CESIUM

(Data in metric tons, cesium oxide, unless otherwise specified)

Domestic Production and Use: In 2025, no cesium was mined domestically, and the United States was 100% net import reliant for cesium minerals. Pollucite, mainly found in association with lithium-rich, lepidolite-bearing or petalite-bearing zoned granite pegmatites, is the principal cesium ore mineral. Cesium is used in relatively small-scale applications, using only a few grams for most applications. Owing to the lack of global availability of cesium, many applications have used mineral substitutes and the use of primary cesium in any particular application may no longer be viable. On the basis of consumption by quantity in end-use products, cesium carbonate and hydroxide are the leading cesium products consumed globally, followed by cesium formate, cesium iodide, cesium nitrate, and cesium chloride.

Cesium catalysts, such as cesium carbonate and cesium hydroxide, are used largely in industrial processes. Cesium catalysts have largely replaced potassium promoters in high-purity sulfuric acid manufacturing, which may enable lower plant stack emissions and lower ignition temperatures. Additionally, cesium catalysts are primarily used in methyl methacrylate manufacturing in place of conventional cyanide-based processes and are necessary to improve efficiency, lower operating costs, and reduce environmental impacts. Sulfuric acid catalysts and methyl methacrylate may be used in aerospace, automotive, and manufacturing applications. Cesium formate brines are used for high-pressure, high-temperature well drilling for oil and gas exploration and production. Cesium iodide is used primarily in X-ray panel production.

Cesium bromide may be used in infrared detectors, optics, photoelectric cells, scintillation counters, and spectrophotometers. Cesium carbonate may be used in the alkylation of organic compounds and in energy conversion devices, such as fuel cells, magneto-hydrodynamic generators, and polymer solar cells. Cesium chloride may be used in analytical chemistry applications as a reagent, in high-temperature solders, as an intermediate in cesium metal production, in isopycnic centrifugation, as a radioisotope in nuclear medicine, as an insect repellent in agricultural applications, and in specialty glasses. Cesium hydroxide may be used as an electrolyte in alkaline storage batteries. Cesium iodide may be used in fluoroscopy equipment as the input phosphor of X-ray image intensifier tubes, and in scintillators. Cesium metal may be used in the production of cesium compounds and photoelectric cells. Cesium nitrate may be used as a colorant and oxidizer in the pyrotechnic industry, in petroleum cracking, in scintillation counters, and in X-ray phosphors. Cesium sulfates may be used in water treatment, fuel cells, and to improve optical quality for scientific instruments.

Cesium isotopes, which are obtained as a byproduct in nuclear fission or formed from other isotopes, may be used in electronic, medical, metallurgical, and research applications. Cesium isotopes are used as an atomic resonance frequency standard in atomic clocks, playing a vital role in aircraft guidance systems, global positioning satellites, and internet and cellular telephone transmissions. Cesium-131 was used in medical products for treatment of various cancers. Cesium-137 may be used in industrial gauges, in mining and geophysical instruments, and for sterilization of food, sewage, and surgical equipment. Because of the danger posed by the radiological properties of cesium-137, Congress set a goal for the National Nuclear Security Administration to eliminate cesium-137 blood irradiators by 2027 in the United States. Alternatives, including X-ray irradiators, have been developed with similar capabilities and have been partially implemented.

Salient Statistics—United States: Consumption, import, and export data for cesium have not been available since the late 1980s. Because cesium metal is not traded in commercial quantities, a market price is unavailable. It is estimated that no more than a few thousand kilograms of cesium chemicals are consumed in the United States every year. The United States was 100% net import reliant for its cesium needs, and the primary global producers were estimated to include Canada, China, Germany, and Russia.

In 2025, one company offered 1-gram ampoules of 99.8% (metal basis) cesium for $104.00, a 6% increase from $98.00 in 2024, and 99.98% (metal basis) cesium for $132.00, a 6% increase from $124 in 2024. At the end of September 2025, the prices for 50 grams of 99.9% (metal basis) cesium acetate, cesium bromide, cesium carbonate, cesium chloride, and cesium iodide were $161.20, $111.00, $146.40, $166.00, and $185.80, respectively, with increases ranging from 7% to 8% compared with prices in 2024. The price for a cesium-plasma standard solution (10,000 micrograms per milliliter) in 2025 was $102.00 for 50 milliliters and $155.00 for 100 milliliters, increases of 9% from $93.40 and $142.00 in 2024, respectively. The price for 25 grams of 98% (metal basis) cesium formate was $56.10, a 7% increase from $52.40 in 2024.

