MCI, OMC, SHP, WTC.
*Zirconium 2-ethylhexanoate	CGA, COS, FER, HN, MCI, TRO, WTC.
2-Ethylhexanoic acid salts, all other	CGA, COS, FER, HN, MCI, SHP.
FORMIC ACID SALTS:	
Potassium formate	HCP.
*Sodium formate, refined	BKC.
*Sodium formate, technical	CEL, IMG, PST.
Formic acid salts, all other	IMC.
Fumaric acid, lead salt	ALI.
GLUCOHEPTANOIC ACID SALTS:	
Calcium glucoheptanoate	PFN.
Sodium glucoheptanoate	PFN, RPC.
Glucoheptanoic acid	PFN, RPC.
GLUCONIC ACID SALTS:	
Sodium gluconate	PFN, PFZ, SFI.
Humic acids, sodium salts	X.
Isoascorbic acid, sodium salt (Sodium erythorbate)	PFZ.
Ivanolin acid, barium salt	CRN.
Mercaptopropionic acid, dibutyltin salt	GCH.
Potassium glycolate	X.
Sodium glycolate	HCP.
TERTIARY-ALPHA-ALKYLICARBOXYLIC ACID SALTS (ISOCARBOXYLIC ACID SALTS):	
Calcium t- $\alpha$ -alkylcarboxylate	MCI.
Cobalt t- $\alpha$ -alkylcarboxylate	MCI.
Iron t- $\alpha$ -alkylcarboxylate	MCI.
Isononanoic acid, lead salt	CCB.
Lead t- $\alpha$ -alkylcarboxylate	MCI.
Manganese t- $\alpha$ -alkylcarboxylate	MCI.
t- $\alpha$ -Alkylcarboxylic acid salts (Isocarboxylic acid salts), all other	HCP, MCI.
LACTIC ACID SALTS:	
Sodium lactate (Nalac)	PFN.
Lactic acid salts, all other	PFN, SM.
LAURIC ACID SALTS:	
Dibutyltin dilaurate	GCH.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*SALTS OF ORGANIC ACIDS--CONTINUED	
LAURIC ACID SALTS--CONTINUED	
lauric acid, barium-cadmium salt	FER.
lauric acid salts, all other	FER, X.
LINOLEIC ACID SALTS:	
Calcium linoleate	CCA, WTC.
*MALEIC ACID SALTS:	
Dibutyltin maleate	CCA, FER.
Tribasic lead maleate	ALI.
Maleic acid salts, all other	GCM, X.
MERCAPTOACETIC ACID (THIOGLYCOLIC ACID) SALTS:	
Ammonium mercaptoacetate	EVN.
Calcium mercaptoacetate	EVN.
Sodium mercaptoacetate	EVN.
mercaptoacetic acid (thioglycolic acid) salts, all other	CCA.
NEODECANOIC ACID SALTS:	
*Calcium neodecanoate	CCA, MCI, SHP.
Cobalt neodecanoate	MCI, SHP, UCC.
Lead-cobalt neodecanoate	MCI.
Lead neodecanoate	MCI.
Lithium neodecanoate	MCI.
Manganese neodecanoate	MCI, SHP.
Zirconium neodecanoate	MCI, SHP, WTC.
Neodecanoic acid salts, all other	MCI, SHP, WTC.
OCTANOIC-ACID (CAPRYLIC ACID) SALTS:	
Stannous octanoate	GCM.
Octanoic acid (caprylic acid) salts, all other	ALI, WTC.
OLEIC ACID SALTS:	
Calcium oleate	TCC.
Copper oleate	WTC.
oleic acid salts, all other	RPC, SHP.
*OXALIC ACID SALTS:	
Ammonium oxalate	ACS, BKC, HML.
Potassium oxalate	BKC, HML.
Sodium oxalate	BKC, DA, NML.
PALMITIC ACID SALTS:	
Calcium palmitate	SYL.
PHOSPHOROTHIOIC ACID SALTS (DITHIOPHOSPHATES):	
Sodium di-sec-butyl-diethyl phosphorodithioate	ACY.
Sodium di-sec-butyl phosphorodithioate	ACY.
Sodium diethyl phosphorodithioate	ACY.
Sodium dibethyl phosphorodithioate	ACY.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*SALTS OF ORGANIC ACIDS--CONTINUED	
PHOSPHORODITHIOIC ACID SALTS	
(DITHIOPHOSPHATES)--CONTINUED	
Sodium diisopropyl phosphorodithioate	ACY.
Phosphorodithioic acid salts (Dithiophosphates), all other	ACY. ARA.
Cinchonidine mono-Propionate	
PROPIONIC ACID SALTS:	
*Calcium Propionate	HFT, MAL, OCC, PFZ.
*Sodium Propionate	HFI, HAL, PFZ.
Propionic acid salts, all other	DUP.
RICINOLEIC ACID SALTS:	
Lithium ricinoleate	NTL.
Sodium sorbitol borate	ICI.
*STEARIC ACID SALTS:	
ALUMINUM STEARATES:	
*Aluminum distearate	DA, KCH, NOC, SYP, WTC.
*Aluminum monostearate	DA, MAL, NOC, SYP, WTC.
*Aluminum tristearate	NOC, SYP, WTC.
Ammonium stearate	DA, HN, MPG.
*Barium stearate	HN, NOC, SYP, WTC.
Cadmium stearate	WTC.
*Calcium stearate	DA, FER, GCH, HN, MAL, NOC, SYP, WTC.
Cobalt stearate	FER, MCI, SHP.
Ferric stearate	WTC.
Lead stearate	ALI, FER, WTC.
Lead stearate, dibasic	ALI.
*Lithium stearate	NOC, SYP, WTC.
*Magnesium stearate	ALI, DA, HN, HAL, NOC, SYP, WTC.
Nickel stearate	WTC.
Zinc stearate	GCC, DA, FER, HN, MAL, NOC, PLS, SYP, WTC.
Stearic acid salts, all other	MAL, NOC, WTC.
TARTARIC ACID SALTS:	
Potassium sodium tartrate	PFZ.
XANTHIC ACID SALTS:	
Lead salts of menhaden fish oil, c-14 to c-22(lead fishate)	ELC, MCI.
Potassium pentylxanthate	ACY.
Sodium n-butylxanthate	USR.
Xanthic acid salts, all other	PFN.
Salts of organic acids, all other	ALD, ARA, CCA, EK, MON, PD, PIC, RPC, SDH, SOL, STC, MFG, WTC, X.
ALDEHYDES:	
Acetaldehyde	ACS, CEL, EKK, UCC.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ALDEHYDES--CONTINUED	
Acrolein (Acrylaldehyde)	: UCC.
*Butyraldehyde	: CEL, DBC, EKX, UCC.
Chloral (Trichloroacetaldehyde)	: MTO.
Crotonaldehyde	: EKT, UCC.
2-Ethylbutyraldehyde	: UCC.
2-Ethylhexanal (α-Ethylcaproaldehyde)	: EKX, UCC.
2-Ethyl-2-hexen-1-ol (2-Ethyl-3-propylacrolein)	: UCC.
*Formaldehyde (37% HCHO by Weight)	: ARC, BOP, CBD, CEL, DUP, GAF, GOC, GP, HKD, HM, HPC, IMC.
Glutaraldehyde	: MON, RCI, WCL.
Glyoxal	: UCC.
*Isobutyraldehyde	: ACI.
Isopentalddehyde, mixed isomers	: CEL, DBC, EKX, UCC.
*2-Methylvaleraldehyde (2-Methylpentaldehyde)	: UCC.
*Propionaldehyde	: CEL, EKX, UCC.
Valeraldehyde (Pentanal)	: UCC.
Aldehydes, acyclic, all other	: RDA, UCC.
*KETONES:	
*Acetone from cumene	: AFP, CLK, DOM, GE, GP, GYR, MON, SHC, SKO, SOC, UCC.
*Acetone from isopropyl alcohol	: USS.
Acetone, all other	: EKT, ENJ, SHC, UCC.
*2-Butanone (Methyl ethyl ketone)	: ALD, ATR.
5-Chloro-2-pentanone	: ATR, CEL, ENJ, SHC, UCC.
1-Chloro-1-penten-3-one (β-Chlorovinyl ethyl ketone)	: SDW.
Chloro-2-propanone (Chloroacetone)	: ABF.
Diisomyl ketone	: EK, MRK.
Diisopropyl ketone (2,4-Dimethyl-3-pentanone)	: EKT.
2-Heptanone (Methyl amyl ketone)	: EKT.
3-Heptanone (Ethyl butyl ketone)	: UCC.
2,5-Hexanedione (Acetylacetone)	: APS.
*2-Hexanone (methyl butyl ketone)	: EKT.
1-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	: CEL, SHC, UCC.
Isovalerone (Diisobutyl ketone)	: EKT, UCC.
Lactide (3,6-Dimethyl-2,5-dioxanedione)	: CLM.
4-Methoxy-4-methyl-2-pentanone	: SHC.
*5-Methyl-2-hexanone (Methyl isoamyl ketone)	: EKT.
*4-Methyl-2-pentanone (Methyl isobutyl ketone)	: EKT, ENJ, SHC, UCC.
*4-Methyl-3-penten-2-one (Mesityl oxide)	: ENJ, SHC, UCC.
2-Octanone (Hexyl methyl ketone)	: MTH.





TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ALCOHOLS, MONOHYDRIC, UNSUBSTITUTED--CONTINUED	
*ALCOHOLS, C12 OR HIGHER, UNMIXED (95% OR MORE PURE)--CONTINUED	
Iscosanol	: SCP.
1-Octadecanol (Stearyl alcohol)	: CO, CRN, PG.
cis-9-Octadecen-1-ol (Oleyl alcohol)	: SHX.
2-Octyl dodecan-1-ol	: SCP.
1-Tetradecanol (Myristyl alcohol)	: CO.
1-Tridecanol	: ENJ.
2,6,8-Trimethyl-4-nonanol	: UCC.
*MIXTURES OF ALCOHOLS:	
*Alcohol mixtures, other	: CO, CPS, ENJ, SCP, TNA.
*Alcohol mixtures, C-11 or lower only	: CO, CXI, EKK, NCI, SHG, TNA, UCC.
*Alcohol mixtures, C-12 through C-18 only	: CO, PG, SHC, TNA, WTH.
*ESTERS OF MONOHYDRIC ALCOHOLS:	
Acrylic monomers, mixed	: AAC.
C8-C18 Alcohol esters of fumaric acid	: SM.
Allyl methacrylate	: AAC, BLM, CPS, GLY, SAR, SHC, UCC.
AMYL ACETATES:	
Amyl acetate (n-pentyl acetate)	: UCC.
BUTYL ACETATES:	
*n-Butyl acetate	: CEL, EKT, UCC.
*Isobutyl acetate	: CEL, EKT, EKK, UCC.
Bis(2-bis(2-hydroxyethyl)amino)ethyl)diisopropyl titanate	: DUP.
*Butyl acrylate	: CEL, DBC, RH, UCC.
sec-Butyl chloroformate	: PFG.
3-(2-Butyl)-1-ethyl thiodicarbonate	: ESK.
Butyl maleate	: ICH.
Butyl mercaptopropionate	: EVN.
Butyl methacrylate	: DUP, RH.
tert-Butyl peroxycetate	: AZI, TX, WTL.
tert-Butyl peroxy-2-ethylhexanoate	: AZI, WTC, WTL.
tert-Butyl peroxisisobutyrate	: AZI, WTL.
*tert-Butyl peroxisobutyrate	: CAD, PPG, WTL.
tert-Butyl peroxynodecanoate	: WTC, WTL.
*tert-Butyl peroxypivalate	: AZI, WTC, WTL.
Butyl stearate	: CRN.
Cetylcosyl methacrylate	: RH.
Cetyl lactate	: CYL, SBC, VND.
Decyl methacrylate	: DUP.
Diallyl maleate	: AAC, FMP.
Dibutyl fumarate	: RCI.
Dibutyl maleate	: HN, RCI, TCH, USS.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ESTERS OF MONOHYDRIC ALCOHOLS--CONTINUED	
Diethyl carbonate (Ethyl carbonate)	PPG.
Diethyl dipropylmalonate	ABB.
Diethyl (ethoxymethylene)malonate	KF.
Di(2-ethyl-1-hexyl) chloroformate	ESX, MTC.
*Di(2-ethyl-1-hexyl) maleate	CCC, CHP, CIN, DAN, FTX, RPC.
Diethyl maleate	ACY.
Diethyl malonate (Malonic ester)	KF.
Diethyl oxalate (Ethyl oxalate)	PFZ.
Diethyl thiodicarbonate	ESX.
Diisobutyl maleate	CPS.
Diisobutyl maleate	RPC.
Diisopropyl peroxodicarbonate (Isopropyl percarbonate)	EKY, PPG.
*Dilauryl-3,3'-thiodipropionate	ACY, CCM, EVN.
Dimethyl carbonate	PPG.
Dimethyl maleate	AAC, BLM.
Dimethyl malonate	KF.
*Diocetyl maleate	RCI, USS.
*Distearyl-3,3'-thiodipropionate	ACY, CCM, EVN.
Dithobis(stearyl propionate)	EVN.
Ditridecyl maleate	EFH.
Di(tridecyl)-3,3'-thiodipropionate	ACY, EVN.
Dodecylpentadecyl methacrylate	RH.
2-Ethoxyethyl acetate	EKX, UCC.
*Ethyl acetate (85%)	CEL, EKT, EKX, MON, UCC.
Ethyl acetoacetate	BRD, EKT.
*Ethyl acrylate	CEL, RH, UCC.
Ethyl chloroacetate	SK.
Ethyl chloroformate	ESX, PPG.
1-Ethyl-3-(1,2-dimethylpropyl) thiodicarbonate	ESX.
Ethylene carbonate	TX.
2-Ethyl-1-hexyl acetate	EKT.
2-Ethyl-1-hexyl acrylate	CEL, DBC, UCC.
2-Ethyl-1-hexyl methacrylate	DUP.
2-Ethylhexyl titanate	KF.
1-Ethyl-3-(2-methylpropyl) thiodicarbonate	ESX.
Ethyl silicate	KF, SFS.
Ethyl sulfate (Diethyl sulfate)	UCC.
*FATTY ACID ESTERS, NOT INCLUDED WITH PLASTICIZERS OR SURFACE ACTIVE AGENTS:	
Butyl myristate	CRN.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ESTERS OF MONOHYDRIC ALCOHOLS--CONTINUED	
*FATTY ACID ESTERS, NOT INCLUDED WITH PLASTICIZERS	
*OF SURFACE ACTIVE AGENTS--CONTINUED	
Cetyl palmitate	ARC.
Dimethyl brassylate	EMR.
Hexadecyl stearate	CEL.
Isopropyl linoleate	VND.
Isopropyl myristate	CRN.
Isopropyl palmitate	CRN.
Methyl esters of coconut oil	FTX, PG, WTC.
Methyl esters of tallow	CHL, FER, WTC.
Methyl 12-hydroxystearate	NPL, MTH.
Methyl stearate	CHL, CIN.
*Myristyl myristate	CYL, SEC, VND.
Propyl oleate	CHP.
Tridecyl stearate	CIN, RPC.
Fatty acid esters, not included with plasticizers	
surface-active agents, all other	: ALD, CBY, CCM, CRN, CYL, FER, RPC, SEC, VND, WTC.
Hexyl acetate	: X.
Hexyl acrylate	: CPS.
Isobutyl acrylate	: UCC.
Isobutyl chloroformate	: PPG.
Isobutyl isobutyrate	: EKK.
Isobutyl methacrylate	: RH.
Isodecyl acrylate	: CPS.
Isodecyl methacrylate	: RH.
Isodecyl thioglycolate	: EVN.
Iso-octyl mercaptacetate	: CCM, EVN, GCM.
Iso-octyl-3-mercaptopropionate	: EVN.
Isopropyl acetate	: EKT, UCC.
Isopropyl chloroformate	: SEC, VND.
Isostearyl neopentanoate	: CPS.
Lauryl acetate	: CYL, VND.
Lauryl lactate	: CPS, RH, TX.
Lauryl methacrylate	: RH.
Laurylstearyl methacrylate	: GAF.
Maleic esters and copolymers	: RDA.
Menthallylidene diacetate	: CPS.
2-Methoxyethyl acrylate	: EKT, GRD, MON.
Methyl acetate	: BRD, EKT.
Methyl acetooacetate	: CEL.
Methyl acrylate, monomer	: SFS.
Methyl butyrate	: MCC.

TABLE 2. --MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ESTERS OF MONOHYDRIC ALCOHOLS--CONTINUED	
Methyl chloroformate	ESX, PPG.
Methyl formate	CEL.
*Methyl methacrylate, monomer	CYR, DUP, RH.
Methyl pivaloylacetate	EKT.
Methyl sulfate (Dimethyl sulfate)	DUP.
Myristyl lactate	VND.
Octadecyl-3-mercaptopropionate	EVN.
*PHOSPHORUS ACID ESTERS:	
2, 2-bis(Chloroethyl)-2-chloroethylphosphonate	SM.
2, 2-bis(Chloroethyl)-1, 3-propanediyl tetra bis chloroethyl phosphite	MIL.
Bis(2-ethylhexyl) hydrogen phosphate	SM.
Bis(2-ethylhexyl)hydrogen phosphite	SM.
Butyl acid phosphate	HK.
Diethyl butylphosphonate	SM.
Diethyl hydrogen phosphite	SM.
Diethyl pyrophosphate	SM.
Diethyl chlorophosphate	SFA.
Diethyl hydrogen phosphite	SM.
Diethyl phosphochlorodithionate	SFA.
Dimethyl hydrogen phosphite	SM.
Dimethyl methylphosphonate	SM.
Dimethyl phosphorodithionate	SFA.
2-Ethylhexyl hydrogen phosphate	SM.
Iso-octyl hydrogen phosphite	SM.
Methyl dihydrogen phosphate	HK.
Mixed dialkyl hydrogen phosphates	ELC.
Mixed dialkyl hydrogen phosphates, amine salts	ELC.
Tetrakis(2-chloroethyl)ethylene diphosphate	OMC.
Trialkyl phosphite	MCB.
Tri(butoxyethyl)phosphate	FMP, SFS, SM.
Tributyl phosphate	SFA, SM.
Triethyl phosphite	MCB, SM.
Triiso-octyl phosphite	SM.
Triisopropyl phosphite	SFA, SM.
Triisobutyl ethyl phosphite	HN.
Tris(2-chloroethyl) phosphate	SM.
Tris(chloroisopropyl)thiophosphate	SM.
Tris(2-ethylhexyl)phosphite	SM.
Phosphorus acid esters, all other	ALD, GAF, HK, MON, SM, USS, X, X.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*ESTERS OF MONOHYDRIC ALCOHOLS--CONTINUED	
Propyl acetate	CEL, EKT, UCC.
Propylene carbonate	TX.
Stearyl methacrylate	RH, TX.
Tetraethyl orthosilicate (Tetraethyl silicate)	UCC.
Tetraethyl silicate, condensed	ADC, UCC.
Tetraoctyl orthosilicate	MON.
TITANIC ACID ESTERS:	
Di(hydroxy)bis(ammoniumlactato)titanium	DUP.
Diisopropyl titanate acetylacetonate	DUP.
Diisopropyl titanate bis(ethyl-3-oxobutanoate)	DUP.
Tetrabutyl titanate	DUP.
Tetraisopropyl titanate	DUP.
Tetrakis(2-ethylhexyl)titanate	DUP.
Tiethanolamine titanate	KF.
Titanic acid esters, all other	DUP, X.
Triethyl orthoacetate	KF.
Triethyl orthoformate	KF.
Triethyl orthoazopionate	KF.
Triethyl orthoacetate	KF.
Trimethyl orthoformate	KF.
*Vinyl acetate, monomer	BOR, CEL, DUP, UCC, USI.
Monohydric alcohol esters, all other	ABB, AND, EK, ESX, FER, HOM, PIC, RBC, REG, SEM, TUL, UCC, USR, VAD, WPG, WTL, X, X.
*POLYHYDRIC ALCOHOLS:	
2,2-Bis(bromomethyl)-1,3-propanediol	DOM.
1,2-(and 1,3)-Butanediol	CEL, DUP.
*1,4-Butanediol	BAS, GAF, X.
2-Butene-1,4-diol	GAF.
2-Butyne-1,4-diol	BAS, GAF.
3-Chloro-1,2-propanediol (Glycerol $\alpha$ -chlorohydrin)	DIX, EKN.
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	DBC, EKK.
*Ethylene glycol	BAS, CAU, CEL, DIX, DOM, EKK, HCF, ICI, NMP, OHC, PPG, SHC, TX, UCC.
2-Ethyl-1,3-hexanediol	UCC.
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	CEL, GLY.
Glycerol, natural	ARC.
*Glycerol, synthetic only	ARC, DOM, FMP, SHC.
1,6-Hexanediol	CEL.
Mannitol	ICI.
3-Mercapto-1,2-propanediol (Thioglycerol)	EVN.

