

## RUBIDIUM

(Data in kilograms of rubidium content unless otherwise noted)

**Domestic Production and Use:** Rubidium is not mined in the United States; however, occurrences are known in Maine and South Dakota, and rubidium is associated with some evaporite mineral occurrences in other States. Rubidium concentrate is imported from Canada for processing in the United States. Applications for rubidium and its compounds include biomedical research, electronics, specialty glass, and pyrotechnics. Biomedical applications include rubidium salts used in the treatment of epilepsy and rubidium-82 used as a blood-flow tracer. Rubidium is used as an atomic resonance frequency standard in atomic clocks, playing a vital role in global positioning systems (GPS). Rubidium-rich feldspars are used in ceramic applications for spark plugs and electrical insulators because of their high-dielectric capacity.

**Salient Statistics—United States:** U.S. salient statistics, such as consumption, exports, and imports, are not available. U.S. rubidium consumption was small and may amount to only a few thousand kilograms per year. One mine in Canada produced rubidium ore, which was converted to byproduct concentrate; however, production data for that mine are not available. Part of that concentrate was exported to the United States for further processing. There is no market price for rubidium because the metal is not traded. In 2011, one company offered 1-gram ampoules of 99.75%-grade rubidium (metal basis) for \$72.10 each, a 3% increase from that of 2010. The price for 100 grams of the same material was \$1,321.00, a 2.0% increase from that of 2010.

**Recycling:** None.

**Import Sources (2007–10):** The United States is 100% import reliant on byproduct rubidium concentrate imported from Canada.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations</b>
			<b><u>12-31-11</u></b>
	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:** Rubidium has been commercially available as a byproduct of lithium chemicals production for 40 years. The use of rubidium was primarily in chemical and electronics research. The use of rubidium in atomic clocks continues to increase. Advances have been made in the use of rubidium in atomic circuit technology for quantum computing. Rubidium atoms are used to create quantum gates that transfer information in atomic circuits. The use of rubidium-82 positron emission tomography (PET) combined with computed tomography angiography (CTA) in the evaluation and care of patients with suspected coronary artery disease continues to increase. Research in the use of rubidium in superconductors is increasing.

**World Mine Production and Reserves:**<sup>1</sup> There are no minerals in which rubidium is the predominant metallic element; however, rubidium may be taken up in trace amounts in the lattices of potassium feldspars and micas during the crystallization of pegmatites. The rubidium-bearing minerals lepidolite and pollucite may be found in zoned pegmatites, which are exceptionally coarse-grained plutonic rocks that form late in the crystallization of a silicic magma. Lepidolite, the principal source of rubidium, can contain up to 3.5% rubidium oxide, and pollucite contains up to 1.5% rubidium oxide.

**World Resources:** World resources of rubidium are unknown. In addition to several significant rubidium-bearing zoned pegmatites in Canada, there are pegmatite occurrences in Afghanistan, Namibia, Peru, Russia, and Zambia. Minor amounts of rubidium are reported in brines in northern Chile and China and in evaporites in France, Germany, and the United States (New Mexico and Utah).

**Substitutes:** Rubidium and cesium have similar physical properties and may be used interchangeably in many applications; however, cesium is a preferred material in many applications because it is more electropositive than rubidium.

<sup>1</sup>[See Appendix C for resource/reserve definitions and information concerning data sources.](#)