CESIUM

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

Domestic Production and Use: Cesium is not mined in the United States; however, there are cesium occurrences in South Dakota and Maine. One U.S. company imports pollucite, the principal ore of cesium, from Canada to produce specialty, high-density drilling fluids for use in the global oil and gas exploration industry. Cesium is also used in photoelectric cells, traffic controls, infrared detectors, DNA separation, and night vision devices; it may have applications in the aerospace industry as a rocket fuel. At the U.S. Naval Observatory, cesium is used in atomic clocks that are accurate to a few hundred trillionths of a second. Internet and cell phone transmissions rely on the accuracy of cesium atomic clocks; military missiles, global positioning satellites, and jet aircraft that track the returning U.S. space shuttles are synchronized using cesium clocks. Cesium-137, which is a reactor-produced radioactive isotope of cesium, is used for cancer treatment, in industrial gauges, and for sterilization of food, sewage, and surgical equipment.

Salient Statistics—United States: Data on cesium production, consumption, imports, and exports are not available. World mine production and U.S. consumption data have not been available since the late 1980s. The cesium market is small and annual consumption amounts to a few thousand kilograms. As a result, there is no trading of the metal, and, therefore, no official market price. Several companies publish their prices for cesium and cesium compounds, and these prices have remained relatively stable for several years. In 2003, one company offered 1-gram ampoules of 99.8% (metals basis) cesium for $39.50 and 99.98% (metals basis) cesium for $52.00. The price for 100 grams of 99.8% (metals basis) cesium was $1,038.00, and the same quantity of 99.98% (metals basis) cesium was priced at $1,425.00.

Recycling: None.

Import Sources (1999-2002): The United States is 100% import reliant; Canada is the major source of the cesium ore, pollucite, imported by the United States.

Tariff: Item	Number	Normal Trade Relations 12/31/03
Alkali metals, other	2805.19.9000	5.5% ad val.
Chlorides, other	2827.39.5000	3.7% ad val.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: None.

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CESIUM

Events, Trends, and Issues: The United States will continue to depend on foreign sources of cesium, primarily Canada, unless the cesium market changes enough to make domestic deposits economic or if technology that uses low-grade raw materials is developed. Applications for cesium are limited by its high cost and extreme reactivity. Cesium drilling muds, which are used in the petroleum industry, are readily biodegradable and have minimal environmental impact. No other environmental or human health issues have been associated with stable cesium.

World Mine Production, Reserves, and Reserve Base: Data on mine production of cesium are not available, and data on resources are limited. Estimates of reserves and reserve base are based on occurrences of pollucite, the cesium-bearing aluminosilicate mineral that is found in some zoned pegmatites in association with the lithium minerals lepidolite and petalite. Pollucite is mined as a byproduct with other pegmatite minerals; commercial concentrates of pollucite may contain about 20% cesium by weight.

	Reserves[1]	Reserve base[1]
Canada	70,000,000	73,000,000
Namibia	—	9,000,000
Zimbabwe	—	23,000,000
Other countries	NA	NA
World total (rounded)	70,000,000	110,000,000

World Resources: World resources of cesium have not been estimated. Cesium may be associated with pegmatites worldwide; cesium resources have been found in pegmatites in Namibia and Zimbabwe. Cesium occurrences are also known in brines in Chile and China and in geothermal systems in Germany, India, and Tibet.

Substitutes: The properties of rubidium and its compounds are similar to those of cesium and its compounds; thus, they may be used interchangeably in many applications.

NA Not available. — Zero.
[1]See Appendix C for definitions.