TABLE 2. --MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*POLYHYDRIC ALCOHOLS--CONTINUED	
2-Methyl-2,4-pentanediol (Hexylene glycol)	SHC, UCC.
2-Methyl-2-propyl-1,3-propanediol	BKL
*Pentaerythritol	CEL, HPC, IMC, PST.
*Propylene glycol (1,2-Propanediol)	ATR, DOM, OMC, TX, UCC.
*Sorbitol (70% by Weight)	BRD, EHC, ICI, MRK, PFZ.
Trimethylolethane	IMC.
2,2,4-Trimethyl-1,3-pentanediol	EKK.
Polyhydric alcohols, all other	ALD, EK, EKK, SHC, TX.
ESTERS AND ETHERS OF POLYHYDRIC ALCOHOLS:	
*POLYHYDRIC ALCOHOL ESTERS:	
1,3-Butanediol dimethacrylate	SAR.
2-(2-Butoxyethoxy)ethyl acetate	EKT, UCC.
2-Butoxyethyl acetate	UCC.
1,3-Butyleneglycol diacetate	VAL.
Diethylene glycol adipate	DIX.
Diethylene glycol bozate	OMC.
Diethylene glycol chloroformate	PPG.
Diethylene glycol dimethacrylate	SAR.
Dihydroxyacetone	X.
2-(2-ethoxyethoxy)ethyl acetate	EKT, TKL, UCC.
Ethylene glycol diacetate	EKT.
Ethylene glycol dimercaptoacetate	EVN.
Ethylene glycol dimethacrylate	SAR.
Ethylene glycol hydroxyacetate	CCA.
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol trioleate	WM.
Glycerol diacetate (Diacetin)	ARC, HAL.
Glycerol monoacetate (Monoacetin)	ARC, HAL.
Glycerol monoethioglycolate	EVN.
Glycerol triacetate (Triacetin)	ARC, EKT, UCC.
Glycol adipate	GM.
1,6-Hexanediol diacrylate	CEL, SAR.
Hexylene glycol diacetate	UCC.
Hydroxyethyl acrylate	DOM, RH.
Hydroxypropyl acrylate	DOM.
Hydroxypropyl methacrylate	RH.
2-Methoxyethyl acetate	UCC.
Neopentyl glycol diglycidyl ether	MLN.
Pentaerythritol stearate	GLY, TCH, X, X.
Pentaerythritol tetraacrylate	CEL, SAR, TKL.
Pentaerythritol tetrakis (3-Mercaptopropionate)	EVN.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
ESTERS AND ETHERS OF POLYHYDRIC ALCOHOLS--CONTINUED	
*POLYHYDRIC ALCOHOL ESTERS--CONTINUED	
Polyethylene glycol dimethacrylate	SAR.
Polyethylene polypropylene glycol glyceryl triether maleate	BAK.
Sucrose octa-acetate	HFT, PD.
2-Sulfoethyl methacrylate	DOM.
Tetraethylene glycol diacrylate	CEL, SAR.
Tetraethylene glycol diheptanoate	MM.
Triethylene glycol diacetate	EKT.
Triethylene glycol diacrylate	CEL, HMY, PLC.
Triethylene glycol dimethacrylate	SAR.
Trimethylolpropane triacrylate	CEL, SAR.
Trimethylolpropane trimethacrylate	CEL, SAR.
2, 2, 3-Trimethyl-1, 3-pentanediol monoisobutyrate	EKK.
Tripropylene glycol diacrylate	CEL.
*Polyhydric alcohol esters, all other	BAK, CCM, CEL, CYL, DA, DUP, EVK, PG, RPC, SAR, SK, SAW, TKL, UCC, USB, WM, WTC.
*POLYHYDRIC ALCOHOL ETHERS:	
Bis(2-butoxyethyl)ether (Diethylene glycol di-n-butyl ether)	ASL, FER.
Bis(2-ethoxyethyl)ether (Diethylene glycol diethyl ether)	ASL, FER.
Bis(hydroxyethyl)ether butynediol-	ASL, FER.
Bis[2-(2-methoxyethoxy)ethyl] ether (Tetraethylene glycol dimethyl ether)	EFH, UCC.
Bis(2-methoxyethyl)ether (Diethylene glycol dimethyl ether)	ASL.
*2-Butoxyethanol (ethylene glycol monobutyl ether)	ASL, FER.
*2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	DOM, EKK, OMC, SHC, TX, UCC.
*2-12-(2-Butoxyethoxy)ethoxyethanol (triethylene glycol monobutyl ether)	DOM, EKK, OMC, SHC, TX, UCC.
1-Butoxyethoxy-2-propanol	DOM, OMC, UCC.
Butyl ethers of tetra- and higher ethylene glycols (high boiling)	EKK.
*Diethylene glycol-	BAK, CEL, DIX, DOM, EKK, ICI, NWP, OMC, PFG, SHC, TX, UCC.
*Dipropylene glycol (ethylene glycol dimethyl ether)	ASL, FER.
*Diethylene glycol	ATR, DOM, OMC, TX, UCC.
Diethylene glycol monomethyl ether-	OMC.
*2-ethoxyethanol (ethylene glycol monoethyl ether)	DOM, EKK, ICI, OMC, SHC, TX, UCC.
*2-(2-ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	DOM, EKK, ICI, OMC, SHC, TX, UCC.



TABLE 2. -- MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
ESTERS AND ETHERS OF POLYHYDRIC ALCOHOLS--CONTINUED	
*POLYHYDRIC ALCOHOL ETHERS--CONTINUED	
*2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (triethylene glycol monoethyl ether)--	DOM, OMC, UCC.
Ethylene glycol di-tributyl ether--	EKX.
Ethylene glycol di-triethyl ether--	EKX.
Ethylene glycol ethers, mixed--	OMC.
Ethylene glycol monoisobutyl ether--	OMC.
Ethyl ethers of tetra- and higher ethylene glycols (high boiling)--	EKX.
2-[2-(Hexyloxy)ethoxy]ethanol--	OMC, UCC.
1-Isobutoxy-2-propanol (Propylene glycol isobutyl ether)--	DOM.
*2-Methoxyethanol (Ethylene glycol monomethyl ether)--	DOM, OMC, PPG, TX, UCC.
*2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)--	DOM, OMC, PPG, TX, UCC.
*2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)--	DOM, OMC, UCC.
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)--	DUP, UCC.
Methoxypolyethylene glycol--	ASL, OMC, SHX.
1-Methoxy-2-propanol--	DOM.
3-[3-(3-Methoxypropoxy)propanol--	DOM.
Parafomaldehyde--	CEL.
*Polyethylene glycol--	ABB, CAU, DA, DOM, DUP, HDG, ICI, OMC, S, TX, UCC, WTC, X.
Polyethylene glycol dimethyl ether--	X.
Polyethylene glycol mono decyl ether--	BAK.
Polyglycols, ethylene glycol and glycol ether, mixed--	DOM, UCC.
Polymethyvinyl ether monoethylmaleate--	TNI.
Polyoxyalkalene glycol--	OMC.
Polyoxyethylene glycol hydrogenated tallow ester	MPG.
*POLYPROPOXY ETHERS:	
Polypropoxybutyl ether--	DA, TX, UCC.
Polypropoxy ethers, all other--	DUP, ICI, TX, UCC.
Polyoxypropylene polyoxyethylene glycol, mixed	ICI, PEL, UCC.
*Polypropylene glycol--	CXL, DOM, HDG, OMC, PEL, TX, UCC, WTC.
Polypropylene glycol glycerol tri-ether--	BRK.
Polytetramethylene glycol ether--	DUP, QKO.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
ESTERS AND ETHERS OF POLYHYDRIC ALCOHOLS--CONTINUED	
*POLYHYDRIC ALCOHOL ETHERS--CONTINUED	
Poly(1,1,1-trichlorobutane-2-ol)ethylene glycol dextrose ether	OMC.
Propoxyethanol (Ethylene glycol monoethyl ether)	EKK.
Propoxyethoxyethanol (Diethylene glycol monoethyl ether)	EKK.
Propylene glycol, mixed ethers	DOM, UCC.
Propylene glycol monomethyl ether	OMC.
Sorbitol, ethoxylated	GLY, ICI.
Sorbitol, propoxylated	ICI.
*Tetraethylene glycol	DOM, EKK, UCC.
1,1,3,3-Tetraethoxypropane	KF.
2,2'-Thiodiethanol (Thiodiglycol)	MEI.
*Triethylene glycol	CEL, DIX, DOM, EKK, ICI, OMC, SHC, TX, UCC.
Tripropylene glycol	DOM, OMC, UCC.
Tripropylene glycol monomethyl ether	OMC.
Tri- and tetraethylene glycol monoethyl ethers, borate ester s	OMC.
*Polyhydric alcohol ethers, all other	
*HALOGENATED HYDROCARBONS:	
BROMINATED (INCLUDING BROMOCHLORINATED)	
HYDROCARBONS:	
1-Bromobutane (n-Butyl bromide)	WCC.
2-Bromobutane (sec-Butyl bromide)	COC.
Bromo-chlorinated paraffin C <sub>10</sub> -C <sub>20</sub>	FER.
Bromochloromethane	DOM.
Bromoethane (Ethyl bromide)	DOM, GTL.
1-Bromo-octadecane	HMY.
2-Bromopentane (sec-Pentyl bromide)	GTL.
1-Bromopropane (n-Propyl bromide)	WCC.
2-Bromopropane (Isopropyl bromide)	WCC.
Bromotrichloromethane	OMC.
2,2-Dibromo-2-cyanoacetamide	DOM.
Dibromomethane (methylene bromide)	DOM.
1,1,2,2-Tetrabromomethane (Acetylene tetrabromide)	DOM.
Vinyl bromide (Bromomethylene)	TNA.
Brominated (including bromochlorinated) hydrocarbons, all other	ALD, HMY.
*CHLORINATED (NOT OTHERWISE HALOGENATED)	
HYDROCARBONS:	
*Carbon tetrachloride	ACS, DA, DOM, DUP, FRO, LCP, SFI.
CHLORINATED PARAFFINS (C <sub>10</sub> -C <sub>30</sub> ):	
*Chlorinated paraffins, 35-64% chlorine	DA, DVC, FER, ICI, NEV, X.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
MISCELLANEOUS CHEMICALS	
ACYCLIC--CONTINUED	
*HALOGENATED HYDROCARBONS--CONTINUED	
*CHLORINATED (NOT OTHERWISE HALOGENATED)	
HYDROCARBONS--CONTINUED	
CHLORINATED PARAFFINS--CONTINUED	
Chlorinated paraffins, less than 35% chlorine	DA, PVC, FER, NEV.
*Chlorinated paraffins, 45% or more chlorine	PUB, UCC.
1-Chlorobutane (n-Butyl chloride)	DOM, DUP, HPC, PPG, SFP, TNA.
*Chloroethane (Ethyl chloride)	DA, DOM, FRO, LCP, SFI.
*Chloroform	CO, DCC, DOM, LCP, TNA, UCC.
*Chloromethane (Methyl chloride)	COB.
2-Chloro-2-methylpropane (tert-butyl chloride)	FHP.
3-Chloro-2-methyl-1-propene (Methallyl chloride)	DOM, SHC.
3-Chloropropene (Allyl chloride)	ALD, COC, DUP.
1,4-dichlorobutene	TRR.
1,4-dichloro-2-butene	ATR, BFG, CO, DA, DOM, FOR, FRO, OMC, PFG, SFP, SHC, TNA.
*1,2-dichloroethane (Ethylene dichloride)	UCC.
*Dichloromethane (Methylene chloride)	DA, DOM, FRO, LCP, SFI.
1,2-dichloropropane (Propylene dichloride)	DOM, OMC.
2,3-dichloropropane	COC, DOM.
2,2-dimethylchloropropane (neopentyl chloride)	TNA.
Lauryl chlorides	TNA.
*Octyl chloride	TNA.
*Tetrachloroethylene (Perchloroethylene)	DA, DOM, DUP, FRO, PPG, SFI, TNA.
1,1,1-Trichloroethane (Methyl chloroform)	DA, FRO, PFG.
1,1,2-Trichloroethane (Vinyl trichloride)	DOM.
*Trichloroethylene	DOM, PPG, TNA.
1,2,3-Trichloropropane	DOM, SHC.
1,2,3-Trichloropropene	DOM.
*Vinyl chloride, monomer (Chloroethylene)	BFG, BOR, CO, DA, DOM, FOR, GF, MNO, PFG, SFP, SHC, TNA, USR.
Vinylidene chloride, monomer (1,1-dichloroethylene)	DOM, PFG.
Chlorinated (Not otherwise halogenated)	
Hydrocarbons, all other	ALD, RH, TNA, WCC, X.
*FLUORINATED (INCLUDING OTHER FLUOROHALOGENATED)	
HYDROCARBONS:	
Bromotrifluoromethane	DUP, ICI.
1-Chloro-1,1-difluoroethane	PAS.
*Chlorodifluoromethane (F-22)	ACS, DUP, KAI, PAS, RCN.
Chloropentafluoroethane	DUP.
Chlorotrifluoroethylene (Trifluorovinyl chloride)	ACS.
Chlorotrifluoromethane	DUP.
*Dichlorodifluoroethane (F-12)	ACS, DUP, KAI, PAS, RCN.
Dichlorotetrafluoroethane	ACS, DUP, PAS.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
-----	
MISCELLANEOUS CHEMICALS	
-----	
ACYCLIC--CONTINUED	
-----	
*HALOGENATED HYDROCARBONS--CONTINUED	
*FLUORINATED (INCLUDING OTHER FLUORHALOGENATED)	
HYDROCARBONS--CONTINUED	
1,1-difluoroethane	DUP.
Hexafluoropropylene, monomer	DUP.
1-iodoperfluorohexane	DUP.
Polytetrafluoroethylene ethyl iodine	DUP.
Tetrafluoroethylene, monomer	DUP, ICI, SCM.
Tetrafluoromethane	DUP.
*Trichlorofluoromethane (F-11)	ACS, DUP, KAI, PAS, RCN.
Trichlorofluoroethane	ACS, DUP.
Trifluoroethyl trichloromethane sulfonate	OMC.
Trifluoroethyl fluoride, monomer	DUP.
Vinyl fluoride, monomer	PAS.
Fluorinated (including other fluorohalogenated)	
hydrocarbons, all other	DUP, ICI.
*IODINATED (NOT OTHERWISE HALOGENATED) HYDROCARBONS:	
Diiodomethane (Methylene iodide)	MTB, RSA.
Iodoethane (Ethyl iodide), non-medical	COC, FMT, RSA.
Iodoform (Triiodomethane)	MTB.
Iodomethane (Methyl iodide)	COC, DFM, FMT, RSA.
Iodinated (Not otherwise halogenated)	
hydrocarbons, all other	ALD, COC, RSA.
Halogenated hydrocarbons, all other	PEL.
*OTHER MISCELLANEOUS ACYCLIC CHEMICALS:	
Acetyl peroxide	WTL.
Aluminum isopropoxide (Aluminum isopropylate)	GHT, KCH.
*2-Butanone peroxide	CAD, NCC, RCI, MTC, WTL.
tert-Butyl hydroperoxide	AZT, MTC, WTL.
tert-Butyl peroxide (Di-tert-butyl peroxide)	AZT, SHC, WTL.
*Carbon disulfide	FMB, PAS, PPG, SFI.
Decanoyl peroxide	WTC, WTL.
2,3-Dibromopropanol	GTL.
Diethylphosphorous chloride	TNA.
2,5-Dimethyl-2,5-bis(2-ethyl-1-hexanoyl peroxy)hexane	WTL.
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:	
Alkyl glycidyl ethers, C <sub>12</sub> -C <sub>14</sub>	WLN.
Alkyl glycidyl ethers, C <sub>6</sub> -C <sub>10</sub>	WLN.
1-(Allyloxy)2,3-epoxypropane (Allyl glycidyl ether)	AAO, BLM, CFS.
Bis(2-chloroethoxy)methane (Dichloroethylformal)	TKL.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*OTHER MISCELLANEOUS ACYCLIC CHEMICALS--CONTINUED	
*EPOXIDES, ETHERS, AND ACETALS--CONTINUED	
Bis(2-chloroethyl)ether (Dichlorodiethyl ether)	BKM, DOM.
Bis(2-chloro-1-methylethyl)ether (Dichloroisopropyl ether)	DOM.
1,4-Butanediol diglycidyl ether	MLN.
Butylene oxide	DOM.
Butyl ether (Di-n-butyl ether)	PUB.
Butyl glycidyl ether	MLN.
tert-Butyl glycidyl ether	AAC, MLN.
Butyl vinyl ether	GAF.
2-Chloroethyl vinyl ether	AAC.
Chloromethyl methyl ether	RH.
2,2-Dichloro-1,1-difluoroethyl methyl ether	DOM.
Dimercaptodiethyl ether	USR.
Epichlorohydrin	DOM, SHC.
*Ethylene oxide	BAS, CAU, CEL, CO, DOM, EKX, ICI, OMC, PPG, SHC, SNO, TX, UCC.
Ethyl ether, U.S.P.	USI.
Ethyl ether, absolute	FXJ, USI.
Ethyl ether, tech.	PUB, USI.
2-Ethylhexyl glycidyl ether	MLN.
Ethyl vinyl ether	GAF.
Glycidol (2,3-Epoxy-1-propanol)	DIX.
Isopropyl ether	ERJ, SHC.
Methylal (Dimethoxymethane)	CEL.
Methyl ether (Dimethyl ether)	DUP.
Methyl vinyl ether	GAF, UCC.
Propylene oxide	ATR, DOM, OMC, TX.
Epoxides, ethers, acetals, all other	ALD, CCG, CPS, FRE, MMC, PG, UCC, VIK, X, X.
1,2-Ethanedithiol	RBC.
Ethyl chlorothioformate	SFA.
FATS AND OILS, CHEMICALLY MODIFIED:	
Hydrogenated tallow glycerides	CHL, CRN.
Stearic acid glycerides and oxidized stearic acid glycerides	SDM.
Fats and oils, chemically modified, all other	DOM, SM.
Glutaraldehyde bis(sodium bisulfite)	EK, FMT.
Hexachlorodimethyl sulfone	SFS.
n-Hexadecyl disulfide	PAS.
HYDROCARBONS:	
3,3-Dimethylbutene	PLC.
n-Dodecane	HMY, PLC.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*OTHER MISCELLANEOUS ACYCLIC CHEMICALS--CONTINUED	
*HYDROCARBONS--CONTINUED	
Hexadecane	: HMY.
Myrcene	: SCH, X.
n-Nonane	: PLC.
n-Octadecane	: HMY.
n-Octane	: HMY.
Hydrocarbons, all other	: HMY, SCH, SFS.
Lauroyl peroxide	: WTC, WTL.
2-Mercaptoethanol	: MET, PLC.
Methyl sulfide (Dimethyl sulfide)	: CRZ, PAS.
Methyl sulfoxide (dimethyl sulfoxide)	: ALD, CRZ.
ORGANO-ALUMINUM COMPOUNDS:	
Diethylaluminum chloride	: TNA, TSA.
Diethylaluminum iodide	: TNA, TSA.
Diisobutylaluminum chloride	: TNA, TSA.
Diisobutylaluminum hydride	: TNA, TSA.
Ethylaluminum dichloride	: TNA, TSA.
Ethylaluminum sesquichloride	: TNA, TSA.
Isopropenylaluminum	: TSA, X.
Methylaluminum sesquichloride	: TNA.
Triethylaluminum	: TNA, TSA.
Triisobutylaluminum	: TNA, TSA.
Tri-oxylaluminum tri-isopropoxide	: KCH.
Organo-aluminum compounds, all other	: KCH, REH, TNA, TSA.
ORGANO-BORON COMPOUNDS:	
Boron fluoride - ethyl ether complex	: ACS.
Chromium acetylacetonate complex	: HSH, SHP.
Cobalt acetylacetonate complex	: HSH, SHP.
1-Hexyl-1,2-dicarbadodecaborane	: X.
Iron acetylacetonate complex	: HSH, SHP.
N-Methyl-methanamine with borane (1:1)	: X.
2-Methyl-2-propanamine with borane(1:1)	: X.
Triethylborane	: X.
Trimethoxyboroxine	: CLC.
Trimethyl borate	: MHI.
N,N-Trimethyl methanamine octahydrotriborate	: X.
Organo-boron compounds, all other	: ACS, ADG, ALB, PIC, TSA, X.
ORGANO-LITHIUM COMPOUNDS:	
n-Butyllithium	: FTE.
sec-Butyllithium	: FTE.
ORGANO-MAGNESIUM COMPOUNDS:	
Methylmagnesium bromide	: ARA.

TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U. S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
ACYCLIC--CONTINUED	
*OTHER MISCELLANEOUS ACYCLIC CHEMICALS--CONTINUED	
ORGANO-MAGNESIUM COMPOUNDS--CONTINUED	
Methylmagnesium chloride	ARA,
Organic-magnesium compounds, all other	TNA, TSA.
ORGANO-SILICON COMPOUNDS:	
N-( $\beta$ -aminoethyl)- $\gamma$ -aminopropyltriethoxysilane	UCC.
7-Aminopropyltriethoxysilane	UCC.
Amyltriethoxysilane	UCC.
$\alpha$ -Chloropropyltriethoxysilane	DCC.
Chloropropyltrimethoxysilane	DCC.
Chlorotrimethylsilane	DCC.
Dichlorodimethylsilane	DCC.
Dichloromethylsilane	DCC.
Dichloromethylvinylsilane	DCC, UCC.
Ethyltriethoxysilane	UCC.
$\alpha$ -Glycidioxypropyltrimethoxysilane	UCC.
Hexamethyldisilazane	SCH.
Hexapropyltrimethoxysilane	UCC.
$\alpha$ -Methacryloxypropyltrimethoxysilane	UCC.
Methyltrimethoxysilane and polymethyltrisiloxane	DCC, UCC.
Polyoxyalkene silicones	DCC, UCC.
*Silicone fluids	DCC, SCH, SPD, SMS, UCC.
Trichloromethylsilane	DCC.
Trichloropropylsilane	DCC.
Trichlorovinylsilane	DCC.
Tris(2-methoxyethoxy)vinyl silane	UCC.
Vinyltriethoxysilane	UCC.
Organo-silicone compounds, all other	ALD, CMI, EKT, PIC, SPD, UCC.
*ORGANO-TIN COMPOUNDS:	
Bis(tributyltin)oxide	X.
Dibutyltin bis(isooctylmercaptoacetate)	CCM, FER, GCM, X.
Dibutyltin bis(mercaptolaurate)	X.
Dibutyltin dichloride	GCM, X.
Dibutyltin oxide	X.
Dibutyltin oxoide	X.
Ester tin mercaptoesters	X.
Monobutyltin oxide	GCM.
Monobutyltin thioanhydride	GCM.
Monobutyltin tris(isooctylmercaptoacetate)	GCM.
Octyltin	X.
Titanium acetylacetonate complex	KF.
Tributyltin chloride	GCM, X.
Tributyltin fluoride	X.
Tributyltin propylene glycol maleate	CCA.



TABLE 2.--MISCELLANEOUS CHEMICALS FOR WHICH U.S. PRODUCTION AND/OR SALES WERE REPORTED, IDENTIFIED BY MANUFACTURER, 1981--CONTINUED

MISCELLANEOUS CHEMICALS	MANUFACTURERS' IDENTIFICATION CODES (ACCORDING TO LIST IN TABLE 3)
-----	-----
MISCELLANEOUS CHEMICALS	
-----	-----
ACYCLIC--CONTINUED	
-----	-----
*OTHER MISCELLANEOUS ACYCLIC CHEMICALS--CONTINUED	
*ORGANO-TIN COMPOUNDS--CONTINUED	
Organo-tin compounds, all other-----	CCA, CCA, CCM, COS, MHI, WTC, X, X.
ORGANO-ZINC COMPOUNDS:	
Diethylzinc-----	ISA.
Perchloromethanethiol (Perchloromethyl mercaptan)	SFC.
Perfluoroalkyl polyether-----	X.
*Phosgene (Carbonyl chloride)-----	ACS, DUP, MOB, OMC, PPG, RUC, UCC, UPJ, VDM.
*Pine oil, synthetic-----	ARZ, NCI, SCM.
Potassium 2-methyl-2-butanol-----	X.
Potassium 2-methyl-2-propanol-----	X.
Sodium formaldehyde bisulfite-----	DAN, EK.
Sodium formaldehyde sulfoxylate-----	DA.
*Sodium methoxide (Sodium methylate)-----	DA, HSH, OMC, RBC.
Succinyl peroxide-----	MTL.
Miscellaneous acyclic chemicals, all other-----	AAC, ALD, ABA, ARZ, BKL, CAD, CCL, COS, EK, EKT, GCM, GLY, HCF, HMY, NCI, PEL, PIC, RBC, RPC, TNA, USR, MIL, X, X.
-----	-----
MIXTURES NOT SPECIFICALLY IDENTIFIED:	
Polymethacrylic acid esters-----	DUP.
Mixtures of miscellaneous acyclic chemicals not specifically identified-----	ABB, ACS, ALX, CCU, CEL, CMP, CRN, DEC, EXX, IGT, MAL, MIL, MON, NCI, OMC, PFZ, PG, PLC, PHP, RPC, SHP, SYP, TX, UCC, VND, MCC, MPO.

TABLE 3.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: DIRECTORY OF MANUFACTURERS, 1981

## ALPHABETICAL DIRECTORY BY CODE

[Names of manufacturers that reported production and/or sales of miscellaneous cyclic and acyclic chemicals to the U.S. International Trade Commission for 1981 are listed below in the order of their identification codes as used in table 2]

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
AAC	: Alcolac, Inc.	CHP	: C. H. Patrick & Co., Inc.
ABB	: Abbott Laboratories	CHT	: Chattem, Inc.
ACS	: Allied Corp., Allied Chemicals Co.	CIN	: Stockhausen, Inc.
ACY	: American Cyanamid Co.	CLC	: Gallery Chemical Co. Div. of Mine Safety
ADC	: Anderson Development Co.		: Appliances Co.
AFP	: Allied Corp., Fibers & Plastics Co. Div.	CLK	: Clark Oil & Refining Corp.
AGC	: Alberta Gas Chemicals, Inc.	CLN	: Clinton Corn Processing Co. Sub. of Nabisco
AIP	: Air Products & Chemicals, Inc.		: Products Co.
ALB	: Ames Laboratories, Inc.	CMP	: Commercial Products Co., Inc.
ALD	: Aldrich Chemical Co., Inc.	CNI	: Frye Copsystems, Inc., Conap Div.
ALI	: Associated Lead, Inc.	CNP	: Nipro Inc.
ALM	: Allemania Chemical Co.	CO	: Conoco, Inc.
ALX	: Alox Corp.	COC	: Columbia Organic Chemicals Co., Inc.
AMB	: American Bio-Synthetic Corp.	COS	: Cosan Chemical Corp.
AMD	: Cyclo Chemicals Corp.	CPS	: CPS Chemical Co.
AMO	: Standard Oil Co. (Indiana)	CRN	: CPC International, Inc., Amerchol Corp.
ARA	: Arapahoe Chemicals, Inc., Sub/Syntex U.S.A.,	CRZ	: Crown Zellerbach Corp.
	: Inc.	CWN	: Upjohn Co., Pine Chemical Div.
ARC	: Armak Co., Industrial Chemical Div.	CXI	: Chemical Exchange Industries, Inc.
ARS	: Arsynco, Inc.	CYL	: Cyclo Chemicals Corp.
ARZ	: Arizona Chemical Co.	CYR	: CYRO Industries, Inc.
ASH	: Ashland Oil, Inc.		
ASL	: The Ansul Co.	DA	: Diamond Shamrock Corp.
ATL	: Atlantic Chemical Corp.	DAN	: Dan River, Inc., Chemical Products Div.
ATR	: Atlantic Richfield Co., Arco Chemical Co.	DBC	: Badische Co.
AZT	: Dart & Kraft, Inc., Aztec Chemicals Div.	DCC	: Dow Corning Corp.
		DFW	: Deepwater Chemical Co., Ltd.
BAK	: Baker International - Magna Corp.	DLX	: Dixie Chemical Co., Inc.
BAS	: BASF Wyandotte Corp.	DKA	: Denka Chemical Corp.
BCC	: Buffalo Color Corp.	DOM	: Dominion Products
BFG	: B. F. Goodrich Co., B. F. Goodrich Chemical	DOW	: Dow Chemical Co.
	: Group	DRC	: Dock Resina Corp.
BKC	: J. T. Baker Chemical Co.	DUP	: E. I. duPont de Nemours & Co., Inc.
BKL	: Millmaster Onyx Group, Millmaster Chemical Co.	DVC	: Dover Chemical Corp. Sub. of ICC Industries,
	: Div.		: Inc.
BKM	: Buckman Laboratories, Inc.		
BLM	: Balchem Corp.	EFH	: E. F. Houghton & Co.
BOC	: Biocrafts, Inc.	EHC	: Ethichem Corp.
BOR	: Borden Co., Borden Chemical Div.	EK	: Eastman Kodak Co.:
BRD	: Lonza, Inc.	EKT	: Tennessee Eastman Co. Div.
BUC	: Synalloy Corp., Blackman-Uhler Chemicals Div.	EKS	: Texas Eastman Co. Div.
BUK	: Buckeye Cellulose Corp.	EMR	: Emery Industries, Inc.
		ENJ	: Exxon Chemical Americas
CAD	: Noury Chemical Corp.	ESX	: Essex Industrial Chemicals, Inc., Essex
CAU	: Calcasieu Chemical Corp.		: Chemical Corp.
CBD	: Chembond Corp.	EVN	: W.R. Grace & Co., Organic Chemicals Div.,
CBY	: Crosby Chemicals, Inc.		: Evans Chemetics
CCA	: Interstab Chemicals, Inc.		
CCC	: C.N.C. Chemical Corp.	FER	: Ferro Corp.:
CCL	: Catawba-Charlab, Inc.		: Ferro Chemical Div.
CCW	: Carstab Corp.		: Grant Chemical Div.
CEL	: Celanese Corp.:		: Kell Chemical Div.
	: Celanese Chemical Co., Inc.	FKE	: Frank Enterprises, Inc.
	: Celanese Fibers Co.		: FMC Corp.:
	: Celanese Plastics & Specialties Co.	FMB	: Industrial Chemical Group
CGY	: Ciba-Geigy Corp.	FMB	: Specialty Chemicals Group
CHG	: Mobay Chemical Corp., Agricultural Chemicals	FMP	: Industrial Chemical Group
	: Div.	FMT	: Fairmount Chemical Co., Inc.
CHL	: Chemol, Inc.	FOC	: Handschy Industries, Inc., Parac Oil &
			: Chemical Div.

TABLE 3.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: DIRECTORY OF MANUFACTURERS, 1981--CONTINUED

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
FRE	Freeman Chemical Corp.	NCC	Niacet Corp.
FRO	Vulcan Materials Co., Chemicals Div.	NCI	Union Camp Corp., Terpenes & Aromatics Div.
FTE	Footo Mineral Co.	NES	Ruetgers-Nease Chemical Co.
FTX	Finetex, Inc.	NEV	Neville Chemical Co.
GAF	GAF Corp.	NOC	Norac Co., Inc. and Mathe Div.
GAN	Gane's Chemicals, Inc.	NTB	National Biochemical Co.
GCM	Cardinal Chemical Co.	NTL	NL Industries, Inc.
GE	General Electric Co.	NWP	Northern Petrochemicals Co.
GIV	Givaudan Corp.	OH	Airco, Inc., Ohio Medical Products Div.
GLY	Glyco, Inc.	OMC	Olin Corp.
GP	Georgia-Pacific Corp.: Flaquemine Div. Resins Operations	ORA	M & T Chemicals, Inc.
GRD	W. R. Grace & Co., Polymers & Chemical Div.	ORO	Chervon Chemical Co.
GTL	Great Lakes Chemical Corp.	ORT	Roehr Chemicals, Inc.
GYR	Goodyear Tire & Rubber Co.	PAC	Pacific Anchor Chemical Corp.
HAL	C.P. Hall Co.	PAS	Pennwalt Corp.
HCF	Hercofina	PD	Warner-Lambert Co.
HCP	Honig Chemical & Processing Corp.	PEL	Pelron Corp.
HDC	Hodag Chemical Corp.	PEN	CPC International, Inc., Penick Corp.
HEX	Hexagon Laboratories, Inc.	PFN	Pfanstiehl Laboratories, Inc.
HFT	Syntex Agribusness, Inc. Hooker Chemical Corp.: Hooker Chemicals & Plastics Corp.: Industrial Chemicals Group	PFZ	Pfizer, Inc. & Pfizer Pharmaceuticals, Inc.
HK	Durez Div.	PG	Procter & Gamble Co., Procter & Gamble Manufacturing Co.
HLD	Onyx Chemical Co.	PIC	Pierce Chemical, Inc.
HML	Hummel Chemical Co.	PLC	Phillips Petroleum Co.
HMP	W. R. Grace & Co., Organic Chemicals Div.	PLS	Plastics Engineering Co.
HMY	Humphrey Chemical Co.	PMP	Premier Malt Products, Inc.
HN	Tenneco Chemicals, Inc.	PPG	PPG Industries, Inc.
HPC	Hercules, Inc.	PST	Perstorp, Inc.
HRT	Hart Products Corp.	PUB	Publicker Industries, Inc.
HSB	Harshaw Chemical Co.	QKO	Quaker Oaks Co.
HXL	Hexcel Corp., Hexcel Chemical Products	RBC	Fike Chemicals, Inc.
ICI	ICI Americas, Inc. & Chemical Specialties Group	RCI	Reichhold Chemicals, Inc.
IMC	International Minerals & Chemicals Corp., IMC Chemical Group	RCN	Racon, Inc.
IOC	Sybron Chemical Div. of Sybron Corp.	RDA	Rhone-Poulenc, Inc.
KAI	Kaiser Aluminum & Chemical Corp., Kaiser Chemical Div.	REG	Regis Chemical Co.
KCH	Joseph Ayers, Inc.	REH	Reheis Chemical Co. Div. of Armour Pharmaceutical Co.
KF	Kay-Fries Inc., Member Dynamit Nobel Group	REM	Remington Arms Co., Inc.
KLM	Kalama Chemical, Inc.	RH	Rohm & Haas Co.
KPT	Koppers Co., Inc.	RPC	Millmaster Onyx Group, Kewanee Industries Inc.
LCP	LCP Chemicals - West Virginia, Inc.	RSA	R.S.A. Corp.
LEM	Napp Chemicals, Inc.	RUC	Rubicon Chemicals, Inc.
LTL	Eli Lilly & Co.	S	Sandoz, Inc., Colors & Chemicals Div.
MAL	Mallinckrodt, Inc.	SAR	Leski, Inc.
MCB	Borg-Warner Corp., Borg-Warner Chemicals	SBC	Scher Chemicals, Inc.
MCI	Mooney Chemicals, Inc.	SCM	SCM Corp.: Organic Chemicals Div. PCR, Inc.
MHI	Thiokol Corp., Ventron Div.	SCP	Henkel Corp.
MIL	Milliken & Co., Milliken Chemical Co.	SDC	Martin-Marietta Corp., Sodeyco Div. Sterling Drug, Inc.:
MLS	Miles Laboratories, Inc. Biotechnology Group	SDH	Hilton Davis Chemical Co. Div.
MMC	EM Industries, Inc., EM Science Div.	SDW	Sterling Organics Div.
MNO	Monochem, Inc.	SFA	Stauffer Chemical Co.:
MNB	Mobay Chemical Corp., Pittsburgh Div.	SFC	Agricultural Div.
MON	Monsanto Co.	SFI	Calho Chemicals, Inc.
MRK	Merck & Co., Inc.	SFP	Industrial Div.
MTO	Montrose Chemical Corp. of California	SFS	Plastics Div.
		SHC	Specialty Chemical Div. Shell Oil Co., Shell Chemical Co. Div.

TABLE 3.--MISCELLANEOUS CYCLIC AND ACYCLIC CHEMICALS: DIRECTORY OF MANUFACTURERS, 1981--CONTINUED

CODE	NAME OF COMPANY	CODE	NAME OF COMPANY
SHP	Shepherd Chemical Co.	UCC	Union Carbide Corp.
SHX	Sherex Chemical Co., Inc.	UPJ	Upjohn Co.
SK	SmithKline Beckman Corp., SmithKline Chemicals Div.	USB	U.S. Borax & Chemical Corp.
SKO	Getty Refining & Marketing Co.	USI	National Distillers & Chemicals Corp., U.S. Industrial Chemicals Co.
SM	Mobil Oil Corp., Mobil Chemical Co.: Chemical Coatings Div. Phosphorus Div.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SNO	SunOlin Chemical Co.	USS	USS Chemicals Div. of U.S. Steel Corp.
SNW	Sun Chemical Corp., Chemicals Div.	VAL	Valchem Div. of United Merchants & Manufactures, Inc.
SOC	Standard Oil Co. of California, Chevron Chemical Co.	VDM	Van De Mark Chemical Co., Inc.
SOH	Vistron Corp.	VEL	Velsicol Chemical Corp.
SOI	Specialty Organics, Inc.	VGC	Virginia Chemicals, Inc.
SOL	Southland Corp., Fine Chemical Div.	VIK	Viking Chemical Co.
SPD	General Electric Co., Silicone Products Dept.	VND	Van Dyk & Co., Inc.
STC	American Hoechst Corp., Sou-Tex Works	WAG	West Agro-Chemical, Inc.
SW	Sherwin-Williams Co.	WAY	Phillip A. Hunt Chemical Corp., Organic Chemical Div.
SWS	Stauffer Chemical Co., SWS Silicones Div.	WCC	White Chemical Corp.
SYL	SylvaChem Corp.	WCL	Wright Chemical Corp.
SYP	Dart & Kraft, Inc., Synthetic Products Co. Div.	WLN	Wilmington Chemical Corp.
TCC	Sybron Corp., Chemical Division/Tanatex	WM	American Can Co., Inolex Chemicals Div.
TCH	Emery Industries Inc., Tylon Div.	WPG	West Point-Pepperell, Inc., Griffitex Chemical Co. Sub.
TKL	Thickol Corp., Specialty Chemicals Div.	WTC	Witco Chemical Corp.
TLC	Twin Lake Chemical, Inc.	WTH	Union Camp Corp.
TNA	Ethyl Corp.	WTL	Pennwalt Corp., Lucidol Div.
TNI	The Gillette Co., Chemical Div.	WVA	Westvaco Corp., Polychemicals Dept.
TRN	Trinity Chemical Corp.	WYC	Wycon Chemical Co.
TRO	Troy Chemical Corp.	WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.
TSA	Texas Alkyls, Inc.	ZGL	Carolina Processing Corp.
TUL	Tull Chemical Co., Inc.		
TX	Texaco, Inc.		
TZC	Magnesium Elektron, Inc.		

Note.—Complete names, telephone number, and addresses of the above reporting companies are listed in table 1 of the appendix. The above codes identify those of the 282 reporting companies and company divisions for which permission to publish was not restricted.



