

RUBIDIUM

(Data in kilograms of rubidium content unless otherwise noted)

Domestic Production and Use: Rubidium may occur with the cesium or lithium minerals, pollucite or lepidolite, respectively, in zoned pegmatites. There are such rubidium occurrences in Maine and South Dakota, and with some evaporite minerals in other States; however, rubidium is not mined in the United States. Rubidium concentrate is imported from Canada for processing in the United States. Overall, uses for rubidium and its compounds are limited; however, applications include DNA separation, fiber optics, inorganic chemicals, lamps, night vision devices, and as standards for atomic absorption analysis. High-purity rubidium (>98%) is used in vapor cells as a wavelength reference. Atomic clocks mainly use cesium as a frequency standard; however, rubidium may also be substituted. Rubidium-82 is used clinically as a tracer of blood flow in the heart. Rubidium-87, a natural decay product of strontium-82, which may be extracted from potassium-bearing minerals such as micas, is used for dating episodes of heating and deformation in rocks.

Salient Statistics—United States: Rubidium imported into the United States is produced as a byproduct from one mine in Canada. Production data are not available, and similarly, U.S. consumption, export, and import data are not available. In the United States, consumption of rubidium is small and may amount to only a few thousand kilograms per year. Rubidium is not traded; therefore, no market price is available. In 2006, one company offered 1-gram ampoules of 99.75%-grade rubidium (metals basis) at \$58.20 each, and the price for 100 grams of the same material was \$1,118.00.

Recycling: None.

Import Sources (2002-05): Canada is the source of rubidium ore imported by the United States, and the United States is 100% import reliant.

<u>Tariff:</u>	<u>Item</u>	<u>Number</u>	<u>Normal Trade Relations</u>
			<u>12-31-06</u>
	Alkali metals, other	2805.19.9000	5.5% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

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Events, Trends, and Issues: Coal combustion may release small amounts of rubidium to the atmosphere; however, there have been no adverse environmental or human health issues associated with the processing or use of rubidium. Consumption of rubidium and its compounds is not commercially significant, and no change in use patterns is anticipated. Because of the environmental concern for mercury releases from lamps, rubidium halide cathodes are being researched as substitutes for use in low-pressure, mercury-free lamps.

World Mine Production, Reserves, and Reserve Base:¹ During the crystallization of pegmatites, rubidium may be taken up in trace amounts in the lattices of potassium feldspars and micas. The chief rubidium minerals, lepidolite and pollucite, may be found in some zoned pegmatites, which are exceptionally coarse-grained igneous rocks that form late in the crystallization of a silicic magma. Lepidolite, which is a lithium-bearing mica, is the principal ore mineral of rubidium and may contain up to 3.15% rubidium. Pollucite, which is a cesium aluminosilicate mineral, may contain up to 1.35% rubidium. There are no minerals in which rubidium is the predominant metallic element. Canada is the world's leading producer of rubidium, and supplies of rubidium-bearing lepidolite from Canada are adequate for current use patterns.

World Resources: World resources of rubidium are unknown. Rubidium-bearing pegmatites are found in several locations in Canada, and there are also pegmatite occurrences in Afghanistan, Namibia, Peru, Zambia, and other countries. Brines in northern Chile and China have minor amounts of rubidium. Evaporites in France, Germany, and the United States (New Mexico and Utah) are reported to contain rubidium.

Substitutes: Rubidium and cesium are close together on the Periodic Table, have similar atomic radii, and, therefore, have similar physical properties. These metals may be used interchangeably in most applications.

¹[See Appendix C for definitions.](#)