POLONIUM

Atomic Number 84

• ELEMENTOPEDIA •

DISCOVERY

USES

PHYSICAL CHARACTERISTICS

FUN FACTS

ISOTOPES

Presented by – Parth Mahajan [XII A]

84
Po
Polonium
(209)

Marie Curie

The energy released by polonium during its radioactive breakdown is used in compact heat sources in space probes. This is the Mariner 10, launched November 3, 1973, on the first trip to the planet

•DISCOVERY•

Polonium was discovered in 1898 by Marie and Pierre Curie, when it was extracted from the uranium ore pitchblende and identified solely by its strong radioactivity: it was the first element to be so discovered. Polonium was named after Marie Curie's homeland of Poland.

•PHYSICAL CHARACTERISTICS•

Atomic number (number of protons in the nucleus): 84
Atomic symbol (on the periodic table of the elements): Po
Atomic weight (average mass of the atom): 209
Density: 9.32 grams per cubic centimeter
Phase at room temperature: Solid
Melting point: 489.2 degrees Fahrenheit (254 degrees Celsius)
Boiling point: 1,763.6 degrees F (962 degrees C)
Most common isotope: Po-210 which has a half-life of only 138 days

•USES•

Polonium is an alpha-emitter, and is used as an alpha-particle source in the form of a thin film on a stainless steel disc. These are used in antistatic devices and for research purposes.

A single gram of polonium will reach a temperature of 500°C as a result of the alpha radiation emitted. This makes it useful as a source of heat for space equipment.

It can be mixed or alloyed with beryllium to provide a source of neutrons.

POLONIUM

•ISOTOPES•

Polonium has 42 known isotopes, all of which are radioactive. They have atomic masses that range from 186 to 227 u. 210Po (half-life 138.376 days) is the most widely available and is made via neutron capture by natural bismuth. The longer-lived 209Po (half-life 125.2±3.3 years, longest-lived of all polonium isotopes) and 208Po (half-life 2.9 years) can be made through the alpha, proton, or deuteron bombardment of lead or bismuth in a cyclotron.

•FACTS•

- it is hundreds of times more radioactive than uranium.
- It emits a blue glow as it decays, or breaks down. In fact, Marie Curie described the radioactive glow as 'fairy lights.'
- Polonium has more isotopes, or forms of an element with varying numbers of neutrons, than any other element.
- All isotopes of polonium are radioactive.
- Polonium is found in cigarettes. This is because fertilizers used to grow tobacco contain elements that break down into polonium.
- There is debate on whether or not polonium is a metal or metalloid, which is an element that has metallic and non-metallic properties.