

Neptunium

Np

General Information

Discovery

Neptunium was discovered by E.M. McMillan and P. Abelson in 1940 in California, USA.

Appearance

Neptunium is a radioactive silvery metal.

Source

Neptunium is obtained as a by-product from nuclear reactors. Trace quantities occur naturally in uranium ores.

Uses

Neptunium is little used outside research.

Biological Role

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

General Information

Neptunium is attacked by oxygen, steam and acids, but not by alkalis.

Physical Information

Atomic Number	93
Relative Atomic Mass ($^{12}\text{C}=12.000$)	237.05
Melting Point/K	913
Boiling Point/K	4175
Density/kg m ⁻³	20250 (293K)
Ground State Electron Configuration	[Rn]5f ⁴ 6d ¹ 7s ²

Key Isotopes

Nuclide	^{237}Np
Atomic mass	237.05
Natural abundance	0%
Half-life	2.14×10^6 yrs

Ionisation Energies/kJ mol⁻¹

M - M ⁺	597
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	9.46
Enthalpy of Vaporisation/kJ mol ⁻¹	336.6

Oxidation States

Main	Np ⁺⁵
Others	Np ⁺² , Np ⁺³ , Np ⁺⁴ , Np ⁺⁶ , Np ⁺⁷