IODINE
(Data in metric tons elemental iodine unless otherwise noted)

Domestic Production and Use: Iodine was produced from brines in 2014 by two companies operating in Oklahoma, and one company operating in Kentucky, Montana, Oklahoma, and Texas. Production in 2014 was estimated to have increased from that of 2013. To avoid disclosing company proprietary data, U.S. iodine production in 2014 was withheld. Prices for iodine have continued to decline in 2014 owing to the surplus of iodine in the market. The average cost, insurance, and freight value of iodine imports in 2014 was estimated to be $39.00 per kilogram.

Domestic and imported iodine were used by downstream manufacturers to produce many intermediate iodine compounds, making it difficult to establish an accurate end-use pattern. Of the consumers that participate in an annual U.S. Geological Survey canvass, 12 plants reported consumption of iodine in 2013. Iodine and iodine compounds reported were ethyl and methyl iodide, 49%; potassium iodide, 16%; povidine-iodine, 5%; crude iodine, ethylenediamine dihydroiodide, and hydriodic acid, 4% each; potassium iodate, resublimed iodine, sodium iodide, 1% each; and other inorganic compounds, 15%.

Salient Statistics—United States: 2010 2011 2012 2013 2014*
Production
Imports for consumption, crude content 5,710 6,590 5,960 5,960 5,340
Exports 1,070 900 1,040 1,150 1,010
Consumption:
Apparent W W W W W
Reported 4,640 4,740 4,880 4,020 3,980
Price, average c.i.f. value, dollars per kilogram, crude 24.39 38.13 41.97 42.51 38.44
Employment, number e 30 30 30 30 40
Net import reliance* as a percentage of reported consumption 100 100 100 100 100

Recycling: Small amounts of iodine were recycled, but no data were reported.

Import Sources (2010–13): Chile, 87%; Japan, 12%; and other, 1%.

Tariff: Item Number Normal Trade Relations 12–31–14
Iodine, crude 2801.20.0000 Free.
Iodide, calcium or copper 2827.60.1000 Free.
Iodide, potassium 2827.60.2000 2.8% ad val.
Iodides and iodide oxides, other 2827.60.5100 4.2% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

Prepared by Désirée E. Polyak [(703) 648–4909, dployak@usgs.gov]
 Events, Trends, and Issues: The 2014 iodine price decreased from the historically high levels of 2012 and early 2013. Iodine prices steadily declined throughout 2014. Spot prices of iodine crystal, according to Industrial Minerals, averaged around $50 per kilogram at the beginning of 2014 and decreased continuously to an average of around $37 per kilogram in September 2014. According to industry sources, the decline in prices was attributed to the decrease in demand from downstream specialty chemical consumers combined with a faster than anticipated ramp up of production by suppliers in Chile. Owing to the price decreases, some producers, most notably in Chile, have announced temporary reduction of iodine production.

As in recent years, Chile was the world’s leading producer of iodine, followed by Japan and the United States. Chile accounted for more than 66% of world production in 2014, having two of the leading iodine producers in the world. The Chilean producers were operating close to capacity and were expected to adjust production in response to changes in demand.

World Mine Production and Reserves:

<table>
<thead>
<tr>
<th>Country</th>
<th>Mine production 2013</th>
<th>Mine production 2014</th>
<th>Reserves 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>W</td>
<td>W</td>
<td>250,000</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>350</td>
<td>350</td>
<td>170,000</td>
</tr>
<tr>
<td>Chile</td>
<td>20,700</td>
<td>21,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td>China</td>
<td>NA</td>
<td>NA</td>
<td>4,000</td>
</tr>
<tr>
<td>Indonesia</td>
<td>75</td>
<td>75</td>
<td>100,000</td>
</tr>
<tr>
<td>Japan</td>
<td>9,500</td>
<td>9,500</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Russia</td>
<td>200</td>
<td>200</td>
<td>120,000</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>500</td>
<td>500</td>
<td>70,000</td>
</tr>
<tr>
<td>World total (rounded)</td>
<td>31,300</td>
<td>31,600</td>
<td>7,500,000</td>
</tr>
</tbody>
</table>

World Resources: In addition to the reserves shown above, seawater contains 0.06 parts per million iodine, or approximately 90 billion tons. Seaweeds of the Laminaria family are able to extract and accumulate up to 0.45% iodine on a dry basis. Although not as economical as the production of iodine as a byproduct of gas, nitrate, and oil, the seaweed industry represented a major source of iodine prior to 1959 and remains a large resource.

Substitutes: No comparable substitutes exist for iodine in many of its principal applications, such as in animal feed, catalytic, nutritional, pharmaceutical, and photographic uses. Bromine and chlorine could be substituted for iodine in biocide, colorant, and ink, although they are usually considered less desirable than iodine. Antibiotics can be used as a substitute for iodine biocides.