Terbium Encyclopedia Article

Terbium

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Terbium

Terbium is a rare earth element, one of the elements found in Row 6 of the **periodic table**. Its **atomic number** is 65, its atomic **mass** is 158.9254, and its chemical symbol is Tb.

Properties

Terbium is a silvery gray metal soft enough to be cut with a knife. Its melting point is 2,473°F (1,356°C), its **boiling point** is about 5,070°F (2,800°C), and its **density** is 8.332 grams per cubic centimeter. The element is not very reactive chemically, although it does dissolve in most acids.

Occurrence and Extraction

Terbium is one of the rarest of the **rare earth elements**, ranking about 55th among the elements found in the Earth's crust. It is found with other rare earth elements in minerals such as monazite, cerite, gadolinite, xenotime, and euxenite. It can be produced by converting its ores first to terbium fluoride (TbF_3), and then electrolyzing the molten terbium fluoride: $2TbF_3$ $2Tb + 3F_2$ or by reacting the terbium fluoride with **calcium** metal: $3Ca + 2TbF_3$ $2Tb + 3CaF_2$

Discovery and Naming

Credit for the discovery of terbium is usually given to the Swedish chemist Carl Gustav Mosander. Mosander spent many years analyzing an unusual black rock found in 1787 near the town of Ytterby, Sweden, by a lieutenant in the Swedish army named Carl Axel Arrhenius (1757-1824). The rock proved to be a fruitful source of new elements, nine being discovered in it over the next century. Mosander identified one of those new elements in 1843 and suggested the name terbium for it in honor of the town of Ytterby.

Uses

Terbium has relatively few commercial uses, the most important of which is as a phosphor in cathode ray tubes, such as those used in television screens. Terbium compounds produce a green light when bombarded by electrons in such tubes. Terbium is also beginning to find some small use in fuel cells designed to operate at very high temperatures.