Recycling: Cesium formate brines are typically rented by oil and gas exploration clients. After completion of the well, the used cesium formate brine is returned and reprocessed for subsequent drilling operations. Cesium formate brines are recycled, recovering nearly 85% of the brines for recycling to be reprocessed for further use. Cesium iodide is recycled from radiography panels and used in the production of new panels.

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Import Sources (2021–24): No reliable data have been available to determine the source of cesium ore imported by the United States since 1988. Prior to 2016, Canada was estimated to be the primary supplier of cesium ore and refined chemicals. Based on recent import data, it was estimated that China and Germany were sources of cesium chemicals.

Tariff: Item	Number	Normal Trade Relations 12–31–25
Alkali metals, other	2805.19.9000	5.5% ad valorem.
Chlorides, other	2827.39.9000	3.7% ad valorem.
Bromides, other	2827.59.5100	3.6% ad valorem.
Iodides, other	2827.60.5100	4.2% ad valorem.
Sulfates, other	2833.29.5100	3.7% ad valorem.
Nitrates, other	2834.29.5100	3.5% ad valorem.
Carbonates, other	2836.99.5000	3.7% ad valorem.

Depletion Allowance: 14% (domestic and foreign).

Government Stockpile: None.

Events, Trends, and Issues: Domestic cesium occurrences will likely remain subeconomic unless market conditions change. No known human health issues are associated with exposure to naturally occurring cesium, and its use has minimal environmental impacts. Manufactured radioactive isotopes of cesium have been known to cause adverse health effects. Certain cesium compounds may be toxic if consumed. Food that has been irradiated using the radioisotope cesium-137 has been found to be safe by the U.S. Food and Drug Administration.

During 2025, one company in Canada reported intermittent cesium production and processing from mined ore and stockpiles at the Tanco Mine. The recovery and processing of cesium from tailings at the Bikita Mine in Zimbabwe for shipment to China was restarted in recent years. Throughout 2025, multiple projects that could produce cesium as a byproduct of lepidolite, pollucite, spodumene, or zinnwaldite mining, focused primarily on lithium or rubidium extraction, were in the exploration and feasibility stages in Canada, Laos, Namibia, and the United States. One company that was developing a lepidolite (hard-rock) mine and processing facility in Namibia brought in an independent administrator owing to the lack of project financing at the end of 2024. Another company was in the process of securing financing to take ownership of the project as of September 2025. Based on historical information, the Namibia project contained a Joint Ore Reserves Committee-compliant measured and indicated mineral resource estimate totaling 3,100 tons of cesium.

One company developed a recycling program for X-ray panels in 2020 that recovered cesium iodide during the production process for reproduction into new panels, which was believed to now be the industry standard.

World Mine Production and Reserves:[1] There were no official sources for cesium production data. Cesium reserves are estimated based on the occurrence of pollucite, a primary cesium mineral. Most pollucite contains 5% to 32% cesium oxide. No reliable data were available to determine reserves for specific countries; however, Australia, Canada, China, and Namibia were estimated to have reserves totaling less than 200,000 tons. An estimated 11,000 tons of cesium formate were in use, with 5% being depleted and replaced per year.

World Resources:[1] Cesium is associated with lithium-bearing pegmatites worldwide, and cesium resources have been identified in Australia, Canada, Namibia, the United States, and Zimbabwe. In the United States, pollucite occurs in pegmatites in Alaska, Maine, and South Dakota. Lower concentrations occur in brines in Chile and China and in geothermal systems in China, Germany, and India. China was estimated to have cesium-rich deposits of geyserite, lepidolite, and pollucite, with concentrations highest in Yichun, Jiangxi Province, although no resource, reserve, or production estimates were available. Cesium-bearing clays have been identified in Laos and in situ extraction was being researched.

Substitutes: Cesium and rubidium can be used interchangeably in many applications because they have similar physical properties and atomic radii. Cesium, however, is more electropositive than rubidium, making it a preferred material for some applications. Rubidium is mined from similar deposits in smaller quantities as a byproduct of cesium production in pegmatites and as a byproduct of lithium production from lepidolite mining and processing, making it no more readily available than cesium.

[1]See Appendix C for resource and reserve definitions and information concerning data sources.