Americium Encyclopedia Article

Americium

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Americium

Americium is a transuranium element, one of the elements that lies beyond **uranium** in the **periodic table**. Its **atomic number** is 92, and the **mass** of its most stable **isotope** is 243. Its chemical symbol is Am.

Occurrence and Extraction

Americium does not occur in nature. It is produced artificially in **nuclear reactors**. The first step in the preparation of americium is the manufacture of **plutonium** by the bombardment of uranium-238 with neutrons. Plutonium then decays to produce americium.

Properties

Americium is a silvery white metal with a melting point of about 2,150°F (1,175°C) and a **density** of about 13.6 grams per cubic centimeter. All of its isotopes are radioactive. The half life of the most stable isotope, americium-243, is 7,380 years.

Discovery and Naming

Americium was discovered as a byproduct of military research during World War II. At that time, the U.S. government maintained a major research center at the University of Chicago for the purpose of developing the materials and technology needed to build the first fusion ("atomic") bomb.

During this research, a team of scientists from the University of California discovered a new element. The team consisted of Glenn Seaborg, **Albert Ghiorso**, Ralph A. James, and Leon O. Morgan (1919-). The team decided to name the element americium. They chose the name for two reasons. First, it was intended to honor the United States of America, where it was discovered. Second, its location in the periodic table places it just below element 63, **europium**, which was named for the continent of Europe.

Uses

The only important commercial use of americum is in smoke detectors. In a smoke detector, americium gives off a weak form of radiation that travels across the smoke detector and connects with an electrical circuit. As long as the smoke detector is empty, there is no break in the connection. If smoke enters the detector, however, the radiation can no longer travel across the detector. The connection is broken and a signal is set off. The signal may be a flashing light, a buzzer, or some other sound.