A P P E N D I X





TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF  
MANUFACTURERS, BY COMPANY, 1981

[Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1981 are listed below alphabetically, together with their identification codes as used in table 2 of the 15 individual sections of this report]

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
AEP	: A & E Plastik Pak Co., Inc., A & E	: 213-968-3801	: 14505 Proctor Ave., Industry, CA 91749.
	: Plastics, Inc.		
AZS	: AZS Corp.:		
	: AZ Products Co. Div-----	: 813-665-6226	: 2525 So. Combee Rd., Lakeland, FL 33801.
	: AZS Chemical Co. Div-----	: 404-873-1851	: 762 Marietta Blvd., Atlanta, GA 30318.
ABB	: Abbott Laboratories-----	: 312-937-7262	: 14th St. and Sheridan Rd., N. Chicago, IL 60064.
ABS	: Abex Corp., Friction Products Group--	: 212-560-3200	: P. O. Box 3250, Winchester, VA 22601.
ADO	: Adco Chemical Co-----	: 201-589-0880	: Rutherford and Delaney Sts. Newark, NJ 07105.
WLC	: Agrico Chemical Co-----	: 918-588-2000	: P. O. Box 3166, Tulsa, OK 74101.
AGY	: Agway, Inc., Olean Nitrogen Complex--	: 315-477-6566	: 1466 Buffalo St., Olean, NY 14760.
OH	: Airco, Inc., Ohio Medical Products	: 201-573-0800	: 3030 Airco Dr., Madison, WI 53701.
	: Div.		
AIP	: Air Products & Chemicals, Inc-----	: 215-481-4911	: P. O. Box 538, Allentown, PA 18105.
AIC	: Albany International Corp-----	: 614-876-3637	: 1979 Atlas St., Columbus, OH 43228.
AGC	: Alberta Gas Chemicals, Inc-----	: 201-267-1400	: 7 Century Dr., Parsippany, NJ 07054.
ALC	: Alco Chemical Corp-----	: 615-629-1405	: 909 Mueller Dr., Chattanooga, TN 37406.
AAC	: Alcolac, Inc-----	: 301-355-2600	: 3440 Fairfield Rd., Baltimore, MD 21226.
ALD	: Aldrich Chemical Co., Inc-----	: 414-273-3850	: 940 W. St. Paul Ave., Milwaukee, WI 53233.
ALE	: Alex Chemical Co-----	: 717-462-3500	: 119 N. Union St., Shenandoah, PA 17976.
ALG	: Allegheny Chemical Corp-----	: 814-776-1186	: Gillis Ave., Ridgway, PA 15853.
ALM	: Allemania Chemical Co-----	: 504-687-6311	: P. O. Box 716, Plaquemine, LA 70764.
ALL	: Alliance Chemical, Inc-----	: 201-945-5400	: 33 Avenue P., Newark, NJ 07105.
ALS	: Allied Corp-----	: 201-455-2000	: P. O. Box 1079-R, Morristown, NJ 07960.
ACS	: Allied Chemicals Co-----	: 201-455-2351	: P. O. Box 2251-R, Morristown, NJ 07960.
AFP	: Allied Fibers & Plastics Co-----	: 212-391-5200	: 1411 Broadway, New York, NY 10018.
ACU	: Union Texas Petroleum Co-----	: 713-960-7500	: P. O. Box 2120, Houston, TX 77001.
APA	: Allied Products Corp., Acme	: 203-562-2171	: P. O. Box 1404, 166 Chapel St., New Haven, CT
	: Chemicals & Insulation Div.		: 06505.
ALX	: Alox Corp-----	: 716-282-1295	: 3943 Buffalo Ave., Niagara Falls, NY 14303.
APH	: Alpha Corp-----	: 901-853-2450	: P. O. Drawer A, Collierville, TN 38017.
ALP	: Alpha Laboratories, Inc-----	: 303-756-1338	: 1685 S. Fairfax St., Denver, CO 80222.
HES	: Amerada Hess Corp. (Hess Oil Virgin	: 201-636-3000	: 1 Hess Plaza, Woodbridge, NJ 07095.
	: Island Corp.).		
AMB	: American Bio-Synthetica Corp-----	: 414-384-7017	: 710 W. National Ave., P. O. Box # 04275,
			: Milwaukee, WI 53204.
	: American Can Co.:		
WM	: Inolex Chemicals Co-----	: 215-271-6400	: Jackson & Swanson Sts., Philadelphia, PA 19148.
MAR	: Lignin Chemicals Div-----	: 203-552-2000	: GOP #8, P. O. Box 3650, Greenwich, CT 06830.
AC	: American Color & Chemical Corp-----	: 704-364-3270	: 6525 Morrison Blvd., Charlotte, NC 28211.
ACY	: American Cyanamid Co-----	: 201-831-2000	: Wayne, NJ 07470.
HST	: American Hoechst Corp:		
	: Industrial Chemicals Div-----	: 401-823-2000	: 129 Quindick St., Coventry, RI 02816.
	: Petrochemicals Div-----	: 201-231-2299	: Route 202-206 North, Somerville, NJ 08876.
STC	: Sou-Tex Works-----	: 704-827-7531	: P. O. Box 886, Mount Holly, NC 28052
ASY	: American Synthetic Rubber Corp-----	: 502-448-2761	: P. O. Box 32960, Louisville, KY 40232.
ALB	: Ames Laboratories, Inc-----	: 203-874-2463	: 200 Rock Lane, Milford, CT 06460.
HVG	: Ametek, Inc., Havg Div-----	: 302-995-0410	: 900 Greenbank Rd., Wilmington, DE 19808.
AMV	: Amvac Chemical Corp-----	: 213-264-3910	: 4100 E. Washington Blvd., Los Angeles, CA 90023.
ADC	: Anderson Development Co-----	: 517-263-2121	: 1415 E. Michigan St., Adrian, MI 49221.
ASL	: Ansul Co-----	: 715-735-7411	: 1 Stanton St., Marinette, WI 54143.
APX	: Apex Chemical Co., Inc-----	: 201-354-5420	: 200 S. 1st St., Elizabethport, NJ 07206.
APO	: Apollo Colors, Inc-----	: 312-564-9190	: 899 Skokie Blvd., Northbrook, IL 60062.
ARA	: Arapahoe Chemicals, Inc., Sub/Syntex	: 303-442-7926	: 2075 N. 55th St., Boulder, CO 80302.
	: U.S.A., Inc.		
ARN	: Arenol Chemical Corp-----	: 212 784-0948	: 40-33 23d St., Long Island City, NY 11101.
ARZ	: Arizona Chemical Co-----	: 201-794-3200	: Berdan Ave., Wayne, NJ 07470.
AKS	: Arkansas Co., Inc-----	: 201-589-0516	: 185 Foundry St., Newark, NJ 07105.
ARC	: Armark Co., Industrial Chemical Div--	: 312-786-0400	: 300 S. Wacker Dr., Chicago, IL 60606.
AGP	: Armour-Dial, Inc-----	: 312-892-4381	: 2000 Aucutt Rd., Montgomery, IL 60545.
ARP	: Armour Pharmaceutical Co-----	: 815-932-6771	: P. O. Box 511, Kankakee, IL 60901.
ARK	: Armstrong World Industries, Inc-----	: 217-397-0611	: Charlotte & Liberty Sts., Lancaster, PA 17604.
ARO	: ARNCO-----	: 213-567-1378	: 5141 Firestone Place, South Gate, CA 90280.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
ARL	: Arol Chemical Products Co-----	: 201-344-1510	: 649 Ferry St., Newark, NJ 07105.
ARS	: Arsynco, Inc-----	: 212-898-2300	: 126-02 Northern Blvd., Flushing, NY 11368.
ASH	: Ashland Oil Inc-----	: 606-329-3333	: P. O. Box 391, Ashland, OH 41101, and P. O. Box 2219, Columbus, OH 43216.
ALI	: Associated Lead, Inc-----	: 215-427-4600	: 2545 Aramingo Ave., Philadelphia, PA 19125.
BLA	: Astor Products, Inc., Blue Arrow Div.-----	: 904-783-5000	: 5244 Edgewood Ct., Jacksonville, FL 32205.
ATL	: Atlantic Chemical Corp-----	: 201-235-1800	: 10 Kingsland Rd., Nutley, NJ 07110.
ATR	: Atlantic Richfield Co., Arco Chemical Co.-----	: 213-486-3511	: 515 S. Flower St., Los Angeles, CA 90064.
APD	: Atlas Powder Co., Sub. of Tyler Corp.-----	: 417-624-0212	: P. O. Box 87, Joplin, MO 64801.
APR	: Atlas Processing Co-----	: 318-636-2711	: P. O. Box 3099, Shreveport, LA 71103.
ARI	: Atlas Refinery, Inc-----	: 201-589-2002	: 142 Lockwood St., Newark, NJ 07105.
AUX	: Auralux Corp-----	: 401-539-2306	: Main St., Hope Valley, RI 02832.
KCH	: Joseph Ayers, Inc-----	: 215-837-1808	: 275 Keystone Dr., Bethlehem, PA 18017.
BAS	: BASF Wyandotte Corp-----	: 201-263-3400	: 100 Cherry Hill Rd., Parsippany, NJ 07054.
PSN	: Pigments Div-----	: 616-392-2391	: 491 Columbia Ave., Holland, MI 49423.
FSN	: BFC Chemicals, Inc-----	: 302-575-7850	: 4311 Lancaster Pike, P. O. Box 2867, Wilmington, DE 19805
DBC	: Badische Corp-----	: 804-887-6000	: 602 Copper Rd., Freeport, TX 77541. 50 Central Ave., Kearny, NJ 07032.
BKC	: J. T. Baker Chemical Co-----	: 201-859-2151	: 222 Red School Lane, Phillipsburg, NJ 08865.
BAK	: Baker International - Magna Corp-----	: 713-795-4270	: P. O. Box 33387, Houston, TX 77033.
BLM	: Balchem Corp-----	: 914-355-2861	: P. O. Box 175, Slate Hill, NY 10973.
BLC	: Ball Chemical Co-----	: 412-486-1111	: 1486 Butler Plank Rd., Glenshaw, PA 15116.
BAX	: Baxter Travenol Laboratories, Inc-----	: 312-948-2000	: 6301 N. Lincoln Ave., Morton Grove, IL 60053.
BCK	: Beckman Microbics-----	: 714-438-9151	: 6200 El Camino Rd., Carlsbad, CA 92008.
BEE	: Beecham, Inc., Beecham Laboratories Div.-----	: 201-469-5200	: 101 Possumtown Rd., Piscataway, NJ 08854.
BCM	: Belding Corticelli Industries-----	: 212-944-6040	: 1430 Broadway, New York, NY 10018.
BLZ	: Belzak Corp-----	: 201-773-0602	: 850 Bloomfield Ave., Clifton, NJ 07012.
BME	: Bendix Corp., FM Div-----	: 518-273-6550	: P. O. Box 238, Troy, NY 12180.
BEN	: Bennett's-----	: 801-486-2211	: P. O. Box 1320, Salt Lake City, UT 84110.
PDC	: Berncolours-Poughkeepsie, Inc-----	: 914-454-6700	: 75 N. Water St., Poughkeepsie, NY 12601.
BTS	: Bethlehem Steel Corp-----	: 215-694-4522	: Martin Tower, Bethlehem, PA 18016.
BDS	: Biddle Sawyer Corp-----	: 212-736-1580	: 2 Penn Plaza - Suite 2355, New York, NY 10121.
BNS	: Binney and Smith, Inc-----	: 215-253-6271	: P. O. Box 431, 1100 Church Lane, Easton, PA 18042.
BNC	: Biocraft Laboratories, Inc-----	: 201-796-3434	: 12 Industrial Way, Waldwick, NJ 07463.
BNP	: Bison Nitrogen Products Co-----	: 712-277-1340	: P. O. Box 1828, Sioux City, IA 51102.
LAK	: Bofora Nobel, Inc. and Lakeway, Inc-----	: 616-788-2341	: 5025 Evanston Ave., Muskegon, MI 49443.
BHA	: Boots Hercules Agrochemicals Co-----	: 302-575-7850	: 4311 Lancaster Pike, P. O. Box 2867, Wilmington, DE 19805.
BOR	: Borden, Inc.: : Borden Chemical Div----- : Printing Ink Div., Pigments Div-----	: 614-225-4000 : 513-782-6200	: 180 E. Broad St., Columbus, OH 43215. 630 Glendale-Milford Rd., Cincinnati, OH 45215.
MCB	: Borg Warner Corp., Borg Warner Chemicals.-----	: 304-424-5664	: International Center, Parkersburg, WV 26101.
BPP	: Breddo Food Products Corp., Inc-----	: 913-321-5300	: 18th and Kansas Avenue, Kansas City, KS 66105.
BRS	: Bristol-Meyers Co-----	: 212-546-4000	: 345 Park Ave., New York, NY 10022.
BRU	: M. A. Bruder & Sons, Inc-----	: 215-353-5100	: 52d St. and Grays Ave., Philadelphia, PA 19143.
BUK	: Buckeye Cellulose Corp-----	: 901-454-8100	: 2899 Jackson Ave., Memphis, TN 38108.
BKM	: Buckman Laboratories, Inc-----	: 901-278-0330	: 1256 N. McLean Blvd., Memphis, TN 38108.
BCC	: Buffalo Color Corp-----	: 716-827-4500	: 340 Elk St., Buffalo, NY 14210.
BJL	: Burdick & Jackson Laboratories, Inc-----	: 616-726-3171	: 1953 S. Harvey St., Muskegon, MI 49442.
BUR	: Burroughs Wellcome Co-----	: 919-541-9090	: 3030 Cornwallis Rd., Research Triangle Park, NC 27709.
CLF	: CF & I Steel Corp., Pueblo Plant-----	: 303-561-6100	: P. O. Box 316, Pueblo, CO 81002.
CPI	: CF Industries, Inc-----	: 312-438-4500	: Salem Lake Dr., Long Grove, IL 60047.
CCC	: C.N.C. Chemical Corp-----	: 401-751-7711	: P. O. Box 997, Annex Station, Providence, RI 02901.
ACR	: CFC International, Inc.: : Acme Resin Corp-----	: 312-771-9680	: 1401 S. Circle Avenue, Forest Park, IL 60130.
CRN	: Amerchol Corp-----	: 201-894-4000	: International Plaza, Englewood Cliffs, NJ 07632.
PEN	: Penick Corp-----	: 201-935-6600	: 1050 Wall St. W., Lyndhurst, NJ 07071.
CPS	: CPS Chemical Co., Inc-----	: 201-727-3100	: P. O. Box 162, Old Bridge, NJ 08857.
CYR	: CYRO Industries-----	: 201-365-6700	: 697 Route 46, Clifton, NJ 07015.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
CAU	Calcasieu Chemical Corp.	918-561-2700	P. O. Box 1522, Lake Charles, LA 70602.
CRC	California Resin and Chemical Co., Inc.	707-552-3500	501 Green Island Rd., Vallejo, CA 94590.
CLC	Callery Chemical Co. Div. of Mine Safety Appliances Co.	412-273-5000	Callery, PA 16024.
CRB	Caribe Isoprene Corp.	809-843-8686	Firm Delivery, Ponce, PR 00731.
CGM	Cardinal Chemical Co.	803-799-7190	P. O. Box 345, Columbia, SC 29202.
CGL	Cargill, Inc.	612-475-7637	P. O. Box 9300 CPD/30, Minneapolis, MN 55440.
GOR	Carl Gordon Industries, Inc.	617-798-8721	1001 Southbridge St., Worcester, MA 01610.
ZGL	Carolina Processing Corp.	203-329-7100	P. O. Box 195, Severn, NC 27877.
CHC	Carpenter Chemical Co.	804-233-8391	P. O. Box 27205, Richmond, VA 23261.
CCW	Carstab Corp.	513-733-2100	West St., Reading, OH 45215.
BSC	Cascade Resins, Inc.	503-343-2111	P.O. Box 1989, Eugene, OR 97440.
DOL	Castle & Cooke, Inc., Castle & Cooke Foods, Hawaii Pineapple Div.	808-536-3411	650 Iwilei Rd., Honolulu, HI 96801.
CCL	Catawba-Charlab, Inc.	704-523-4242	5046 Old Pineville Rd., Charlotte, NC 28224.
CEL	Celanese Corp.:		
	Celanese Chemical Co., Inc.	214-689-4890	1250 W. Mockingbird Lane, Dallas, TX 75247.
	Celanese Fibers Co.	704-554-2000	P. O. Box 1414, Charlotte, NC 28201.
	Celanese Plastics & Specialties Co.	502-585-8011	12 Main St., Chatham, NJ 07928, and One Riverfront Plaza, Louisville, KY 40202.
CNT	Certaineed Corp.	215-687-5000	P. O. Box 860, Valley Forge, PA 19482.
CPR	Certified Processing Corp.	201-923-5200	U.S. Highway #22, Hillside, NJ 07205.
GRS	Champlin Petroleum Co.	512-882-8871	P. O. Box 9176, Corpus Christi, TX 78408.
SOG	Charter International Oil Co.	904-358-4579	P. O. Box 5008, Houston, TX 77012.
CHT	Chattrea, Inc.	615-821-4571	1715 W. 38th St., Chattanooga, TN 37409.
CBD	Chembond Corp.	503-746-6501	P. O. Box 270, Springfield, OR 97477.
GRL	Chemed Corp, Vestal Laboratories Div.	314-535-1810	5035 Manchester Ave., St. Louis, MO 63110.
CI	Chem-Fleur, Inc.	201-589-4266	200 Pulaski St., Newark, NJ 07105.
CX1	Chemical Exchange Industries, Inc.	713-526-8291	P. O. Box 812, Houston, TX 77001.
CMT	Chemithon Corp.	206-937-9954	5430 W. Marginal Way, S.W., Seattle, WA 98106.
CHL	Chemol, Inc.	919-272-3121	P. O. Box 20687, Greensboro, NC 27420.
CPX	Chemplex Co.	312-437-7800	3100 Golf Rd., Rolling Meadows, IL 60008.
ORO	Chevron Chemical Co.	415-894-7700	575 Market St., Rm. 3280, San Francisco, CA 94105.
CHH	CHR. Hansen's Laboratory, Inc.	414-476-3630	9015 W. Maple St., West Allis, WI 53214.
CGY	Ciba-Geigy Corp.	914-478-3131	444 Saw Mill River Rd., Ardsley, NY 10502.
	Agricultural Div.	919-292-7100	P. O. Box 18300, 410 Swing Rd., Greensboro, NC 27419.
	Resin Dept.	914-478-3131	444 Saw Mill River Rd., Ardsley, NY 10502.
	Cities Service Co.:		
CBN	Columbian Chemicals Co.	918-744-1770	P. O. Box 37, Tulsa, OK 74102.
TEN	Copperhill Operations	615-496-3331	Copperhill, TN 37317.
CRN	Petrochemicals Div.	918-561-2700	P. O. Box 1522, Lake Charles, LA 70602, and 250 North Belt East, Houston, TX 77060.
		918-561-2211	P. O. Box 1562, Lake Charles, LA 70602.
C50	Petroleum Products Group	318-491-6011	P. O. Box 1562, Lake Charles, LA 70602.
CLK	Clark Chemical Corp. Sub. of Clark Oil & Refining Corp.	312-385-5000	131st St. & Kedzie Ave., Blue Island, IL 60406.
CLY	W. A. Clearly Corp.	201-247-8000	P. O. Box 10, Somerset, NJ 08873.
CLN	Clinton Corn Processing Co. Sub. of Nabisco Products Co.	212-759-4400	1251 Beaver Channel Pkwy., Clinton, IA 52732.
CLI	Clintwood Chemical Co.	312-927-1071	4341 S. Wolcott Ave., Chicago, IL 60609.
CSP	Coastal Corp., Coastal States Petroleum Co.	512-887-4100	P. O. Drawer 521, Corpus Christi, TX 78403.
CP	Colgate-Palmolive Co.	212-310-2000	300 Park Ave., New York, NY 10022.
CLD	Colloids, Inc.	201-926-6100	394 Frelinghuysen Ave., Newark, NJ 07114.
CCS	Colorado Chemical Specialties, Inc.	303-278-1963	4295 McIntyre St., Golden, CO 80401.
CLO	Colorado Organic Chemical Co., Inc.	303-571-1895	5321 Dahlia St., Commerce City, MO 80022.
CNC	Columbia Nitrogen Corp.	404-823-4000	P. O. Box 1483, Augusta, GA 30913.
COC	Columbia Organic Chemicals Co., Inc.	803-776-4990	P. O. Box 9096, Columbia, SC 29290.
CAC	Cominco American, Inc., Camex Operations	509-747-6111	P. O. Box 5067, Borger, TX 79007.
CMP	Commercial Products Co., Inc.	201-427-6887	117 Ethel Ave., Hawthorne, NJ 07506.
COR	Commonwealth Oil Refining Co., Inc.	809-843-3030	Petrochemical Complex, Ponce, PR 00731.
CPI	Commonwealth Petrochemical, Inc.	809-843-3030	Petrochemical Complex, Ponce, PR 00731.
CON	Concord Chemical Co., Inc.	609-966-1526	17th & Federal Sts., Camden, NJ 08105.
CO	Conoco, Inc.	405-767-3456	P. O. Box 1267, 100 S. Pine, Ponca City, OK 74603.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
CWP	: Consolidated Papers, Inc-----	: 715-422-3111	: 231 1st Ave. N., Wisconsin Rapids, WI 54494.
CTL	: Continental Chemical Co-----	: 201-472-5000	: 270 Clifton Blvd., Clifton, NJ 07015.
CTP	: Continental Polymers, Inc-----	: 213-637-2103	: 225 E. Del Amo Blvd., Compton, CA 90220.
CPV	: Cook Paint & Varnish Co-----	: 816-391-6100	: 919 E. 14th Ave., N. Kansas City, MO 64116.
CFA	: Cooperative Farm Chemicals Association.	: 913-843-7300	: P. O. Box 308, Lawrence, KS 06044.
COP	: Coopers Creek Chemical Corp-----	: 215-828-0375	: River Rd., W. Conshohocken, PA 19428.
CFY	: Copolymer Rubber & Chemical Corp-----	: 504-355-5655	: P. O. Box 2591, Baton Rouge, LA 70821.
SWC	: Corco Cyclohexane, Inc-----	: 809-843-3030	: Petrochemical Complex, Ponce, PR 00731.
CLU	: Core-Lube, Inc-----	: 217-662-2136	: P. O. Box 811, Danville, IL 61832.
CRP	: Corpus Christi Petrochemicals Co-----	: 713-751-7100	: 707 McKinney St., SW Tower, Suite 1400, Houston, TX 77002.
COS	: Cosan Chemical Corp-----	: 201-400-9300	: 400 - 14th St., Carlstadt, NJ 07072.
CSD	: Cosden Oil & Chemical Co-----	: 214-750-2400	: 8350 N. Central, Dallas, TX 75206.
CRT	: Crest Chemical Corp-----	: 201-623-3334	: 225 Emmet St., Newark, NJ 07114.
CRD	: Croda, Inc-----	: 212-683-3089	: 51 Madison Ave., New York, NY 10010.
CK	: Crompton & Knowles Corp., Dyes & Chemical Div	: 215-376-6731	: 500 Pear St., Reading, PA 19603.
CBY	: Crosby Chemicals, Inc-----	: 601-798-6902	: P. O. Box 460, Picaayune, MS 39466.
CCP	: Crown Central Petroleum Corp-----	: 301-539-7400	: 1 N. Charles St., Baltimore, MD 21203.
USM	: Crown Metro, Inc-----	: 803-277-1870	: P. O. Box 5696, Greenville, SC 29606.
CRZ	: Crown Zellerbach Corp-----	: 415-951-5000	: P. O. Box 4266, Vancouver, WA 98662.
CYT	: Crystal Chemical Co-----	: 713-682-1221	: 1523 N. Post Oak Rd., Houston, TX 77055.
CUS	: Custom Pigments Corp-----	: 312-252-7273	: 2125 W. Rtee St., Chicago, IL 60622.
CTR	: Custom Resins Div. of Bemis Co., Inc	: 502-826-7641	: P. O. Box 933, Henderson, KY 42420.
AMD	: Cyclo Chemical Corp-----	: 213-582-6411	: 1922 E. 64th St., Los Angeles, CA 90001, and
CYL	: 305-592-6700	: 7500 N.W. 66th St., Miami, FL 33166.	
DAT	: Daitom, Inc-----	: 913-371-1452	: 5200 Speaker Rd., Kansas City, KS 66101.
DAN	: Dan River, Inc., Chemical Products Div.	: 803-298-9000	: P. O. Box 261, Danville, VA 24540.
	: Dart & Kraft, Inc.:		
AZT	: Aztec Chemicals Div-----	: 312-498-8000	: P. O. Box 250, Elyria, OH 44035.
SYP	: Synthetic Products Co. Div-----	: 216-531-6010	: 1636 Wayside Rd., Cleveland, OH 44112.
DYS	: Davies-Young Co-----	: 314-291-1900	: 2700 Wagner Place, Maryland Heights, MO 63043.
DGO	: Day-Glo Color Corp-----	: 216-391-7070	: 4515 St. Clair Ave., Cleveland, OH 44103.
DFW	: Deepwater Chemical Co., Ltd-----	: 714-751-3522	: P. O. Box 17599, Irvine, CA 92713.
DEG	: Degeen Oil & Chemical Co., Inc-----	: 201-432-1192	: 200 Kellogg St., Jersey City, NJ 07305.
DGC	: Degussa Corp-----	: 205-653-7933	: Theodore Industrial Park, P. O. Box 606, Theodore, AL 36582.
DKA	: Denka Chemical Corp-----	: 713-477-8821	: 8701 Park Place Blvd., Houston, TX 77017.
DNS	: Dennis Chemical Co-----	: 314-771-1800	: 2701 Papin St., St. Louis, MO 63103.
DRB	: The Derby Co., Inc-----	: 617-881-3160	: P. O. Box 146, Megunco Rd., Ashland, MA 01721.
DSO	: DeSoto, Inc-----	: 312-391-9000	: 1700 S. Mt. Prospect Ave., Des Plaines, IL 60018.
DEX	: Dexter Chemical Corp-----	: 212-542-7700	: 845 Edgewater Rd., Bronx, NY 10474.
HYC	: Hysol Div-----	: 213-968-6511	: 15051 E. Don Julian Rd., Industry, CA 91749
MID	: Midland Div-----	: 203-623-9801	: 1-7 E. Water St., Waukegan, IL 60085.
DA	: Diamond Shamrock Corp-----	: 214-745-2000	: 717 N. Harwood St., Dallas, TX 75201.
	: Diamond Shamrock Agricultural Chemicals, Inc.:		
	: Cresylic-----	: 205-556-3500	: P. O. Box H, Tuscaloosa, AL 35404.
	: Phenoxy Plant-----	: 205-556-3500	: P. O. Box H, Tuscaloosa, AL 35404.
FLN	: Disogrin Industries Corp-----	: 603-669-4050	: Grenier Industrial Airpark, Manchester, NH 03130.
DIX	: Dixie Chemical Co., Inc-----	: 713-526-2604	: 3635 W. Dallas Ave., Houston, TX 77019.
DPP	: Dixie Pine Chemicals, Inc-----	: 601-584-6221	: P. O. Box 470 Hattiesburg, MS 39401.
DRM	: Dock Resins Corp-----	: 201-862-2351	: 1512 W. Elizabeth Ave., Linden, NJ 07036.
DOM	: Dominion Products-----	: 212-489-3050	: 882 3d Ave., Brooklyn, NY 11232.
DHC	: Donner-Hanna Coke Joint Venture-----	: 716-822-1600	: P. O. Box A, S. Paul Station, Buffalo, NY 14220
DVC	: Dover Chemical Corp., Sub. of ICC Industries, Inc.	: 216-343-7711	: W. 15th & Davis Sts., P. O. Box 40, Dover, OH 44622.
DOW	: Dow Chemicals Co-----	: 517-636-1000	: 2020 Dow Center, Midland, MI 48650.
DCC	: Dow Corning Corp-----	: 517-496-4000	: P. O. Box 1767, Mail Code #C02216, Midland, MI 48640.
DUP	: E. I. duPont de Nemours & Co., Inc-----	: 302-774-2421	: DuPont Bldg., Wilmington, DE 19898.
BAL	: Dutch Boy Paints, Consumer Div., Sherwin-Williams Co.	: 312-441-6650	: 2325 Hollins Ferry Rd., Baltimore, MD 21230.
DSC	: Dye Specialties, Inc-----	: 201-866-9504	: 100 Plaza Center, Box 1532, Secaucus, NJ 07094.



TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
MMC	: EM Industries, Inc., EM Science Div	: 609-423-6300	: 2909 Highland Ave., Cincinnati, OH 45212.
EPI	: Eagle Picher Industries, Ohio	: 817-387-0585	: P. O. Box 1398, Denton, TX 76201.
	: Rubber Co. Div.		
ECC	: Eastern Color & Chemical Co	: 401-331-9000	: 35 Livingston St., Providence, RI 02904.
EK	: Eastman Kodak Co	: 716-724-4000	: 343 State St., Rochester, NY 14650.
EKT	: Tennessee Eastman Co. Div	: 615-246-2111	: P. O. Box 511, Kingsport, TN 37662.
EKX	: Texas Eastman Co. Div	: 214-757-6611	: P. O. Box 511, Kingsport, TN 37662.
ESA	: East Shore Chemical Co., Inc	: 616-726-3106	: 1221 E. Barney Ave., Muskegon, MI 49443.
EEP	: Eaton Corp., EPP Div	: 216-523-5000	: Main & Orchard, Mantua, OH 44255.
ELN	: Elan Chemical Co	: 201-344-8014	: 268 Doremus Ave., Newark, NJ 07105.
ELC	: Elco Corp., Sub. of Detrex Industries, Inc.	: 313-358-5800	: P. O. Box 09168, Cleveland, OH 44109.
ELP	: EL Paso Polyolefins Co	: 201-262-6500	: W. 115 Century Rd., Paramus, NJ 07652.
ELP	: El Paso Products Co	: 915-333-7200	: P. O. Box 3986, Odessa, TX 79760.
EMR	: Emery Industries, Inc	: 513-762-6200	: 1300 Carew Tower, Cincinnati, OH 45202.
TCH	: Trylon Div	: 803-963-4031	: P. O. Box 628, Mauldin, SC 29662.
USM	: Emhart Corp., Bostik Div	: 617-777-0100	: Boston St., Middleton, MA 01949.
EMK	: Emkay Chemical Co	: 201-352-7053	: 319 2d St., Elizabeth, NJ 07206.
ENX	: Endo Laboratories, Inc	: 516-832-2002	: 1000 Stewart Ave., Garden City, NY 11743.
ENO	: Enenco, Inc	: 201-573-2800	: P. O. Box 125, Memphis, TN 38101.
EPC	: Enterprise Products Co., Enterprise Petrochemicals Co., Sub.	: 713-880-6500	: P. O. Box 4324, Houston, TX 77210.
SWT	: Eschem, Inc., Swift Technical Products Div.	: 219-836-2468	: 419 Ridge Rd., Suite M, Munster, IN 46321.
ESS	: Essential Chemicals Group	: 414-691-3000	: 28391 Essential Rd., Merton, WI 53056.
ESX	: Essex Chemical Corp., Essex Industrial Chemicals, Inc.	: 201-773-6300	: 1401 Broad St., Clifton, NJ 07015.
EHC	: Ethichem Corp	: 201-933-7881	: 150 Grand St., Carlstadt, NJ 07072.
TNA	: Ethyl Corp	: 804-788-5000	: 330 S. 4th St., Richmond, VA 23231.
TNA	: Polymer Div	: 804-644-6081	: 8000 G.S.R.I. Rd., Baton Rouge, LA 70808.
ENJ	: Exxon Chemical Americas	: 713-870-6184	: P. O. Box 3272, Houston, TX 77001.
	: FMC Corp.:		
FMN	: Agricultural Chemical Group	: 215-299-6000	: 2000 Market St., Philadelphia, PA 19103.
FMB	: Industrial Chemical Group	: 215-299-6000	: 2000 Market St., Philadelphia, PA 19103.
FMP	: Industrial Chemical Group	: 215-299-6000	: 2000 Market St., Philadelphia, PA 19103.
FMB	: Specialty Chemicals Div	: 215-299-6000	: Sawyer Ave. & River Rd., Town of Tonswanda, NY 14150.
FRP	: FRP Co	: 912-367-3616	: P. O. Box 349, Baxley, GA 31513.
FAB	: Fabricolor Manufacturing Corp	: 201-742-3900	: 24-1/2 Van Houten St., Paterson, NJ 07509.
FMT	: Fairmont Chemical Co., Inc	: 201-344-5790	: 117 Blanchard St., Newark, NJ 07105.
PRI	: Farmland Industries, Inc	: 816-459-6407	: P. O. Box 7305, Kansas City, MO 64116.
FEL	: Felton International, Inc	: 212-497-4664	: 599 Johason Ave., Brooklyn, NY 11237.
FER	: Ferro Corp.:		
	: Ferro Chemical Div	: 216-641-8580	: 7050 Krick Rd., Bedford, OH 44146.
	: Grant Chemical Div	: 504-634-6801	: P. O. Box 263, Baton Rouge, LA 70821.
	: Kell Chemical Div	: 219-931-2630	: 3000 Sheffield Ave., Hammond, IN 46320.
	: Ottawa Chemical Div	: 419-691-3507	: 700 N. Wheeling St., Toledo, OH 43605.
	: Productual Chemical Div	: 213-945-3401	: 10051 Romsgdel Ave., Santa Fe Springs, CA 90670.
FND	: Fiber Industries, Inc	: 704-554-2731	: P. O. Box 10038, Charlotte, NC 28201.
RBC	: Fike Chemicals, Inc	: 304-755-3336	: P. O. Box 546, Nitro, WV 25143.
FTX	: Finetex, Inc	: 201-797-4686	: 418 Palmouth Ave., Elmwood Park, NJ 07407.
	: Firestone Tire & Rubber Co.:		
FRF	: Firestone Fibers & Textile Co	: 216-379-7000	: P. O. Box 450, Hopewell, VA 23869.
FRS	: Firestone Synthetic Rubber & Latex Co. Div.	: 216-379-7000	: P. O. Box 2786, Akron, OH 44301.
	: First Chemical Corp	: 601-762-0870	: P. O. Box 1427, Pascagoula, MS 39567.
FPC	: Flambeau Paper Corp	: 715-762-3231	: 200 First Ave., N., Park Falls, WI 54552.
PLM	: Fleming Laboratories, Inc	: 704-372-5613	: 2205 Thrift Rd., P. O. Box 34384, Charlotte, NC 28234.
	: Flint Ink Corp., Cal/Ink Div	: 415-525-1188	: 1404 4th St., Berkeley, CA 94710.
FTE	: Foote Mineral Co	: 215-363-6500	: Route #100, Exton, PA 19341.
FOM	: Formica Corp., Sub. of American Cyanamid Co.	: 201-831-2000	: 10155 Reading Dr., Cincinnati, OH 45241.
FDM	: Formosa Plastic Corp., Boston Route Site.	: 504-356-3341	: P. O. Box 271, Gulf State Rd., Baton Rouge, LA 70821.
FJI	: Foy-Johnston, Inc	: 513-631-4270	: 1776 Mentor Ave., Cincinnati, OH 45212.
FKE	: Frank Enterprises, Inc	: 614-253-5519	: 700 Rose Ave., Columbus, OH 43219.
FLN	: Franklin Chemical Industries	: 614-443-0241	: 2020 Bruck St., Columbus, OH 43207.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
FRE	: Freeman Chemical Corp-----	: 414-284-5541	: P. O. Box 247, Port Washington, WI 53074.
FB	: Fritzsche Dodge & Olcott, Inc-----	: 212-929-4100	: 76 9th Ave., New York, NY 10011.
CNI	: Frye Copsystems, Inc., Conap Div-----	: 716-372-9650	: 1405 Buffalo St., Olean, NY 14760.
FLH	: H. B. Fuller Co-----	: 513-891-6513	: 4450 Malsbary Rd., Blue Ash, OH 45242.
GAF	: GAF Corp., Chemical Group-----	: 201-862-2600	: P. O. Box 12, Linden, NJ 07036.
GBF	: GB Fermentation Industries, Inc-----	: 704-527-9000	: 5550 77 Center Dr., P. O. Box 241068, : Charlotte, NC 28224.
GLX	: Galaxie Chemical Corp-----	: 201-279-0558	: 26 Piercy St., Paterson, NJ 07524.
GAN	: Gane's Chemicals, Inc-----	: 212-391-2580	: 1144 Avenue of the Americas, New York, NY 10036.
GE	: General Electric Co-----	: 614-622-5310	: 1350 S. Second St., Coshocton, OH 43812, and : 413-494-4747
GEI	: Laminated & Insulating Materials : Business Dept.	: 518-385-2211	: 1 Campbll Rd., Schenectady, NY 12306.
SPD	: Silicone Products Dept-----	: 518-237-3330	: Mechanicville Rd., Bldg. 11-24, Waterford, : NY 12188.
GNF	: General Foods Corp., Maxwell House : Coffee Div.	: 201-420-3300	: 1125 Hudson St., Hoboken, NJ 07030.
GLC	: General Latex & Chemical Corp-----	: 617-864-7750	: 666 Main St., Cambridge, MA 02139.
GNT	: General Tire & Rubber Co., Chemical : Div.	: 216-798-3305	: 1 General St., Akron, OH 44329.
GRG	: P. D. George Co----- : Georgia-Pacific Corp.:	: 314-621-5700	: 5200 N. 2d St., St. Louis, MO 63147.
FSP	: Bellingham Div-----	: 206-733-4410	: P. O. Box 1236, Bellingham, WA 98225.
GP	: Houston Div-----	: 503-222-5561	: P. O. Box 1959, Pasadena, TX 77501.
GP	: Plaquemine Div-----	: 504-687-6321	: P. O. Box 629, Plaquemine, LA 70764.
CP	: Resins Operations-----	: 404-491-1244	: P. O. Box 105042, Atlanta, GA 30348.
SKO	: Getty Refining & Marketing Co-----	: 918-560-6000	: P. O. Box 1650, Oil Center Bldg., Tulsa, OK 74102.
TID	: Delaware Refinery-----	: 918-560-6010	: Delaware City, DE 19706.
TNI	: The Gillette Co., Chemical Div-----	: 617-421-7000	: 3500 W. 16th St., N. Chicago, IL 60064.
GIV	: Glvaudan Corp-----	: 201-365-8000	: 100 Delaware Ave., Clifton, NJ 07014.
GLY	: Glyco, Inc-----	: 203-622-1500	: 51 Weaver St., Greenwich, CT 06830.
GPI	: Goodpasture, Inc-----	: 806-637-2541	: P. O. Drawer 921, Brownfield, TX 79316.
BFG	: B. F. Goodrich Co., B. F. Goodrich : Chemical Group.	: 216-447-6000	: 6100 Oak Tree Blvd., Cleveland, OH 44131.
GYR	: Goodyear Tire & Rubber Co----- : W. R. Grace & Co.:	: 216-796-2121	: 1144 E. Market St., Akron, OH 44316.
GCC	: Agricultural Chemicals Group, : Memphis Plant.	: 901-357-2311	: P. O. Box 27147, Memphis, TN 38127.
HMP	: Organic Chemicals Div-----	: 617-861-6600	: 55 Hayden Ave., Lexington, MA 02173.
EVN	: Evans Chemetics-----	: 203-655-8741	: 90 Tokeneke Rd., Darien, CT 06820.
GRD	: Polymers & Chemicals Div-----	: 617-861-6600	: 55 Hayden Ave., Lexington, MA 02173.
GPC	: Grain Processing Corp-----	: 319-264-4211	: P. O. Box 349, Muscatine, IA 52761.
CPC	: Grant Chemical Co-----	: 201-791-6700	: P. O. Box 360, Elmwood Park, NJ 07407.
GRA	: Great American Chemical Corp-----	: 617-343-6973	: P. O. Box 2150, Pitsburgh, MA 01420.
GTL	: Great Lakes Chemical Corp-----	: 317-463-2511	: P. O. Box 2200, Highway 52 NW., West Lafayette, : IN 47906.
GNW	: Greenwood Chemical Co-----	: 703-456-6832	: P. O. Box 26 - State Highway #690, Greenwood, : VA 22943.
GDC	: Gresto, Inc-----	: 919-475-8101	: 216 E. Holly Hill Rd., Thomasville, NC 27360.
GRO	: A. Groos & Co., Millmaster Onyx : Group, Kewanee Industries, Inc.	: 201-344-3216	: 625 Doremus Ave., Newark, NJ 07105.
GRV	: Gusrdaman Chemical, Inc-----	: 616-452-5181	: 1350 Steele Ave., S.W., Grand Rapids, MI 49507.
GOC	: Gulf Oil Corp., Gulf Oil Chemicals : Co.-U.S.	: 713-754-2973	: P. O. Box 3766, Houston, TX 77001.
GTH	: Guth Corp-----	: 312-547-7030	: 322 S. Center St., Hillside, IL 60162.
HNC	: H & N Chemicals Co-----	: 201-256-7777	: 90 Maltese Dr., Totowa, NJ 07512.
HAR	: Haarmann and Reimer Corp-----	: 201-686-3132	: 111 Route 22, Spring Ridge, NJ 07081.
HAC	: C. P. Hall Co-----	: 312-767-4600	: 7300 S. Central Ave., Chicago, IL 60638.
FOL	: Handschy Industries, Inc., Parac Oil : and Chemical Div.	: 312-468-4900	: 13601 S. Ashland Ave., Riverdale, IL 60627.
HAN	: Hanna Chemical Coatings Corp-----	: 614-294-3361	: 1313 Windsor Ave., P. O. Box 147, Columbus, : OH 43216.
HSB	: Harshaw Chemical Co-----	: 216-721-8300	: 1945 E. 97th St., Cleveland, OH 44106.
HRT	: Hart Products Corp-----	: 201-433-6639	: 173 Sussex St., Jersey City, NJ 07302.
HCC	: Hatco Chemical Corp-----	: 201-738-1000	: King George Post Rd., Fords, NJ 08863

