Germanium Encyclopedia Article

Germanium

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Germanium

Germanium is the third element in Group 14 of the **periodic table**, a group of elements sometimes known as the **carbon** family. Germanium has an **atomic number** of 32, an atomic **mass** of 72.59, and a chemical symbol of Ge.

Properties

Germanium looks like a metal, with a bright, shiny, silvery luster, but it is brittle and breaks apart rather easily. Since it has properties of both a metal and a **nonmetal**, it is generally classified as a **metalloid**. Germanium's melting point is 1,719°F (937.4°C), a **boiling point** of 5,126°F (2,830°C), and a **density** of 5.323 grams per cubic centimeter. Germanium is a relatively inactive element that does not react with **oxygen** at room **temperature**, but will react with hot acids and oxygen at high temperatures.

Occurrence and Extraction

The abundance of germanium in the Earth's crust is estimated to be about 7 parts per million, making it a relatively uncommon element. The element usually occurs in conjunction with ores of **zinc**, although the mineral germanite contains about 8% of the element. Important producers of the element are China, the United Kingdom, Ukraine, Russia, and Belgium.

Discovery and Naming

The existence of an element with atomic number 32 was predicted by the Russian chemist Dmitri Mendeleev in the 1860s. When Mendeleev drew the first periodic table of the elements, he found an empty place below **silicon** and above **tin** in the chart. He not only predicted that an element would be found to fill that spot, but also predicted the properties of that element. In 1885, the German chemist Clemens Alexander Winkler (1838-1904) discovered an element whose atomic number is 32 and whose properties match those predicted by Mendeleev. Winkler proposed the name germanium for the element in honor of his homeland, Germany

Uses

Nearly half of the germanium produced in the United States is used in the manufacture of optical fibers for communication systems. Some germanium is also used to make **semiconductors**, catalysts, and specialized **glass** for military weapon-sighting systems.