

RUBIDIUM

(Data in kilograms of rubidium content, unless otherwise noted)

Domestic Production and Use: Rubidium is not mined in the United States, and only a small number of U.S. companies process imported rubidium ore. Small amounts of rubidium and its compounds are used for inorganic chemicals, as standards for atomic absorption analytical techniques, in gas-type vapor cells, DNA separation, fiber optics, night vision devices, and lamps. Both rubidium and cesium are used in atomic clocks. Rubidium is important in geochronology, and rubidium-82 (a decay product of strontium-82) is used in imaging technology in the diagnosis of heart conditions.

Salient Statistics—United States: Data on production of rubidium from Canada, the major source of U.S. supplies, are proprietary; consumption, import, and export data are not available. The U.S. rubidium market is small, and annual consumption amounts to only a few thousand kilograms. The metal is not traded and, therefore, no market price is available. Prices for rubidium and rubidium compounds have remained stable. In 2003, 1-gram ampoules of 99.75%-grade rubidium metal were offered at \$54.10, and the price for 100 grams of the same material was \$1,038.00.

Recycling: None.

Import Sources (1999-2002): The United States is 100% import reliant. Canada is the chief source of rubidium ore imported by the United States.

Tariff: Item	Number	Normal Trade Relations
Alkali metals, other	2805.19.9000	<u>12/31/03</u> 5.5% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

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Events, Trends, and Issues: Use and consumption of rubidium and rubidium compounds are not commercially significant nor are environmental or human health issues associated with use or processing of the metal. Present technology does not indicate a potentially new rubidium market nor is a change in use patterns predicted.

World Mine Production, Reserves, and Reserve Base: Canada is the world's leading producer of rubidium, which is found in trace amounts in some potassium-bearing minerals such as micas and feldspars that form during the crystallization of pegmatites. These exceptionally coarse-grained rocks formed late in the crystallization of granitic magma and may have concentrations of unusual and rare elements. Lepidolite is a potassium-lithium mica that may contain up to 3.15% rubidium and is the principal ore of rubidium. Rubidium may also be obtained as a byproduct from pollucite, a cesium aluminosilicate mineral that may contain up to 1.35% rubidium. There are, however, no minerals in which rubidium is the predominant metallic element. Rubidium has also been reported in brines in northern Chile and in China and also in salt beds in Germany, France, and New Mexico.

World Resources: There are pegmatite occurrences in Maine and South Dakota in which rubidium may be present in minor amounts in lepidolite. Lepidolite, which is also an important source of lithium, may occur with pollucite, the ore mineral of cesium, in zoned pegmatites. These minerals are mined chiefly in Canada; however, there are pegmatite occurrences in Afghanistan, Namibia, Zambia and other countries. World resources of rubidium are unknown, but supplies of lepidolite are adequate for current use patterns.

Substitutes: The properties of rubidium and its compounds are similar to those of cesium and its compounds. Therefore, rubidium and cesium may be used interchangeably in atomic clocks and other applications; however, cesium is less expensive.