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS,  
BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
HKY	Hawkeye Chemical Co	319-243-5800	P. O. Box 899, Clinton, IA 52733.
HAP	Helmerich and Payne, Inc., Natural Gas Odorizing Div.	713-424-5568	3601 Decker Dr., P. O. Box 4176, Baytown, TX 77520.
SCP	Henkel Corp	612-830-7831	4620 W. 77th St., Minneapolis, MN 55435.
HCF	Hercofina	919-343-1150	310 N. Front St., Wilmington, DE 28402.
HCR	Hercor Chemical Corp	809-843-3030	Petrochemical Complex, Ponce, PR 00731.
HPC	Hercules, Inc	302-575-5000	910 Hercules Tower, Wilmington, DE 19899.
PFW	PFW Div	914-343-1900	33 Sprague Ave., Middletown, NY 10940.
HER	Heresite-Saekaphen, Inc	414-684-6646	822 S. 14th St., Manitowoc, WI 54220.
HTN	Heterene Chemical Co	201-278-2000	790 21st Ave., Paterson, NJ 07513.
HET	Heterochemical Corp	516-561-8225	111 E. Hawthorne Ave., Valley Stream, NY 11582.
HEC	Hewchem	601-863-6600	2500 - 33d Ave., P. O. Box 188, Gulfport, MS 39501.
HEW	Hewitt Soap Co., Inc	513-253-1151	333 Linden Ave., Dayton, OH 45403.
HEX	Hexagon Laboratories, Inc	212-324-7550	4166 Boston Rd., Bronx, NY 10475.
HXL	Hexcel Corp., Hexcel Chemical Products.	201-472-6800	205 Main St., Lodi, NJ 07644.
HIP	High Point Chemical Corp	919-883-1433	P. O. Box 2316, High Point, NC 27261.
HDC	Hodag Chemical Corp	312-675-3950	7247 N. Central Park Ave., Skokie, IL 60076.
HOF	Hoffman-LaRoche, Inc	201-235-5000	340 Kingsland St., Nutley, NJ 07110.
HCP	Honig Chemical & Processing Corp	201-344-0881	414 Wilson Ave., Newark, NJ 07105.
HK	Hooker Chemical Corp.; Hooker Chemicals & Plastics Corp.;		
HKD	Durez Div	716-696-6000	Walck Rd., N. Tonawanda, NY 14121.
HK	Industrial Chemicals Group	716-286-3000	360 Rainbow Blvd. S., Niagara Falls, NY 14303.
HKP	PVC Div	215-326-2000	P. O. Box 699, Pottstown, PA 19464.
EFH	E. F. Houghton & Co	215-666-4000	Madison & Vau Buren Aves., P. O. Box 930, Valley Forge, PA 19482.
HML	Hummel Chemical Co	201-754-1800	P. O. Box 250, So. Plainfield, NJ 07080.
HMY	Humphrey Chemical Co	203-281-0012	P. O. Box 325, North Haven, CT 06473.
WAY	Philip A. Hunt Chemical Corp., Organic Chemical Div.	201-944-4000	One Wellington Rd., Lincoln, IN 02865.
HNT	Huntington Laboratories, Inc	219-356-8100	970 E. Tipton St., Huntington, IN 46750.
HGC	Huntsman Goodson Chemical Corp	801-278-5311	3760 Highland Dr., Suite #500, Salt Lake City, UT 84106.
HUS	Husky Industries, Inc	404-393-1430	62 Perimeter Center East, Atlanta, GA 30346.
HYN	Hynson, Westcott & Dunning, Inc	301-837-0890	Charles and Chase Sts., Baltimore, MD 21202.
ICI	ICI Americas, Inc; Chemical Specialties Co	302-575-3000 302-575-3000	Wilmington, DE 19897. Wilmington, DE 19897.
RAY	ITT Rayonier, Inc	203-348-7000	1177 Summer St., Stamford, CT 06904.
IRC	Independent Refining Corp	713-974-1878	1502 Augusta Dr., Houston, TX 77057.
IGC	Indiana Gas & Chemical Corp	812-232-0231	1341 Hulman St., Terre Haute, IN 47808.
IND	Indol Color Co., Inc	201-242-1300	Leffert St., Carteret, NJ 07008.
IDC	Industrial Color, Inc	815-722-7402	Industry Ave., Joliet, IL 60435.
INL	Inland Steel Co., Inland Steel Container Co.	312-368-3535	4300 W. 130th St., Chicago, IL 60658.
ICF	Inmont Corp	201-365-3400	1255 Broad St., Clifton, NJ 07015.
ICC	Inmont Corp. Div. of United Technologies Corp.	201-427-6700	150 Wagaraw Rd., Hawthorne, NJ 07506.
SPC	Insilco Corp., Sinclair Paint Co. Div.	213-268-2511	3960 Washington Blvd., Los Angeles, CA 90023.
IFP	International Flavor and Fragrances, Inc.	212-765-5500	521 W. 57th St., New York, NY 10019.
IMC	International Minerals & Chemical Corp.; Foundry Products Div; IMC Chemical Group	812-232-0121 207-825-3341 312-564-8600 312-564-8600	P. O. Box 207, Terra Haute, IN 47808, and P. O. Box 149, Orrington, ME 04474. 17350 Ryan Rd., Detroit, MI 48200. 666 Garland Pl., Des Plaines, IL 60016.
IPP	International Pigment Processing Corp.	201-595-8181	200 Sheridan Ave., Paterson, NJ 07502.
IPC	Interplastic Corp	612-331-6850	2015 N.E. Broadway St., Minneapolis, MN 55413.
CCA	Interstab Chemicals, Inc	201-247-2202	500 Jersey Ave., New Brunswick, NJ 08903.
IRI	Ironsides Co	614-224-2228	270 W. Mount St., Columbus, OH 43215.
ISM	Isochem Resins Co	401-723-2100	99 Cook St., Lincoln, RI 02865.
JFR	George A. Jeffreys & Co., Inc	703-389-8220	P. O. Box 709, Salem, VA 24153.
JEN	Jennison-Wright Corp	419-382-3411	P. O. Box 691, Toledo, OH 43694.
JRG	Andrew Jergens Co	513-421-1400	2535 Spring Grove Ave., Cincinnati, OH 45214.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
JTO	Jetco Chemicals, Inc	214-872-3011	P. O. Box 1898, Corsicana, TX 75110.
UPF	Jim Walker Resources, Inc	205-254-7882	P. O. Box 5327, Birmingham, AL 35215.
JNS	S. C. Johnson & Son, Inc	414-631-2000	1525 Howe St., Racine, WI 52403.
JOB	Jones-Blair Co	214-353-1600	2728 Empire Central, Dallas, TX 75235.
JLS	Jones & Laughlin Steel Corp	412-227-4286	1600 W. Carson St., Pittsburgh, PA 15263.
JOR	Jordan Chemical Co	215-583-7000	1830 Columbia Ave., Polcraft, PA 19032.
	Kaiser Aluminum & Chemical Corp.:		
SNI	Kaiser Agricultural Chemicals Div	912-964-4311	Highway 21, Ft. Wentworth, GA 31407.
KAI	Kaiser Chemicals	415-271-5580	P. O. Box 337, Gramercy, LA 70052.
KLM	Kalama Chemical, Inc	206-682-7890	Suite 1110, Bank of California Center, Seattle, WA 98164.
KF	Kay-Fries Inc., Member Dynamit Nobel Group	201-784-0200	10 Link Dr., Rockleigh, NJ 07647.
KMP	Kelly-Moore Paint Co., Inc	415-592-8337	987 Commercial St., San Carlos, CA 94070.
CBM	Kennecott Corp	716-297-2000	P. O. Box 477, Niagara Falls, NY 14302.
	Kennecott Minerals Co.:		
KCU	Utah Copper Div	801-322-6123	P. O. Box 6500, Salt Lake City, UT 84106.
KPT	Kenrich Petrochemicals, Inc	201-436-5702	P. O. Box 32, Bayonne, NJ 07002.
KYS	Keysor Corp	805-259-2360	P. O. Box 308, Saugus, CA 91350.
KCW	Keystone Color Works, Inc	717-854-9541	151 W. Gay Ave., York, PA 17403.
CHF	Kincaid Enterprises, Inc	304-755-3377	P. O. Box 671, Nitro, WV 25143.
KNP	Knapp Products, Inc	201-478-7945	187 Garibaldi Ave., Lodi, NJ 07644.
KHI	Koch Industries, Inc., Koch Refining Co.	316-832-5496	P. O. Box 2302, Wichita, KS 67201.
KON	H. Kohnstamm & Co., Inc	212-620-4800	161 Avenue of the Americas, New York, NY 10013.
KMC	Komac Paint, Inc		P. O. Box 546, Denver, CO 80201.
KPT	Koppers Co., Inc	412-227-2000	Koppers Bldg., Pittsburgh, PA 15219.
LCP	LCP Chemicals-West Virginia, Inc	304-843-1310	P. O. Drawer "J", Moundsville, WV 26041.
LKY	Lake States Div. of Rhineland Paper Co.	715-369-4356	515 W. Davenport St., Rhineland, WI 54501.
LUR	Laurel Products Corp	215-423-5300	2600 E. Tioga St., Philadelphia, PA 19134.
LEA	Leatex Chemical Co	215-739-6324	2722 N. Hancock St., Philadelphia, PA 19133.
LLI	Lee Laboratories, Inc	804-862-1990	2999 Frontage Rd., P. O. Box 1658, Petersburg, VA 23805.
SAR	Leksi, Inc	215-521-3800	Gov. Printz Blvd. & Wanamaker Ave., P. O. Box 56, Essington, PA 19029.
LEL	Leland Chemical Co	704-623-1731	P. O. Box 399, Salisbury, NC 28144.
LEV	Lever Brothers Co	212-688-6000	390 Park Ave., New York, NY 10022.
LVR	C. Lever Co., Inc	215-639-8640	736 Dunks Ferry Rd., Bensalem, PA 19020.
BLS	Life Savers, Inc	212-621-7500	Eric St., Canajoharie, NY 13317.
LIL	Eli Lilly & Co	317-261-0111	307 E. McCarty St., Indianapolis, IN 46285, and 809-757-4150
LIC	Lilly Industrial Coatings, Inc	317-634-8512	546 Abbott St., Indianapolis, IN 46225.
BRD	Lonza, Inc	201-794-2400	22-10 Route 208, Fair Lawn, NJ 07410.
LC	Lord Corp., Chemical Products Group	814-868-3611	2000 W. Grandview Blvd., P. O. Box 10038, Erie, PA 16514.
MAK	MAK Chemical Corp	317-288-4464	1200 Rochester Ave., P. O. Box 2423, Muncie, IN 47302.
ORA	M & T Chemicals, Inc	201-499-0200	P. O. Box 889, Laurens, SC 29360.
SOR	MW Manufacturing, Southern Resin Div.	703-483-0211	P. O. Box 68, Thomasville, NC 27360.
TZC	Magnesium Elektron, Inc	201-782-5800	Star Route A, Box 202-1, Flemington, NJ 08822.
MGR	Magruder Color Co., Inc	201-242-1300	1029 Newark Ave., Elizabeth, NJ 07201.
MAL	Mallinckrodt, Inc	314-895-2496	675 McDonnell Blvd., P. O. Box 5480, St. Louis, MO 63134.
MOR	Marathon Morco Co	713-337-1534	P. O. Drawer C, Dickinson, TX 77539.
MOC	Marathon Oil Co., Texas Refining Div.	419-422-2121	539 S. Main St., Findlay, OH 48540.
MRD	Marden-Wild Corp	617-666-0400	P. O. Box 499, 500 Columbia St., Somerville, MA 02143.
MRV	Marlowe-Van Loan Corp	919-886-7126	P. O. Box 1851, High Point, NC 27261.
SDC	Martin-Marietta Corp., Sodyeco Div	704-827-9657	P. O. Box 33429, Charlotte, NC 28233.
MRX	Max Marx Color & Chemical Co	201-373-7801	192 Coit St., Irvington, NJ 07111.
MCA	Masonite Corp., Alpine Chemical Div	601-863-5772	P. O. Box 2392, Gulfport, MS 39503.
MYO	Mayo Chemical Co	404-696-6711	5544 Oakdale Rd., Smyrna, GA 30080.



TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
MCC	McCloskey Varnish Co-----	215-624-4400	7600 State Rd., Philadelphia, PA 19136.
MCC	McCloskey Varnish Co. of the Northwest-----	503-226-3751	4155 N.W. Yeon Ave., Portland, OR 97210.
MCC	McCloskey Varnish Co. of the West-----	213-726-7272	5501 E. Slauson, Los Angeles, CA 90040.
STG	McCormick & Co., Inc., McCormick/ Stange Flavor Div-----	312-733-6945	342 N. Western Ave., Chicago, IL 60612.
MGK	McLaughlin Gormley King Co-----	612-544-6341	8810 10th Ave. N., Minneapolis, MN 55427.
MLC	McLamine Chemicals, Inc-----	504-473-3121	P. O. Box 748, Donaldsonville, LA 70346.
MRK	Merck & Co., Inc-----	201-574-4000	126 E. Lincoln Ave., P. O. Box 2000, Rahway, NJ 07065.
MER	Merichem Co-----	713-455-1311	1914 Haden Rd., Houston, TX 77015.
LKL	Merrell Dow Pharmaceutical, Inc-----	513-948-9111	2110 E. Galbraith Rd., Cincinnati, OH 45215.
MLS	Miles Laboratories, Inc., Biotechnology Group-----	219-264-8111	P. O. Box 932, Elkhart, IN 46515.
MLL	Milliken & Co., Milliken Chemical Co-----	803-472-9041	P. O. Box 817, Inman, SC 29349.
BKL	Millmaster Chemical Co. Div-----	212-687-2757	99 Park Ave., New York, NY 10016.
RPC	Kewanee Industries, Inc-----	212-687-2757	Coronet Dr., Dalton, GA 30720.
MMM	Minnesota Mining & Manufacturing Co-----	612-736-0940	3M Center, St. Paul, MN 55144.
MIR	Miranol Chemical Co., Inc-----	201-329-3900	P. O. Box 411, Dayton, NJ 08810.
MSC	Mississippi Chemical Corp-----	601-746-4131	P. O. Box 388, Yazoo City, MS 39194.
CHG	Mobay Chemical Corp-----	816-242-2000	P. O. Box 4913, Hawthorne Rd., Kansas City, MO 64120.
VPC	Dyes & Pigments Div-----	201-686-3700	Iorio Ct., Union, NJ 07083.
HRC	Pigments Dept-----	412-777-2000	P. O. Box 419, Hawthorne, NJ 07507.
MOB	Pittsburgh Div-----	412-777-2000	Penn Lincoln Pkwy. W., Pittsburgh, PA 15205.
SM	Mobil Oil Corp-----	703-849-3000	P. O. Box 900, Dallas, TX 75221.
	Gas Liquids Dept-----	212-883-4242	P. O. Box 726, Paramus, NJ 07652.
	Mobil Chemical Co-----	201-467-8500	P. O. Box M-1, Short Hills, NJ 07078.
	Chemical Coatings Div-----	713-871-5802	One Greenway Plaza - Suite 1100, Houston, TX 77046.
	Petrochemicals Div-----	804-798-2327	P. O. Box 26683, Richmond, VA 23261.
	Phosphorus Div-----	201-345-8220	76 E. 24th St., Paterson, NJ 07544.
MOA	Mona Industries, Inc-----	504-673-6161	P. O. Box 488, Geismar, LA 70734.
MNO	Monochem, Inc-----	314-694-1000	800 N. Lindbergh Blvd., St. Louis, MO 63166.
MON	Monsanto Co-----	201-964-3250	2401 Morris Ave., P. O. Box 219, Union, NJ 07083.
MTO	Montrose Chemical Corp. of California-----	216-781-8383	2301 Scranton Rd., Cleveland, OH 44113.
MCI	Mooney Chemicals, Inc-----	803-583-8441	314 W. Henry St., P. O. Box 1799, Spartanburg, SC 29304.
MCP	Moretex Chemical Products, Inc-----	312-621-5555	2 N. Riverside Plaza, Chicago, IL 60606.
MRT	Morton Chemicals Co. Div-----	607-335-2111	17 Eaton Ave., Norwich, NY 13815.
NOR	Norwich Eaton Pharmaceutical Div-----	803-963-4261	P. O. Box 368, Greenville, SC 29602.
TCI	Texize Div-----	608-244-2904	P. O. Box 8422, Madison, WI 53704.
MOT	Tomcoke, Inc-----	615-379-5531	Mt. Joy Rd., P. O. Box 69, Mt. Pleasant, TN 38474.
MTP	Mount Pleasant Chemical Co-----	216-831-0404	P. O. Box 22930, Beechwood, OH 44122.
PNX	Murphy-Phoenix Co-----	212-621-9400	1230 Avenue of the Americas, New York, NY 10020.
NTL	NL Industries, Inc-----	513-871-8800	P. O. Box 429, Pryor, OK 74361.
CHN	N-REn Corp., Cherokee Nitrogen Div-----	201-773-3900	199 Main St., Lodi, NJ 07644.
LEM	Napp Chemicals, Inc-----	312-722-0120	3127 W. Lake St., Chicago, IL 60612.
NTB	National Biochemical Co-----	312-846-7300	601 W. 80th St., Chicago, IL 60620.
NTC	National Casein Co-----	609-829-1880	P. O. Box 226, Riverton, NJ 08077.
NCJ	National Casein of New Jersey-----	212-949-5000	99 Park Ave., New York, NY 10016.
USJ	National Distillers & Chemicals Corp.-----	212-949-5000	99 Park Ave., New York, NY 10016.
	U.S. Industrial Chemicals Co-----	215-482-6600	4601 Flat Rock Rd., Philadelphia, PA 19127.
NMC	National Petro Chemicals Corp-----	201-685-5000	10 FINDERNE Ave., Bridgewater, NJ 08876.
NMS	National Milling & Chemical Co-----	313-297-2100	Foot of Tecumseh, Ecorse, MI 48229.
NTS	National Starch & Chemical Corp-----	914-782-8171	Route 17, Harriman, NY 10926.
NEP	Nepera Chemical Co., Inc-----	412-331-4200	Neville Island P. O., Pittsburgh, PA 15225.
NEV	Neville Chemical Co-----	716-285-1474	400 47th St., Niagara Falls, NY 14302.
NCC	Niacet Corp-----	213-830-2253	2060 E. 220th St., Long Beach, CA 90810.
NLO	Niklor Chemical Co., Inc-----	616-683-3377	225 Fort St., Niles, MI 49120.
NCP	Niles Chemical Paint Co-----	219-255-9678	P. O. Box 930, Mishawaka, IN 46544.
	Kordell Industries Div-----		

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
NIL	: Nilok Chemicals, Inc-----	: 513-841-4000	: 2235 Langdon Farm Rd., Cincinnati, OH 45230.
CNP	: Nipro, Inc-----	: 404-823-4000	: P. O. Box 1483, Augusta, GA 30903.
NOC	: Norac Co., Inc-----	: 213-334-2908	: 405 S. Motor Ave., Azusa, CA 91703.
	: Mathe Div-----	: 201-779-4981	: 169 Kennedy Dr., P. O. Box 2230, Lodi, NJ 07644.
LMI	: North American Chemical Co-----	: 617-686-2907	: 19 S. Canal St., Lawrence, MA 01843.
NWP	: Northern Petrochemical Co-----	: 402-633-5682	: 2223 Dodge St., Omaha, NB 68102.
NW	: Northwestern Chemical Co-----	: 312-231-6111	: 120 N. Aurora St., W. Chicago, IL 60185.
NPC	: Northwest Petrochemical Corp-----	: 206-293-3176	: P. O. Box 99, Anacortes, WA 98221.
NCW	: Nostrip Chemical Works, Inc-----	: 690-299-5600	: P. O. Box 160, Pedricktown, NJ 08067.
CAD	: Noury Chemical Corp-----	: 716-778-8554	: 2153 Lockport-Olcott Rd., Burt, NY 14028.
NUT	: Nutrius, Inc-----	: 216-589-4400	: 1100 Superior Ave., Cleveland, OH 44114.
	:-----	:-----	:-----
OBC	: O'Brien Corp-----	: 415-761-2300	: 450 E. Grand Ave., S. San Francisco, CA 94080.
OMC	: Olin Corp-----	: 203-356-2000	: 120 Long Ridge Rd., Stamford, CT 06904.
	: Specialty Chemicals Dept-----	: 203-356-2000	: P. O. Box 991, Little Rock, AR 72203.
HLI	: Onyx Chemical Co-----	: 312-371-2000	: 14000 S. Seeley Ave., Blue Island, IL 60406.
ONX	: Onyx Chemical Co-----	: 201-434-1700	: 190 Warren St., Jersey City, NJ 07302.
OPC	: Orbis Products Corp-----	: 201-824-3144	: 140 Route 10, E. Hanover, NJ 07936.
ORG	: Organics, Inc./LaGrange Labs, Inc-----	: 312-764-6700	: 7125 N. Clark St., Chicago, IL 60626.
BSW	: Original Bradford Soap Works, Inc-----	: 401-821-2141	: 200 Providence St., W. Warwick, RI 02893.
CJO	: C. J. Osborn Chemicals, Inc-----	: 609-662-0128	: 420 Sherman Ave., Pennsauken, NJ 08109.
OCF	: Owens-Corning Fiberglas Corp-----	: 419-248-8000	: Fiberglas Tower, Toledo, OH 43659.
	:-----	:-----	:-----
PBI	: PBI/Gordon Corp-----	: 816-421-4070	: 1217 W. 12th St., Kansas City, MO 64101.
PLB	: P-L Biochemicals, Inc-----	: 414-347-7300	: 1037 W. McKinley Ave., Milwaukee, WI 53201.
PPG	: PPG Industries, Inc-----	: 412-434-3131	: 1 Gateway Center, Pittsburgh, PA 15222.
PAC	: Pacific Anchor Chemical Corp-----	: 213-725-1800	: 6055 E. Washington Blvd., Suite 700, Los Angeles, CA 90040.
	:-----	:-----	:-----
AMR	: Pacific Resins & Chemicals, Inc-----	: 206-572-8181	: 1754 Thorne Rd., Tacoma, WA 93421.
PNT	: Pantasote, Inc., Film/Compound Div-----	: 201-777-8500	: 26 Jefferson St., Passaic, NJ 07056.
FSC	: Passaic Color & Chemical Co-----	: 201-279-0400	: 28-36 Paterson St., Paterson, NJ 07501.
CHP	: C. H. Patrick & Co., Inc-----	: 803-244-4831	: P. O. Box 2526, Greenville, SC 29602.
PEK	: Peck's Products Co-----	: 314-385-5454	: 610 E. Clarence Ave., St. Louis, MO 63147.
PWL	: Peltron Corp-----	: 312-442-9100	: 7847 W. 47th St., Lyons, IL 60534.
AES	: Penetone Corp-----	: 201-567-3000	: 74 Hudson Ave., Tenafly, NJ 07670.
PAS	: Pennwalt Corp-----	: 215-587-7000	: 3 Parkway, Philadelphia, PA 19102.
WTL	: Lucidol Div-----	: 716-877-1740	: 1740 Military Rd., Buffalo, NY 14240.
PAR	: Pennzoil Co., Penreco Div-----	: 412-283-5600	: Union Bank Bldg., Butler, PA 16001.
FER	: Perry & Derrick Co., Inc-----	: 513-351-5800	: 2510 Highland Ave., Norwood, OH 45212.
PST	: Perstorp, Inc-----	: 413-584-2472	: 238 Nonotuck St., Florence, MA 01060.
UDI	: Petrochemicals Co., Inc-----	: 817-625-2111	: 600 E. Central St., P. O. Box 2199, Fort Worth, TX 76113.
	:-----	:-----	:-----
PTT	: Petro-Tex Chemical Corp-----	: 713-477-9211	: P. O. Box 2584, Houston, TX 77001.
PFN	: Pfanstiehl Laboratories, Inc-----	: 312-623-0370	: 1219 Glen Rock Ave., Waukegan, IL 60085.
PCW	: Pfister Chemical, Inc-----	: 201-945-5400	: Linden Ave., Ridgefield, NJ 07657.
PFZ	: Pfizer, Inc-----	: 212-573-2323	: 235 E. 42d St., New York, NY 10017.
	: Pfizer Pharmaceuticals, Inc-----	: 809-846-4300	: P. O. Box 628, Barceloneta, PR 00617.
PHR	: Pharmachem Corp-----	: 215-867-4654	: Stefko Blvd., Bethlehem, PA 18018.
EDI	: Phelps Dodge Industries, Inc., : Phelps Dodge Magnet Wire Co. Div.-----	: 219-456-4444	: 132 E. Creighton Ave., Fort Wayne, IN 46861.
	:-----	:-----	:-----
PPX	: Phillips Paraxylene, Inc-----	: 809-864-1515	: G.P.O. Box 4129, San Juan, PR 00936.
PLC	: Phillips Petroleum Co-----	: 918-661-6600	: 15 Al Phillips Bldg., Bartlesville, OK 74004.
PPR	: Phillips Puerto Rico Core, Inc-----	: 809-864-1515	: G.P.O. Box 4129, San Juan, PR 00936.
PHC	: Phthalchem, Inc-----	: 513-681-0099	: 6675 Beechlands Dr., Cincinnati, OH 45237.
PIC	: Pierce Chemical Co-----	: 815-968-0747	: 3747 N. Meridian Rd., Rockford, IL 61103.
PIL	: Pilot Chemical Co-----	: 213-723-0036	: 11756 Burke St., Santa Fe Springs, CA 90670.
PPL	: Pioneer Plastics Div. of LOP : Plastics, Inc.-----	: 207-784-9111	: Pionite Rd., Auburn, ME 04210.
	:-----	:-----	:-----
PIT	: Pitt-Consol Chemical Co-----	: 405-767-3456	: P. O. Box 1267, Ponca City, OK 74601.
PKL	: Plaskolite, Inc-----	: 216-294-3281	: 1770 Joyce Ave., Columbus, OH 43216.
PKP	: Plaskon Products, Inc-----	: 419-389-5600	: 2829 Glendale Ave., Toledo, OH 43614.
PSL	: Plasklok Corp-----	: 716-681-7755	: 3155 Broadway, Buffalo, NY 14227.
PLS	: Plastics Engineering Co-----	: 414-458-2121	: 3518 Lakeshore Rd., Sheboygan, WI 53081.
PMC	: Plastics Manufacturing Co-----	: 214-330-8671	: 2700 S. Westmoreland, Dallas, TX 75224.
PLX	: Plex Chemical Corp-----	: 415-471-6555	: 1205 Atlantic St., Union City, CA 94487.
PTC	: Polycast Technology Corp-----	: 203-327-6010	: 69 Southfield Ave., Stamford, CT 06902.
PCL	: Polychemical Laboratories, Inc-----	: 212-893-0333	: 490 Hunts Point Ave., Bronx, NY 10474.
PAI	: Polymer Applications, Inc-----	: 716-875-0775	: 3445 River Rd., Tonawanda, NY 14150.
PYZ	: Polyrez Co., Inc-----	: 609-845-1813	: P. O. Box 320, Woodbury, NJ 08096.
	:-----	:-----	:-----

