ACTINIUM

Element symbol: Ac
Atomic number: 89

Actinium glows blue: a glorious, resplendent and beautiful blue. It is the only element that glows by itself.

Actinium is the first of the Actinide series of the rare earths: the series are named after Actinium. All of the Actinides are radioactive. Actinium was the first non-primordial element (primordial elements are those which have existed in their current state since before the earth was formed, in other words their half-life is greater than 108 years) to be discovered.

Naturally occurring Actinium (^{227}Ac) has a mass number of 227 and a half-life of 21.7 years. An isotope (^{228}Ac) also occurs in nature with a half-life of about 7 hours. There are at least another 30 artificial isotopes with half-lives ranging from about ten hours to nanoseconds, and with mass numbers ranging from 206 to 236.

Actinium is a silvery-white coloured metal. It has a melting point of 1,050 °C, and a boiling point estimated to be about 3,200 °C. The melting point is similar to Gold and Uranium and more than twice the melting point of Lead. Actinium has a density of 10.07 grams per cubic centimetre: which is a bit lighter than Lead, but heavier than Bismuth, Copper and Nickel.

Actinium was discovered by Andre-Louis Debierne in France in 1899. Andre-Louis was a close friend of Marie and Pierre Curie who discovered Polonium and Radium at about the same time. Andre-Louis Debierne named the element 'Actinium' from the Greek word "aktinos" meaning 'ray' or 'beam'.

Friedrich Otto Giesel independently discovered Actinium in 1902 and suggested the name 'Emanium' meaning to 'give off rays'. It is interesting that both researchers independently chose a name that reflected Actinium's most notable attribute: its glow.

Neither the element, nor any of its compounds, has any industrial uses. The primary users of Actinium are scientific researchers, who utilize it as a source of neutrons in nuclear research and it has been used in thermoelectric power generation.

Naturally occurring Actinium is the only element with the most stable isotope that glows. The glow is believed to be an effect of ionisation of the air by the emitted alpha particles (Actinium is also a beta-emitter). The same effect is seen in the blue glow of sparks of electricity and it has also been observed in ion beams from particle accelerators. Some other isotopes of radioactive elements glow with the same blue colour, and for the same reason, but they are the shorter-lived and more unstable isotopes.

Provided by the element sponsor Andrew Martin

ARTISTS DESCRIPTION

Actinium glows blue. It is highly radioactive and upon exposure to this substance the human body accumulates it in the surface layers of the skeleton.

CARRIE-ANN SMITH