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 5% compared with that of the 1996. Approximately 45% of total production was a byproduct from facilities that manufacture rayon and various chemicals. The total value of sodium sulfate sold was an estimated $58 million.

Estimates of U.S. sodium sulfate consumption by end use were soap and detergents, 42%; textiles, 15%; pulp and paper, 12%; glass, 11%; and miscellaneous, 20%.

Production: Natural  327  298  327  306  320
  Synthetic 1  210  293  318  246  260
  Total  537  591  645  551  580
Imports for consumption  163  190  206  177  160
Exports  89  65  66  86  80
Consumption, apparent (natural and synthetic)  616  724  803  639  659
Price: Quoted, sodium sulfate (100% Na₂SO₄), 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  76.53  81.25  84.55  88.90  90.00
Stocks, producer, yearend, natural  42  34  16  19  20
Employment, well and plant, number  240  240  240  240  240
Net import reliance as a percent of apparent consumption  13  18  17  14  12

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 (1993-96): Canada, 95%; Mexico, 4%; and other, 1%.

Tariff: Item Number Most favored nation (MFN) Non-MFN
  12/31/97  12/31/97
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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SODIUM SULFATE

Events, Trends, and Issues: The domestic sodium sulfate market remained strong in 1997 as sales to the detergent and textile sectors increased. Sodium sulfate producers situated closer to port facilities took advantage of their strategic location to cater to the export market while inland producers increased product sales to domestic customers. Foreign growth continued in sodium sulfate consumption, especially in Mexico, resulting in a decision by the Mexican sodium sulfate producer to increase capacity by 20%.

A synthetic sodium sulfate demand manufacturer in North Carolina completed its project in June to modify its processing technology to recover high-purity, detergent-grade sodium sulfate. The company anticipated selling material to interested detergent customers beginning in 1998.

The outlook for sodium sulfate in 1998 is forecast to be slightly higher than that estimated for 1997, with detergents remaining the largest sodium sulfate-consuming sector. World production and consumption of sodium sulfate is expected to grow in the next few years, especially in Asia and South America.

World Production, Reserves, and Reserve Base:

<table>
<thead>
<tr>
<th>Natural:</th>
<th>Production 1996</th>
<th>Production 1997</th>
<th>Reserves a</th>
<th>Reserve base a</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>306</td>
<td>320</td>
<td>860,000</td>
<td>1,400,000</td>
</tr>
<tr>
<td>Argentina</td>
<td>10</td>
<td>10</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Canada</td>
<td>315</td>
<td>300</td>
<td>84,000</td>
<td>270,000</td>
</tr>
<tr>
<td>China</td>
<td>650</td>
<td>650</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Iran</td>
<td>280</td>
<td>280</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Mexico</td>
<td>525</td>
<td>550</td>
<td>170,000</td>
<td>230,000</td>
</tr>
<tr>
<td>Spain</td>
<td>650</td>
<td>650</td>
<td>180,000</td>
<td>270,000</td>
</tr>
<tr>
<td>Turkey</td>
<td>300</td>
<td>300</td>
<td>100,000</td>
<td>NA</td>
</tr>
<tr>
<td>Turkmenistan b</td>
<td>100</td>
<td>50</td>
<td>NA</td>
<td>200</td>
</tr>
<tr>
<td>Other countries</td>
<td>104</td>
<td>160</td>
<td>100,000</td>
<td>200,000</td>
</tr>
<tr>
<td>World total, natural (rounded)</td>
<td>3,200</td>
<td>3,300</td>
<td>3,300,000</td>
<td>4,600,000</td>
</tr>
<tr>
<td>World total, synthetic (rounded)</td>
<td>1,700</td>
<td>1,800</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>World total (rounded)</td>
<td>4,900</td>
<td>5,100</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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.

*Estimated. NA Not available.
1Source: Bureau of the Census. Synthetic production data are revised in accordance with recent updated Census statistics.
2Defined as imports - exports + adjustments for Government and industry stock changes.
3See Appendix B.
4See Appendix D for definitions.
5Part of the Former Soviet Union. Data are inadequate to formulate reliable estimates for individual countries of the Former Soviet Union.
6Excludes Argentina, Iran, and Turkmenistan. Includes nonproducing nations.
7Excludes Argentina, Iran, and Turkey. Includes nonproducing nations.