

Americium

Am

General Information

Discovery

Americium was discovered by G.T. Seaborg, R.A. James, L.O. Morgan and A. Ghiorso in 1944 in Chicago, USA.

Appearance

Americium is a radioactive, silvery metal. It tarnishes slowly in dry air at room temperature.

Source

Americium can be prepared chemically by the reduction of americium(III) fluoride with barium, or americium(IV) oxide with lanthanum. However, it is produced in nuclear reactors by the neutron bombardment of plutonium, and this is the greatest source of the element.

Uses

Americium has few uses other than in smoke alarms. It is of interest as it is part of the decay sequence that occurs in nuclear power production.

Biological Role

Americium has no known biological role. It is toxic due to its radioactivity.

General Information

Americium is attacked by air, steam and acids, but not by alkalis.

Physical Information

Atomic Number	95
Relative Atomic Mass ($^{12}\text{C}=12.000$)	243 (radioactive)
Melting Point/K	1267
Boiling Point/K	2880
Density/kg m ⁻³	13670 (293K)
Ground State Electron Configuration	[Rn]5f ⁷ s ²

Key Isotopes

Nuclide	²⁴¹ Am	²⁴³ Am
Atomic mass	241.06	243.06
Natural abundance	0%	0%
Half-life	458 yrs	7.4x10 ³ yrs

Ionisation Energies/kJ mol⁻¹

M - M ⁺	578.2
M ⁺ - M ²⁺	
M ²⁺ - M ³⁺	
M ³⁺ - M ⁴⁺	
M ⁴⁺ - M ⁵⁺	
M ⁵⁺ - M ⁶⁺	
M ⁶⁺ - M ⁷⁺	
M ⁷⁺ - M ⁸⁺	
M ⁸⁺ - M ⁹⁺	
M ⁹⁺ - M ¹⁰⁺	

Other Information

Enthalpy of Fusion/kJ mol ⁻¹	14.4
Enthalpy of Vaporisation/kJ mol ⁻¹	238.5

Oxidation States

Main	Am ⁺³
Others	Am ⁺² , Am ⁺⁴ , Am ⁺⁵ , Am ⁺⁶