

## SODIUM SULFATE

(Data in thousand metric tons, unless otherwise noted)

**Domestic Production and Use:** The domestic natural sodium sulfate industry consisted of two producers operating a total of two plants in California and Texas. Total production of natural and synthetic sodium sulfate increased an estimated 24% compared with that of the 1995. Approximately 44% of total production was a byproduct from facilities that manufacture rayon and various chemicals. The total value of sodium sulfate sold was an estimated \$44 million.

Estimates of U.S. sodium sulfate consumption by end use were soap and detergents, 40%; textiles, 25%; glass, 15%; and paper and miscellaneous, 20%.

<b>Salient Statistics—United States:</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>	<b>1996<sup>e</sup></b>
Production: Natural	337	327	298	327	325
Synthetic <sup>1</sup>	216	210	180	124	195
Imports for consumption	158	163	190	206	175
Exports	155	89	65	66	100
Consumption, apparent (natural and synthetic)	544	616	611	609	595
Price: Quoted, sodium sulfate (100% Na <sub>2</sub> SO <sub>4</sub> ), bulk, f.o.b. works, East, dollars per short ton	114.00	114.00	114.00	114.00	114.00
Average sales value (natural source), f.o.b. mine or plant, dollars per metric ton	91.79	76.53	81.25	84.55	85.00
Stocks, producer, yearend, natural	47	42	34	16	16
Employment, well and plant, number	240	240	240	240	240
Net import reliance <sup>2</sup> as a percent of apparent consumption	E	13	22	26	13

**Recycling:** There was some recycling of sodium sulfate by consumers, particularly in the pulp and paper industry, but no recycling by sodium sulfate producers.

**Import Sources (1992-95):** Canada, 95%; Mexico, 4%; and other, 1%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Most favored nation (MFN) 12/31/96</b>	<b>Non-MFN<sup>3</sup> 12/31/96</b>
Disodium sulfate:			
Saltcake (crude)	2833.11.1000	Free	Free.
Other	2833.11.5000	0.4% ad val.	3.6% ad val.
Anhydrous	2833.11.5010	0.4% ad val.	3.6% ad val.
Other	2833.11.5050	0.4% ad val.	3.6% ad val.

**Depletion Allowance:** 14% (Domestic), 14% (Foreign); for natural only.

**Government Stockpile:** None.

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**Events, Trends, and Issues:** The international demand for powdered laundry detergents continued in 1996, especially in Mexico, Europe, and the Pacific rim. Mexican producers of natural sodium sulfate supplied most of their output to domestic detergent manufacturers, resulting in reduced exports to the United States. This provided the opportunity for U.S. sodium sulfate producers to increase their export sales, because Mexico had been a major supplier to various world markets.

An idled hydrochloric acid facility in Monument, NM, that produced byproduct sodium sulfate resumed operations in October. The plant's new rate of recovery of sodium sulfate was 32,000 tons annually. A new sales and marketing company was formed to sell the sodium sulfate. This company is based in Tulsa, OK, with a sales office in Charlotte, NC.

The outlook for sodium sulfate in 1997 is forecast to be comparable to 1996, with detergents remaining the largest sodium sulfate-consuming sector.

### World Production, Reserves, and Reserve Base:

	Production		Reserves <sup>4</sup>	Reserve base <sup>4</sup>
	1995	1996 <sup>e</sup>		
Natural				
United States	327	325	860,000	1,400,000
Argentina	10	10	NA	NA
Canada	301	300	84,000	270,000
Iran	280	290	NA	NA
Mexico	525	550	170,000	230,000
Spain	600	600	180,000	270,000
Turkey	307	80	100,000	NA
Turkmenistan <sup>5</sup>	45	50	NA	200
Other countries	135	160	100,000	200,000
World total, natural (rounded)	2,500	2,400	<sup>6</sup> 3,300,000	<sup>7</sup> 4,600,000
World total, synthetic (rounded)	1,500	1,600	—	—
World total (rounded)	4,000	4,000	—	—

**World Resources:** Sodium sulfate resources are sufficient to last hundreds of years at the present rate of world consumption. In addition to the countries listed in World Production, the following countries also contain identified resources of sodium sulfate: Botswana, China, Egypt, Italy, Mongolia, Romania, and South Africa. Commercial production from domestic resources is from deposits in California and Texas. The brine in Searles Lake, CA, contains about 450 million metric tons of sodium sulfate resource, representing about 35% of the lake brine. In Utah, about 12% of the dissolved salts in the Great Salt Lake is sodium sulfate, representing about 400 million tons of resource. An irregular, 21-meter-thick mirabilite deposit is associated with clay beds 4.5 to 9.1 meters below the lake bottom near Promontory Point, UT. Several playa lakes in west Texas contain underground sodium sulfate-bearing brines and crystalline material. Other economic and subeconomic deposits of sodium sulfate are near Rhodes Marsh, NV; Grenora, ND; Okanogan County, WA; and Bull Lake, WY. Sodium sulfate can also be obtained as a byproduct from the production of ascorbic acid, boric acid, cellulose, chromium chemicals, lithium carbonate, rayon, resorcinol, and silica pigments. The quantity and availability of byproduct sodium sulfate are dependent on the production capabilities of the primary industries and the sulfate recovery rates.

**Substitutes:** In pulp and paper, emulsified sulfur and caustic soda (sodium hydroxide) can replace sodium sulfate. In detergents, a variety of products can substitute for sodium sulfate. In glassmaking, soda ash and calcium sulfate have been substituted for sodium sulfate with less-than-perfect results.

<sup>e</sup>Estimated. E Net exporter. NA Not available.

<sup>1</sup>Source: Bureau of the Census. Synthetic production data are revised in accordance with recent updated Census statistics.

<sup>2</sup>Defined as imports - exports + adjustments for Government and industry stock changes.

<sup>3</sup>See Appendix B.

<sup>4</sup>See Appendix C for definitions.

<sup>5</sup>Part of the former Soviet Union. Data are inadequate to formulate reliable estimates for individual countries of the former Soviet Union.

<sup>6</sup>Excludes Argentina, Iran, and Turkmenistan. Includes nonproducing nations.

<sup>7</sup>Excludes Argentina, Iran, and Turkey. Includes nonproducing nations.