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
PLR	: Polysar, Inc-----	: 617-537-9901	: 29 Fuller St., Leominster, MA 01453.
	: Latex Div-----	: 216-836-0451	: 1705 W. Market St., Akron, OH 44313.
	: Polysar Latex Div-----	: 615-892-4131	: 2200 Polymer Dr., Chattanooga, TN 37421.
PVI	: Polyvinyl Chemical Industries-----	: 617-658-6600	: 730 Main St., Wilmington, MA 01887.
POP	: Pope Chemical Corp-----	: 201-279-2702	: 33 6th Ave., Paterson, NJ 07524.
PRT	: Pratt & Lambert, Inc-----	: 916-873-6000	: P. O. Box 22, Buffalo, NY 14240.
PMP	: Premier Malt Products, Inc-----	: 414-347-7300	: 1000 N. Market St., Milwaukee, WI 53201.
PG	: Procter & Gamble Co., Procter & Gamble Mfg. Co.-----	: 513-763-5194	: P. O. Box 599, Cincinnati, OH 45201.
PC	: Procter Chemical Co-----	: 704-633-1731	: P. O. Box 399, Salisbury, NC 28144.
PRC	: Products Research & Chemical Corp-----	: 213-240-2060	: 5430 San Fernando Rd., P. O. Box 1800, Glendale, CA 91209.
PUB	: Publicker Industries, Inc-----	: 203-531-4500	: 777 W. Putnam Ave., Greenwich, CT 06830.
PRX	: Porex Corp-----	: 213-630-7487	: 5101 Clark Ave., Lakewood, CA 90712.
QCP	: Quaker Chemical Corp-----	: 215-828-4250	: Lime & Elm Sts., Conshohocken, PA 19428.
QKO	: Quaker Oats Co-----	: 312-222-7111	: 345 Merchandise Mart Plaza, Chicago, IL 60654.
QUN	: K. J. Quinn & Co., Inc-----	: 617-321-3200	: 195 Canal St., Malden, MA 02148.
QH	: Quintana Petrochemical Co-----	: 512-289-2600	: P. O. Box 4656, Corpus Christi, TX 78408.
RSA	: R.S.A. Corp-----	: 914-693-1818	: 690 Saw Mill River Rd., Ardsley, NY 10502.
RLS	: Rachele Laboratories, Inc-----	: 213-432-3956	: 700 Henry Ford Ave., Long Beach, CA 90801.
RCN	: Racon, Inc-----	: 316-524-3245	: P. O. Box 198, Wichita, KS 67201.
RAS	: Raffi and Swanson, Inc-----	: 617-658-3364	: 100 Eames St., Wilmington, MA 01887.
RAB	: Raybestos Manhattan, Industrial Div-----	: 203-371-0101	: 75 E. Main St., Stratford, CT 06497.
REG	: Regis Chemical Co-----	: 312-967-6000	: 8210 Austln Ave., Morton Grove, IL 60053.
REH	: Reheis Chemical Co. Div. of Armour : Pharmaceutical Co.-----	: 201-464-1500	: 235 Snyder Ave., Berkeley Hgts., NJ 07922.
RCI	: Reichhold Chemicals, Inc-----	: 914-682-5700	: 525 N. Broadway, White Plains, NY 10603.
RIL	: Reilly Tar & Chemical Corp-----	: 312-247-8141	: 1510 Market Square Center, 151 N. Delaware St., Indianapolis, IN 46204.
REL	: Reliance Universal, Inc., Louisville : Resins Operation.-----	: 502-459-9110	: P. O. Box 37510, Louisville, KY 40233.
REM	: Remington Arms Co., Inc-----	: 203-333-1112	: 939 Barnum Ave., Bridgeport, CT 06601.
RSC	: Republic Steel Corp-----	: 216-622-4650	: P. O. Box 6778, Cleveland, OH 44101.
RDA	: Rhone-Poulenc, Inc-----	: 201-846-7700	: 120 Jersey Ave., New Brunswick, NJ 08903.
RCD	: Richardson Co-----	: 312-297-3570	: 2400 E. Devon Ave., Dea Plaines, IL 60018.
	: Polymeric Systems Div-----	: 203-245-0441	: 15 Meiga Ave., Madison, CT 06443.
RCO	: Rico Chemical Corp-----	: 809-843-0020	: P. O. Box 387, Magas Ward, Guaynilla, PR 00656.
AMS	: Ridgway Color Co-----	: 814-776-2151	: 75 Front St., Ridgway, PA 15853.
RTC	: Riegel Textile Corp., H.I.T. : Chemicals Div.-----	: 803-242-6050	: Ware Shoals, SC 29692.
RIK	: Riker Laboratories, Inc., Sub. of : 3M Co.-----	: 213-341-1300	: 19901 Nordhoff St., Northridge, CA 91324.
RSN	: Rilsan Corp-----	: 201-447-3300	: 139 Harristown Rd., Glen Roc, NY 07452.
RT	: Ritter International-----	: 213-245-6886	: 4001 Goodwin, Los Angeles, CA 90039.
RIV	: Riverdale Chemical Co-----	: 312-756-2010	: 220 E. 17th St., Chicago Heights, IL 60411.
ROB	: Robeco Chemicals, Inc-----	: 212-986-6410	: 99 Park Ave., New York, NY 10016.
ORT	: Roehr Chemicals, Inc-----	: 212-784-8473	: 52-20 37th St., Long Island City, NY 11101.
RCG	: Rogers Corp., Molding Materials Div-----	: 203-774-9605	: P. O. Box 550, Rogers, CT 06263.
RH	: Rohm & Haas Co-----	: 215-592-3000	: Independence Mall West, Philadelphia, PA 19105.
ROM	: Roma Chemical, Inc-----	: 617-676-3481	: 749 Quequechan St., Fall River, MA 02722.
RUC	: Rubtcon Chemicals, Inc-----	: 504-673-6141	: P. O. Box 517, Geismar, LA 70734.
NES	: Ruetgers-Nease Chemical Co-----	: 814-238-2424	: P. O. Box 221, State College, PA 16801.
SCM	: SCM Corp.:		
	: Glidden Coatings & Resin Div-----	: 216-344-8000	: 900 Union Commerce Bldg., Cleveland, OH 44115.
	: Organic Chemicals Div-----	: 904-764-1711	: P. O. Box 389, Jacksonville, FL 32201.
	: PCR, Inc-----	: 904-376-8246	: P. O. Box 1466, Gainesville, FL 32602.
SOS	: SSC Industries, Inc-----	: 404-762-9651	: P. O. Box 90987, East Point, GA 30344.
NPR	: Safeway Stores, Inc-----	: 415-944-4000	: 2800 Ygnacio Valley Rd., Walnut Creek, CA 94621.
STX	: St. Croix Petrochemical Corp-----	: 809-773-6400	: P. O. Box 6801, Christstainsd., St. Croix, U.S., VI 00820.
SLM	: Salem Oil & Grease Co-----	: 617-745-0585	: 60 Grove St., Salem, MA 01970.
SAL	: Salsbury Laboratories, Inc-----	: 515-257-2422	: 2000 Rockford Rd., Charles City, IA 50616.
SBG	: Samuel Bingham Co-----	: 312-726-6711	: 11101 W. Franklin Ave., Franklin Park, IL 60131.
S	: Sandoz, Inc.:		
	: Colors & Chemicals Div-----	: 201-386-7500	: Route #10, E. Hanover, NJ 07936.
	: Crop Protection-----	: 714-298-4343	: 480 Camino Del Rio South, San Diego, CA 92108.
SCN	: Schenectady Chemicals, Inc-----	: 518-346-8711	: P. O. Box 1046, Schenectady, NY 12301.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
SBC	Scher Chemicals, Inc	201-471-1300	1 Styertowne Rd., Clifton, NJ 07012.
SCH	Schering Corp	201-558-4000	1011 Morris Ave., Union, NJ 07083.
SCO	Scholler, Inc	215-739-0900	Collins and Westmoreland Sts., Philadelphia, PA 19134.
SPR	Scientific Protein Laboratories, Inc.	608-849-5944	P. O. Box 158, Waunakee, WI 53597.
SPA	Scott Paper Co	215-521-5000	P. O. Box 925, Everett, WA 98206.
SEA	Seaboard Chemicals, Inc	617-745-1915	30 Foster St., P. O. Box 707, Salem, MA 01970.
SRL	G. D. Searle & Co., Searle Chemicals, Inc.	312-982-7000	4901 Searle Pkwy., Skokie, IL 60077.
SKP	Shakespeare Co., Monofilament Div	803-754-7011	P. O. Box 246, Columbia, SC 29204.
SHO	Shell Oil Co	713-241-6161	P. O. Box 2463, Houston, TX 77001.
SHC	Shell Chemical Co. Div	713-241-6161	P. O. Box 2463, Houston, TX 77001.
SGO	Shenango, Inc	412-771-4400	200 Neville Rd., Neville Island, Pittsburgh, PA 15225.
SHP	Shepherd Chemical Co	513-731-1110	4900 Beech St., Cincinnati, OH 45212.
SHX	Sherex Chemical Co., Inc	614-764-6531	P. O. Box 646, Dublin, OH 43017.
SW	Sherwin-Williams Co., Chemical Div	216-566-2000	P. O. Box 6520, Cleveland, OH 44113.
SHT	Shintech, Inc	713-965-0713	3800 Buffalo Speedway - Suite 210, Houston, TX 77098.
SID	George P. Siddal Co., Inc	803-576-1556	P. O. Box 925, Spartanburg, SC 29304.
VLN	SimCal Chemical Co	208-336-2110	2222 W. Shaw Ave., Fresno, CA 93721.
SMP	J. R. Simplot Co., Minerals & Chemical Div.	208-232-6620	P. O. Box 912, Pocatello, ID 83210.
SIM	Simpson Timber Co., Oregon Overlay Div.	503-289-1111	2301 N. Columbia Blvd., Portland, OR 97217.
GFS	G. Frederick Smith Chemical Co	614-224-5343	867 McKinley Ave., P. O. Box 23214, Columbia, OH 43223.
SK	SmithKline Beckman Corp., SmithKline Chemicals Div.	215-278-7000	900 River Rd., P. O. Box 900, Conshohocken, PA 19428.
SLT	Soltex Polymer Corp	713-522-1781	P. O. Box 1000, Deer Park, TX 77536.
SLC	Soluol Chemical Co., Inc	401-821-8100	Green Hill and Market Sts., Box 112, W. Warwick, RI 02893.
SAC	Southeastern Adhesive Co	704-754-3493	P. O. Box 791, Lenoir, NC 28645.
SOP	Southern Chemical Products Co., Inc - Southland Corp.	912-746-5147	430 Lower Boundary St., Macon, GA 31202.
ACT	Chemical Div	214-331-8391	7666 W. 63d St., Summit, IL 60501.
SOL	Fine Chemical Div	214-331-8391	5801 Marvin D. Lane Freeway, Dallas, TX 75233.
SWR	Southwestern Refining Co., Inc	512-884-8863	P. O. Box 9217, Corpus Christi, TX 78408.
SPL	Spaulding Fibre Co., Inc., Industrial Plastics Div.	716-692-2000	310 Wheeler St., Tonawanda, NY 14150.
SOI	Specialty Organics, Inc	213-962-2008	5623 N. 4th St., Irwindale, CA 91706.
OMS	E. R. Squibb & Sons, Inc	609-921-4000	P. O. Box 4000, Route 206 & Provinceline Rd., Princeton, NJ 08540.
TRD	Squibb Manufacturing, Inc., Renesa, Inc., Ersana, Inc.	809-852-1255	P. O. Box 609, Humacao, PR 00661.
SCC	Standard Chlorine of Delaware, Inc	201-997-1700	1035 Belleville Turnpike, Kearny, NJ 07032.
SOC	Standard Oil Co. of California, Chevron Chemical Co.	415-894-0850	575 Market St., San Francisco, CA 94105.
AMO	Standard Oil Company (Indiana)	312-856-6111	P. O. Box 5910-A, Mail Code 3501, Chicago, IL 60680.
SIO	Standard Oil of Ohio	216-575-4643	307 Midland Bldg., Cleveland, OH 44115.
STT	Standard T Chemical, Inc - Stauffer Chemical Co.	312-754-4471	P. O. Box A-3351, Chicago, IL 60690.
SPA	Agricultural Div	415-544-9000	636 California St., San Francisco, CA 94108.
SPC	Calbio Chemicals, Inc	415-544-9000	636 California St., San Francisco, CA 94108.
SFF	Food Ingredients Div	415-544-9000	636 California St., San Francisco, CA 94108.
SPI	Industrial Div	415-544-9000	636 California St., San Francisco, CA 94108.
SFP	Plastics Div	415-544-9000	636 California St., San Francisco, CA 94108.
SFS	Specialty Div	415-544-9000	636 California St., San Francisco, CA 94108.
SWS	SWS Silicones Div	415-544-9000	636 California St., San Francisco, CA 94108.
STP	Stepan Chemical Co	312-446-7500	RR #1, Elwood, IL 60421, and 100 West Hunter Ave., Maywood, NJ 07607.
	Sterling Drug, Inc.	201-845-3030	
SDH	Hilton Davis Chemical Co. Div	212-907-2000	2235 Langdon Farm Rd., Cincinnati, OH 45237.
SDW	Sterling Organics Div	212-907-2000	90 Park Ave., New York, NY 10016.
TMS	Thomasset Colors Div	212-907-2000	2235 Langdon Farm Rd., Cincinnati, OH 45237.
CIN	Stockhausen, Inc	919-378-9393	P. O. Box 16025, Greensboro, NC 27406.
SVC	Stokely-Van Camp, Inc., Industrial Products Group.	317-631-2251	15395 Jackson St., Janesville, WI 53545.



TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS,  
BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
SBP	Sugar Beet Products Co	517-799-4941	302 Waller St., P. O. Box 1387, Saginaw, MI 48605.
SNA	Sun Chemical Corp	212-986-5500	411 Sun Ave., Cincinnati, OH 45232.
SNW	Chemicals Div	201-224-4600	P. O. Box 70, Chester, SC 29706.
SUN	Sun Company, Inc	215-293-6699	100 Matsonford Rd., Radnor, PA 19087.
SKG	Sunkist Growers, Inc	213-986-9800	14130 Riverside Dr., Sherman Oaks, CA 91432.
SNO	SunOlin Chemical Co	215-485-0761	P. O. Box P, Claymont, DE 19703.
	Sybron Corp.:		
TCC	Chemical Div/Tanatex	716-546-4040	P. O. Box 125, Wellford, SC 29385.
IOC	Sybron Chemical Div	609-894-8211	Birmingham, NJ 08011.
JSC	Sybron Chemical Div	609-894-8211	Birmingham Rd., Birmingham, NJ 08011.
SYL	SylvaChem Corp	904-769-7651	2110-A W. 23d St., Panama City, FL 32405.
INP	Synair Corp	615-698-8801	2003 Amnicola Highway, P. O. Box 5269, Chattanooga, TN 37406.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	803-585-3661	P. O. Box 5627, Spartanburg, SC 29304.
FAR	Syncon Resins, Inc	201-589-1070	77 Jacobus Ave., S. Kearny, NJ 07032.
FCD	Synres Chemical Corp	201-964-5280	209 N. Michigan Ave., Kenilworth, NJ 07032.
HFT	Syntex Agribusiness, Inc	417-866-7291	P. O. Box 1246 S.S.S., Springfield, MO 65805.
SYT	Synthron, Inc	704-437-8611	P. O. Box 1111, Morganton, NC 28655.
TRA	Talleyrand Chemicals, Inc	617-998-2100	129 John Ventente Blvd., New Bedford, MA 02745.
TEK	Teknor Apex Co	401-725-8000	505 Central Ave., Pawtucket, RI 02661.
HN	Tenneco Chemicals, Inc	201-981-5000	P. O. Box 365, Piscataway, N.J. 08854.
TOC	Tenneco Oil Co., P & M	713-757-2635	P. O. Box 2511, Houston, TX 77001.
TVA	Tennessee Valley Authority, Chemical Accounting Brand.	205-386-2377	Muscle Shoals, AL 35660.
TER	Terra Chemicals International, Inc	712-277-1340	P. O. Box 1828, Sioux City, IA 51102.
TER	Terra Nitrogen, Inc	712-277-1340	P. O. Box 1828, Sioux City, IA 51102.
COO	Terrell Corp	616-658-3351	820 Woburn St., Wilmington, MA 01887.
TX	Texaco, Inc	713-666-8000	P. O. Box 430, Bellaine, TX 77401.
TUS	Texaco Butadiene Co	713-666-8000	P. O. Box 430, Bellaine, TX 77401.
TTA	Texas Alkyls, Inc	713-479-8411	P. O. Box 600, Deer Park, TX 77536.
TCR	Texas City Refining, Inc	713-945-4451	P. O. 1271, Texas City, TX 77590.
TXS	Textstyrene Plastics, Inc	817-831-0533	3607 N. Sylvania Ave., Fort Worth, TX 76111.
SKT	Textron, Inc., Spencer Kellogg Div	716-852-5850	120 Delaware Ave., Buffalo, NY 14240.
TKL	Thiokol Corp., Specialty Chemicals Div.	215-968-5911	P. O. Box 1000, Newtown, PA 18940.
MHI	Ventron Div	617-774-3100	150 Andovin St., Danvers, MA 01923.
TMH	Thompson Hayward Chemical Co	913-321-3131	5200 Speaker Rd., Kansas City, MO 66110.
TRC	Toms River Chemical Corp	201-349-5200	P. O. Box 71, Tom River, NJ 08753.
TRI	Triad Chemical	504-473-9231	P. O. Box 310, Donaldsonville, LA 70346.
TRN	Trinity Chemical Corp	512-341-6371	130 W. Rhapsody, San Antonio, TX 78216.
TRO	Troy Chemical Co	201-589-2500	One Avenue L, Newark, NJ 07105.
TUL	Tull Chemical Co	205-831-1154	P. O. Box 3246, Oxford, PA 36203.
TLG	Twin Lake Chemical, Inc	716-433-3824	P. O. Box 411, Lockport, NY 14094.
UPM	UOP, Inc., UOP Process Div	312-391-2000	10 UOP Plaza, Des Plaines, IL 60016.
UHL	Paul Uhlich & Co., Inc	914-478-2000	1 Railroad Ave., Hastings-on-Hudson, NY 10706.
UNG	Ungerer & Co	201-628-0600	4 Bridgewater Lane, P. O. Box U, Lincoln Park, NJ 07035.
WTH	Union Camp Corp	201-628-9000	P. O. Box 220, Dover, OH 44622.
NCI	Chemical Products Div	201-628-9000	1600 Valley Rd., Wayne, NJ 07470.
NCI	Terpene & Aromatics Div	201-628-9000	P. O. Box 60369, Jacksonville, FL 32236.
UCC	Union Carbide Corp	304-747-3255	P. O. Box 8004, S. Charlestown, WV 25303.
UOC	Union Oil Co. of California	213-977-7746	461 S. Baylston St., Los Angeles, CA 90017.
	Union Chemicals Div	213-977-6898	P. O. Box 60455, Los Angeles, CA 90060.
USR	Uniroyal, Inc., Uniroyal Chemical Div.	203-723-2000	Emic Bldg., Spencer St., Naugatuck, CT 06770.
UNN	United Chemical Corp. of Norwood	617-762-4057	Endicott St., Norwood, MA 02062.
UNO	United-Erie, Inc	814-456-7561	438 Huron St., Erie, PA 16512.
USB	U.S. Borax & Chemical Corp	213-381-5311	3075 Wilshire Blvd., Los Angeles, CA 90005.
USO	U.S. Oil Co	401-434-3000	P. O. Box 4228, E. Providence, RI 02914.

