

Americium - Am

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Atomic number	95
Atomic mass	(243) g.mol ⁻¹
Electronegativity according to Pauling	unknown
Density	13.67 g.cm ⁻³ at 20°C
Melting point	994 °C
Boiling point	2607 °C
Vanderwaals radius	unknown
Ionic radius	unknown
Isotopes	8
Electronic shell	[Rn] 5f ⁷ 7s ²
Energy of first ionisation	578 kJ.mol ⁻¹
Discovered by	G.T. Seaborg in 1945

Americium

Americium is a silvery-white synthetic metal. It slowly tarnishes in dry air, but it is resistant to alkalis. It is denser than lead. Several americium compounds have been made and these are generally coloured - for example, the chloride is pink.

Applications

Americium has some uses: it is used in some smoke detectors, as portable gamma ray source in radiography, to help to create flat glass. However this isotope is extremely expensive to produce in usable quantities.

Americium in the environment

Americium probably does occur naturally on Earth, but only in incredibly tiny amounts in uranium minerals where nuclear reactions may occasionally produce an atom. There are no natural sources of americium, but it is likely to have been present at times in the past when local concentrations of uranium were sufficient to cause nuclear reactions.

Americium can be added during accidental release in nuclear production plants. Americium, as the isotope americium-243, is produced in kilogram quantities from plutonium-239.

Health effects of americium

Humans may be exposed to higher concentrations of americium through food, breathing or skin contact, because of the release of americium during nuclear production and nuclear accidents. People that work in nuclear power plants and people that live near nuclear power plants may be exposed to higher levels of americium.

The radiation from exposure to americium is the primary cause of health effects from absorbed americium. Americium moves rapidly through the body after uptake and is concentrated within the bones for a long period of time. During this storage americium will slowly decay and release radioactive particles and rays. These rays can cause alteration of genetic materials and bone cancers.

Damage to organs due to americium exposure is highly unlikely for humans, because americium is accumulated in organs only a short period of time.

Environmental effects of americium

Americium consists mainly of manmade radioactive isotopes. These may be present in soils and waters in very small amounts as a result of atmospheric nuclear weapons testing prior to the nuclear test ban of 1963. Americium from atmospheric nuclear weapons tests may remain in the atmosphere for decades travelling all around the world and settling slowly to earth. Its isotopes decay very slowly in the environment and as a result they can do harm to plants and animals. When animals are exposed to extreme levels of americium, results may be damage to organs such as the lungs, liver and thyroid.

Americium that is present in soils may end up in plants, but only in small amounts. Usually americium particles are stored in parts of the plant that animals will not eat. Within fish very little americium builds up in the flesh or other edible parts and as a result it will not accumulate within food chains.