

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 two plants in California and Texas. Fourteen companies operating 17 plants in 16 States recovered byproduct sodium sulfate from various manufacturing processes or products, including ascorbic acid, battery reclamation, cellulose, rayon, and silica pigments. More than one-half of total output was a byproduct of these plants. The total value of natural and synthetic sodium sulfate sold was an estimated \$60 million. Estimates of U.S. sodium sulfate consumption by end use were soap and detergents, 46%; textiles, 12%; pulp and paper, 13%; glass, 11%; carpet fresheners, 7%; and miscellaneous, 11%.

Salient Statistics—United States:	1997	1998	1999	2000	2001^e
Production, total (natural and synthetic) ¹	640	571	599	491	510
Imports for consumption	150	110	87	73	40
Exports	86	90	137	165	220
Consumption, apparent (natural and synthetic)	697	591	549	399	330
Price, quoted, sodium sulfate (100% Na ₂ SO ₄), bulk, f.o.b. works, East, dollars per short ton	114.00	114.00	114.00	114.00	114.00
Employment, well and plant, number ^e	225	225	225	225	225
Net import reliance ² as a percentage of apparent consumption	9	3	E	E	E

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 (1997-2000): Canada, 95%; Mexico, 4%; and other, 1%.

Tariff:	Item	Number	Normal Trade Relations 12/31/01
	Disodium sulfate:		
	Saltcake (crude)	2833.11.1000	Free.
	Other:	2833.11.5000	0.4% ad val.
	Anhydrous	2833.11.5010	0.4% ad val.
	Other	2833.11.5050	0.4% ad val.

Depletion Allowance: Natural, 14% (Domestic and foreign); synthetic, none.

Government Stockpile: None.

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Events, Trends, and Issues: The closure of byproduct sodium sulfate operations in Mobile, AL, and Monument, NM, and the natural sodium sulfate operation in Inglebright, Saskatchewan, Canada, helped reduce the oversupply situation for sodium sulfate in North America. These three facilities had a combined annual capacity of about 260,000 tons. The tightening of supply and the impact of rising energy costs prompted producers to raise prices in April. Various producers raised prices between \$10 per short ton to \$13 per short ton; some customers who had price-protected contracts were requested to pay an energy surcharge of \$9 per short ton.

Sodium sulfate demand continued to decline in 2001. Although powdered home laundry detergents may contain as much as 50% sodium sulfate in their formulation, the market for liquid detergents, which do not contain any sodium sulfate, continued to grow. Sodium sulfate consumption in the textile industry also has been declining because of imports of less expensive textile products. Declining domestic demand resulted in a decrease in imports, especially from Canada. However, the growth in the detergent and textile sectors in Central America and South America caused U.S. sodium sulfate exports to increase. Exports are expected to continue increasing in the next few years.

The outlook for sodium sulfate in 2002 is expected to be comparable with that of 2001, with detergents remaining the largest sodium sulfate-consuming sector. World production and consumption of sodium sulfate have been stagnant but are expected to grow in the next few years, especially in Asia and South America.

World Production, Reserves, and Reserve Base: Although data on mine production for natural sodium sulfate are not available, total world production of natural sodium sulfate is estimated to be about 4 million tons. Total world production of byproduct sodium sulfate is estimated between 1.5 million and 2.0 million tons.

	Reserves³	Reserve base³
United States	860,000	1,400,000
Canada	84,000	270,000
Mexico	170,000	230,000
Spain	180,000	270,000
Turkey	100,000	NA
Other countries	<u>1,900,000</u>	<u>2,400,000</u>
World total (rounded)	<u>3,300,000</u>	<u>4,600,000</u>

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 above with reserves, 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 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 effective results.

⁰Estimated. E Net exporter. NA Not available.

¹Source: U.S. Census Bureau. Synthetic production data are revised in accordance with recent updated Census statistics.

²Defined as imports - exports + adjustments for Government and industry stock changes (if available).

³See Appendix C for definitions.