

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. Fifteen companies operating 16 plants in 13 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 \$55 million. Estimates of U.S. sodium sulfate consumption by end use were soap and detergents, 46%; pulp and paper, 13%; textiles, 12%; glass, 11%; carpet fresheners, 7%; and miscellaneous, 11%.

Salient Statistics—United States:	1998	1999	2000	2001	2002^e
Production, total (natural and synthetic) ¹	571	599	462	512	500
Imports for consumption	110	87	73	34	40
Exports	90	137	165	191	100
Consumption, apparent (natural and synthetic)	591	549	370	355	440
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 percent of apparent consumption	3	E	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 (1998-2001): Canada, 95%; Mexico, 4%; and other, 1%.

Tariff:	Item	Number	Normal Trade Relations 12/31/02
	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 first pair of evaporation ponds to produce sodium sulfate with coproduct iodine at Aguas Blancas, Chile, went into operation at midyear. The initial phase of the project was scheduled to produce 50,000 tons annually with full production targeted for 300,000 tons per year. When in full operation, the facility will be the largest sodium sulfate producer in South America.

Domestic sodium sulfate demand continued to decline in 2002. 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 imports of less expensive textile products have won a greater share of the domestic market. Declining domestic demand in the past several years resulted in a decrease of sodium sulfate imports, especially from Canada. However, growth in powdered home laundry detergents abroad (approximately 80% of world sodium sulfate consumption is for detergents) and the expanding 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 2003 is expected to be comparable with that of 2002, with detergents remaining the largest sodium sulfate-consuming sector. If the winter of 2002–03 is relatively mild, byproduct recovery of sodium sulfate from automobile batteries may decline because fewer battery failures during mild winter weather reduces recycling. 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 to be between 1.5 million and 2.0 million tons.

	Reserves ³	Reserve base ³
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	3,300,000	4,600,000

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 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's 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.