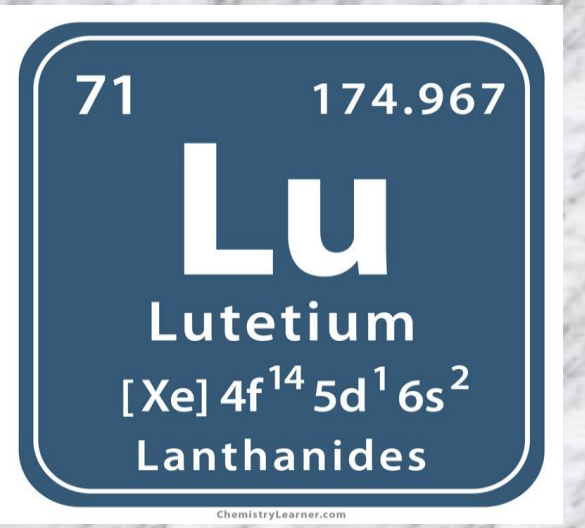
Chemistry Summer Holiday Homework

ELEMENTOPEDIA

Lutetium



Discovery and Naming

*Lutetium was independently discovered in **1907** by French scientist **Georges Urbain,** Austrian Mineralogist **Baron Carl Auer von Welsbach** and American chemist **Charles James**. All of these researchers found lutetium as an impurity in the mineral yterbia, which was earlier thought to consist entirely of ytterbium. The dispute on the priority of the discovery occurred shortly after, with Urbain and Welsbach accusing each other of publishing results influenced by the published research of the other; the naming honour went to Urbain as he hd published his results earlier.*

Properties

PHYSICAL PROPERTIES-

Lutetium is a silvery white metal that is quite soft and ductile. It has a melting point of 1652 C (3006 F) and a boiling point of 3327 C (6021 F). It's density is 8.49 grams per centimeter cube.

CHEMICAL PROPERTIES-

Lutetium reacts slowly with water and dissolves in acids.

Natural Occurrence

Being one of the rarest earth metals, occurs as a silvery white metal and is stable in the air. It usually occurs in rare earth minerals like Xenotime, Monazite and Euxenite. It is also found in the products of nuclear fission. The abundance of lutetium on the Earth's crust is about 2.5%. The main mining countries are: China, USA, Brazil, India, Sri Lanka and Australia.

Uses

Lutetium, being one of the most expensive lanthanide, in the form of Lutetium oxide (Lu2O3) is used to make catalysts for cracking hydrocarbons in petrochemical industry. It is used in cancer therapy. Due to it's long half life, it is used to date the age of meteorites.

Fun Facts

- *Latest natural earth element discovered.*
- *Lutetium was the hardest lanthanide element discovered.*
- *It is the most expensive lanthanide.*
- *Atoms of lutetium are the smallest of any lanthanide element.*
- *Only 10 tons of lutetium are produced globally every year.*

Health and Environmental Effects

HEALTH EFFECTS-

Lutetium is mildly toxic by ingestion, but it's insoluble salts are non-toxic. Just like other rare earth metals, lutetium is regarded as having low toxicity but it should be handled with care.

ENVIRONMENATL EFFECTS-

Metal dust of lutetium is regarded as a fire and explosion hazard. But the metal doesn't pose any threat to flora and fauna.

Isotopes

Two naturally occurring isotopes of lutetium have been identified. Lutetium-175 is a stable isotope. The other natural isotope Lutetium-176,has a life of nearly 38 trillion years. 32 synthetic radioisotopes have been synthesized.