TABLE 1.--SYNTHETIC ORGANIC CHEMICALS: ALPHABETICAL DIRECTORY OF MANUFACTURERS, BY COMPANY, 1981--CONTINUED

IDENTIFICATION CODE	NAME OF COMPANY	TELEPHONE NUMBER	OFFICE ADDRESS
	U.S. Steel Corp.:		
USS	: Clairton Plant-----	: 412-433-1121	: 600 Grant St., Rm. 2316, Pittsburgh, PA 15230.
USS	: Fairfield Plant-----	: 412-433-1121	: 600 Grant St., Rm. 2316, Pittsburgh, PA 15230.
USS	: Gary Plant-----	: 412-433-1121	: 600 Grant St., Rm. 2325, Pittsburgh, PA 15230.
USS	: Genova Plant-----	: 412-433-1121	: 600 Grant St., Rm. 2316, Pittsburgh, PA 15230.
ARM	: USS Agri-Chemicals Div-----	: 404-572-4000	: 233 Peachtree St., Atlanta, GA 30301.
USS	: USS Chemicals Div-----	: 412-433-1121	: 600 Grant St., Rm. 2880, Pittsburgh, PA 15230.
UPJ	: Upjohn Co-----	: 616-323-4000	: 7000 Portage Rd., Kalamazoo, MI 49002.
CWN	: Fine Chemical Div-----	: 203-281-2722	: 410 Sackett Point Rd., North Haven, CT 06473.
	:	:	:
VAL	: Valchem Div. of United Merchants & Manufacturers, Inc.	: 212-930-3900	: 1407 Broadway, New York, NY 10018.
VSV	: Valentione Sugars, Inc., Valite Div.	: 504-943-2459	: 726 Whitney Bldg., New Orleans, LA 70130.
MNP	: The Valpar Corp-----	: 612-332-7371	: 1101 S. 3d St., Minneapolis, MN 55440.
VDM	: Van De Mark Chemical Co., Inc-----	: 716-433-6764	: 1 N. Transit Rd., Lockport, NY 14094.
VNC	: Vanderbilt Chemical Corp-----	: 203-744-3900	: 31 Taylor Ave., Bethel, CT 06801, and Rt. 2 - Box 54, Murray, KY 42071.
VND	: Van Dyk & Co., Inc-----	: 201-759-3225	: Main and Williams Sts., Belleville, NJ 07109.
VEL	: Veliscol Chemical Corp-----	: 312-670-4500	: 341 E. Ohio St., Chicago, IL 60611.
VTC	: Vertac Chemical Corp-----	: 901-767-6851	: P. O. Box 3, Vicksburg, MS 39180.
VIK	: Viking Chemical Co-----	: 612-333-0394	: 838 Baker Bldg., Minneapolis, MN 55402.
VIN	: Vineland Chemical Co., Inc-----	: 609-691-3535	: W. Wheat Rd., Vineland, NJ 08360.
VCC	: Vinings Chemical Co-----	: 404-436-1542	: 2555 Cumberland Pkwy., Suite 200, Atlanta, GA 30339.
VGC	: Virginia Chemicals, Inc-----	: 804-483-7000	: 3340 W. Norfolk Rd., Portsmouth, VA 23703.
SOH	: Vistron Corp-----	: 216-575-4141	: 1899 Guild Hall, Cleveland, OH 44126.
SIC	: Silmar Div-----	: 213-757-5141	: 12333 S. Van Ness Ave., Hawthorne, CA 90250.
VTM	: Vitamins, Inc-----	: 312-861-0700	: 200 E. Randolph Dr., Chicago, IL 60601.
PRO	: Vulcan Materials Co., Chemicals Div.	: 205-877-3000	: P. O. Box 7689, Birmingham, AL 35223.
	:	:	:
WJ	: Warner-Jenkinson Co-----	: 314-889-7600	: 2526 Baldwin St., St. Louis, MO 63106.
PD	: Warner-Lambert-----	: 201-540-2000	: 201 Tabor Rd., Morris Plains, NJ 07950.
WAG	: West Agro-Chemical, Inc-----	: 913-384-1660	: P. O. Box 1386, Shawnee Mission, KS 66222.
WCA	: West Coast Adhesives Co-----	: 503-286-3515	: 11104 N.W. Front Ave., Portland, OR 97231.
EW	: Westinghouse Electric Corp., Industrial Materials Div.	: 402-373-4622	: Manor, PA 15665.
WPG	: West Point-Pepperell, Inc., Griffitex Chemical Co. Sub.	: 205-745-5767	: 1900 Cunningham Dr., Opelika, AL 36801.
WVA	: Westvaco Corp., Polychemicals Dept-----	: 803-554-8350	: P. O. Box 70848, Charleston Heights, SC 29405.
WRD	: Weyerhaeuser Co-----	: 715-384-2141	: 1185 Palmetto Ave., Marshfield, WI 54449.
WBG	: The White and Bagley Co-----	: 617-791-3201	: P. O. Box 706, Worcester, MA 01613.
WHI	: White and Hodges, Inc-----	: 617-453-5192	: 576 Lawrence St., Lowell, MA 01852.
WCC	: White Chemical Corp-----	: 201-437-0050	: Foot of E. 22d St., Bayonne, NJ 07002.
WHL	: Whittmoyer Laboratories, Inc-----	: 717-866-2151	: 19 N. Railroad St., Myerstown, PA 17067.
APT	: Whittaker Corp., Whittaker Coatings & Chemicals.	: 213-475-9411	: 3134 California St., NE, Minneapolis, MN 55418.
WHW	: Whittemore-Wright Co., Inc-----	: 617-242-1180	: 62 Alford St., Boston, MA 02129.
WLN	: Wilmington Chemical Corp-----	: 302-658-3515	: P. O. Box 66, Wilmington, DE 19899.
WTC	: Witco Chemical Corp-----	: 201-573-2800	: 155 Tice Blvd., Woodcliff Lake, NJ 07675.
WBC	: Worthington Diagnostics Div. of Millipore Corp.	: 201-462-3838	: Halls Mill Rd., Freehold, NJ 07728.
WCL	: Wright Chemical Corp-----	: 919-655-2263	: Acme Station, Riegelwood, NC 28456.
WYC	: Wycon Chemical Co-----	: 713-877-6450	: 9 Greenway Plaza, Houston, TX 77046.
WYT	: Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.	: 215-688-4400	: 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.<sup>1</sup> General imports of benzenoid items entered in parts 1B and 1C totaled 6,581 million pounds with an entered value of \$1,205.9 million in 1981 compared with 5,591 million pounds with a foreign invoice value of \$1,075.6 million in 1980.<sup>2</sup> Details are 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, 27.9 percent of all the benzenoid imports under part 1B in 1981 came from West Germany; 23.2 percent, from Japan; 9.8 percent, from the United Kingdom; and 7.1 percent, from Switzerland.

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 21.7 percent of all finished benzenoid imports under part 1C in 1981 came from West Germany; 19.9 percent, from Japan; 15.1 percent, from the United Kingdom; and 13.4 percent, from Switzerland.

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<sup>1</sup>*Imports of Benzenoid Chemicals and Products, 1981*, USITC Publication 1272, July 1982.

<sup>2</sup>Entered value and foreign invoice value are comparable for 1980-81.





TABLE 2.--BENZENOID CHEMICALS AND PRODUCTS: SUMMARY OF U.S.  
GENERAL IMPORTS ENTERED UNDER SCHEDULE 4,  
PARTS 1B AND 1C, OF THE TSUS, 1981

Part	QUANTITY	PERCENT OF TOTAL QUANTITY	ENTERED VALUE	PERCENT OF ENTERED VALUE	UNIT ENTERED VALUE
	<u>1,000</u> <u>pounds</u>		<u>1,000</u> <u>pounds</u>		<u>Per</u> <u>pound</u>
Schedule 4, Part 1B and 1C, total-----	658,076	100.0	1,205,910	100.0	\$1.83
Schedule 4, Part 1B-	378,576	57.5	437,266	36.3	1.16
Schedule 4, Part 1C-	279,500	42.5	768,644	63.7	2.75

Source: Compiled by the U.S. International Trade Commission from records of the U.S. Customs Service.

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.



TABLE 3.--CYCLIC INTERMEDIATES: GLOSSARY OF SYNONYMOUS NAMES

COMMON NAME	STANDARD (CHEMICAL ABSTRACTS) NAME
A Acid-----	3,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Acetyl-p-phenylenediamine-----	4'-Aminoacetanilide.
1,2,4-Acid-----	4-Amino-3-hydroxy-1-naphthalenesulfonic acid (1-Amino-2-naphthol-4-sulfonic acid).
Acid yellow 9-----	6-Amino-3,4'-azodibenzenesulfonic acid.
p-Aminobenzenesulfonic acid-----	Sulfanilic acid and salt.
m-Aminobenzoyl J acid-----	4-Hydroxy-7-(m-aminobenzamido)-2-naphthalenesulfonic acid.
Aminoepisulfonic acid-----	8-Amino-1,6-naphthalenedisulfonic acid.
Amino C acid-----	7-Amino-1,3-naphthalenedisulfonic acid.
Amino J acid-----	6-Amino-1,3-naphthalenedisulfonic acid.
Amino R salt-----	3-Amino-2,7-naphthalenedisulfonic acid.
Aniline oil-----	Aniline
Antraflavic acid-----	2,6-Dihydroxyanthraquinone.
Anthrarufin-----	1,5-Dihydroxyanthraquinone.
Armstrong & Wynne's acid-----	4-Hydroxy-2-naphthalenesulfonic acid.
B Acid-----	5-Amino-4-hydroxy-1,7-naphthalenedisulfonic acid.
2B Acid-----	6-Amino-4-chloro-m-toluenesulfonic acid.
4B Acid-----	6-Amino-m-toluenesulfonic acid.
Benzal chloride-----	$\alpha,\alpha$ -Dichlorotoluene.
Benzanthrone-----	7H-Benz[de]anthracen-7-one.
Benzotrifluoride-----	$\alpha,\alpha,\alpha$ -Trichlorotoluene.
Bisphenol A-----	4,4'-Isopropylidenediphenol.
B.O.N.-----	3-Hydroxy-2-naphthoic acid.
Broenner's acid-----	6-Amino-2-naphthalenesulfonic acid.
Bromamine acid-----	1-Amino-4-bromo-2-anthraquinonesulfonic acid.
Bromobenzanthrone-----	3-Bromo-7H-benz[de]anthracen-7-one
C Acid (Cassella acid)-----	3-Amino-1,5-naphthalenedisulfonic acid.
C.A. Acid-----	3-Amino-6-chloro-4-sulfobenzoic acid.
C-Amine (Lake Red C acid)-----	2-Amino-5-chloro-p-toluenesulfonic acid.
Chicago Acid (SS acid)-----	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Chlorobenzanthrone-----	Chloro-7H-benz[de]anthracen-7-one.
Chromotropic acid-----	4,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Chrysazin-----	1,8-Dihydroxyanthraquinone.
1,6-Cleve's acid-----	5-Amino-2-naphthalenesulfonic acid.
1,7-Cleve's acid-----	8-Amino-2-naphthalenesulfonic acid.
Crocein acid-----	7-Hydroxy-1-naphthalenesulfonic acid.
2-Cyanopyridine-----	Picolonitrile.
3-Cyanopyridine-----	Nicotinonitrile.
Cyanuric chloride-----	2,4,6-Trichloro-s-triazine.
D Acid-----	6-Amino-1-naphthalenesulfonic acid.
DADI-----	Dianisidine diisocyanate
DDB-----	p-Dibutoxybenzene.
Decacyclene-----	Diacenaphtho[1,2-j:1',2'-l]fluoranthene.
Dehydrothio-p-toluidine-----	2-(p-Aminophenyl)-6-methylbenzothiazole.
Developer Z-----	3-Methyl-1-phenyl-2-pyrazolin-5-one.
o-Dianisidine-----	3,3'-Dimethoxybenzidine.
1,1'-Dianthrimide-----	1,1'-Iminodianthraquinone.
Dibenzanthrone-----	Violanthrone.
Dichlone-----	2,3-Dichloro-1,4-naphthoquinone.
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.
Dioxy S acid-----	4,5-Dihydroxy-1-naphthalenesulfonic acid.
Diphenyl Epsilon Acid-----	6,8-Dianilino-1-naphthalenesulfonic acid.
Durene-----	1,2,4,5-Tetramethylbenzene.
Epsilone Acid (Andresen's acid)-----	8-Hydroxy-1,6-naphthalenedisulfonic acid.
F Acid-----	7-Hydroxy-2-naphthalenesulfonic acid.
Fast Red C base-----	2-Nitro-p-toluidine [NH <sub>2</sub> =1].
Fast Scarlet R base-----	5-Nitro-o-anisidine [NH <sub>2</sub> =1].
Fischer's aldehyde-----	1,3,3-Trimethyl- $\delta^2,\alpha$ -indolineacetaldehyde.
Fischer's base-----	1,3,3-Trimethyl-2-methyleneindoline.
Freund's acid-----	4-Amino-2,7-naphthalenedisulfonic acid.

TABLE 3.--CYCLIC INTERMEDIATES: GLOSSARY OF SYNONYMOUS NAMES--CONTINUED

COMMON NAME	STANDARD (CHEMICAL ABSTRACTS) NAME
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, (8-Amino-1-naphthol-3,6-disulfonic acid).
Hellimellitene-----	1,2,3-Trimethylbenzene.
Indoxyl-----	3(2H)-Indolone.
Isodurene-----	1,2,3,5-Tetramethylbenzene.
J Acid-----	7-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
J Acid Urea-----	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid].
K Acid-----	4-Amino-5-hydroxy-1,7-naphthalenedisulfonic acid.
Koch's Acid-----	8-Amino-1,3,6-naphthalenetrisulfonic acid.
L Acid-----	5-Hydroxy-1-naphthalenesulfonic acid.
Lake Red C amine-----	2-Amino-5-chloro-p-toluenesulfonic acid.
Laurent's acid-----	5-Amino-1-naphthalenesulfonic acid.
M Acid-----	8-Amino-4-hydroxy-2-naphthalenesulfonic acid.
MEP-----	5-Ethyl-2-picoline (2-Methyl-5-ethylpyridine).
Mesitylene-----	1,3,5-Trimethylbenzene.
Methane base-----	4,4'-Methylenebis[N,N-dimethylaniline].
Michler's hydrol-----	4,4'-Bis[dimethylamino]benzhydrol.
Michler's ketone-----	4,4'-Bis[dimethylamino]benzophenone.
MOCA-----	3,3'-Dichloro-4,4'-diaminodiphenylmethane
MVP-----	5-Vinyl-2-picoline.
Naphthionic acid-----	4-Amino-1-naphthalenesulfonic acid.
o-Naphthionic acid-----	1-Amino-2-naphthalenesulfonic acid.
β-Naphthol-----	2-Naphthol, tech.
Naphthol AS-----	3-Hydroxy-2-naphthanilide.
α-Naphthylamine-----	1-Naphthylamine.
Neville & Winther's acid-----	4-Hydroxy-1-naphthalenesulfonic acid.
m-Nitrobenzoyl J acid-----	4-Hydroxy-7-(m-nitrobenzamido)-2-naphthalenesulfonic acid.
Oxy Koch's acid-----	1-Naphthol-3,6,8-trisulfonic acid.
Pentaanthrimide-----	1,4,5,8-Tetrakis(1-antraquinonylamino)anthraquinone.
Peri Acid-----	8-Amino-1-naphthalenesulfonic acid.
Phenylbiphenyl-----	Terphenyl.
N-Phenyldiethanolamine-----	2,2'-[(Phenyl)imino]diethanol.
Phenyl Gamma acid-----	6-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl J acid-----	7-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl peri acid-----	8-Anilino-1-naphthalenesulfonic acid.
Picric acid-----	2,4,6-Trinitrophenol.
POPOP-----	1,4-Bis[2-(5-phenyloxazolyl)]benzene.
Pseudocumene-----	1,2,4-Trimethylbenzene.
Pyrazoleanthrone-----	Anthra[1,9-cd]pyrazol-6(2H)-one.
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.
RC Acid (Violet acid)-----	4-Hydroxy-2,7-naphthalenedisulfonic acid.
Rhoduline acid (J Acid Imide)-----	7,7'-Iminobis[4-hydroxy-2-naphthalenesulfonic acid].
RR acid-----	3-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid.
S Acid-----	4-Amino-5-hydroxy-1-naphthalenesulfonic acid.
Schaffer's acid-----	6-Hydroxy-2-naphthalenesulfonic acid.
Silver salt-----	9,10-Dihydro-9,10-dioxo-2-anthracenesulfonic acid and salt.
Solvent Yellow 1-----	p-Phenylazoaniline and hydrochloride.
Solvent Yellow 3-----	4-(o-Tolylazo)-o-toluidine.
SS Acid (Chicago acid)-----	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Sulfanilic acid-----	p-Aminobenzenesulfonic acid.
o-Sulfobenzaldehyde-----	o-Formylbenzenesulfonic acid.

TABLE 3.--CYCLIC INTERMEDIATES: GLOSSARY OF SYNONYMOUS NAMES--CONTINUED

COMMON NAME	STANDARD (CHEMICAL ABSTRACTS) NAME
Tetralin-----	1,2,3,4-Tetrahydronaphthalene.
Thioindoxyl-----	3(2H)-Thianaphthenone.
Thiosalicylic acid-----	o-Mercaptobenzoic acid.
Tobias Acid-----	2-Amino-1-naphthalenesulfonic acid.
TODI-----	Bitolylene diisocyanate.
o-Tolidine-----	3,3'-Dimethylbenzidine.
o-Toluic acid-----	Phenylacetic acid.
o-Tolunitrile-----	Phenylacetonitrile.
4-m-Tolylenediamine-----	Toluene-2,4-diamine.
Trimellitic anhydride-----	1,2,4-Benzenetricarboxylic acid, 1,2-anhydride.
Trimethyl base-----	1,3,3-Trimethyl-2-methyleneindoline.
Trinitrophenol-----	Picric acid.
Urea J Acid (J Acid Urea)-----	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid].
Veratraldehyde-----	3,4-Dimethoxybenzaldehyde
Veratrole-----	o-Dimethoxybenzene.
Vinyltoluene-----	ar-Methylstyrene.
Violet acid (RG Acid)-----	4-Hydroxy-2,7-naphthalenedisulfonic acid.







