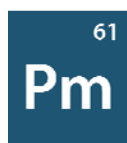


Isotopes of Promethium

Isotope	Atomic Mass	Half-life	Mode of Decay	Nuclear Spin	Nuclear Magnetic Moment
Pm-143	142.910928	265 days	EC to Nd-143	5/2	3.8
Pm-144	143.912586	360 days	EC to Nd-144	5	1.7
Pm-145	144.912743	17.70 years	EC to Nd-145; α to Pr-141	5/2	No data available
Pm-146	145.914693	5.53 years	EC to Nd-146; β^- to Sm-146	3	No data available
Pm-147	146.915134	2.6234 years	β^- to Sm-147	7/2	2.6
Pm-148	147.91747	5.37 days	β^- to Sm-148	1	2.0
Pm-149	148.918330	2.212 days	β^- to Sm-149	7/2	3.3
Pm-150	149.92098	2.68 hours	β^- to Sm-150	1	No data available
Pm-151	150.92120	1.183 days	β^- to Sm-151	5/2	1.8



Promethium was first produced and characterized at Oak Ridge National Laboratory (then Clinton Laboratories), Oak Ridge, Tennessee, USA, in 1945 by Jacob A. Marinsky, Lawrence E. Glendenin and Charles D. Coryell. Its name was originally spelled “prometheum” (and was subsequently changed to its current spelling), referring to Prometheus, the Titan in Greek mythology who stole fire from Mount Olympus and brought it down to humans.

Promethium is a silvery-white metal that does not occur in metallic form in nature. Minute quantities are associated with other rare earths. Because of its radioactivity, the metal and its salts luminesce in the dark, giving a pale blue or greenish glow. It is insoluble in water. It forms all of its compounds in a +3 oxidation state — several compounds have been prepared and are well characterized.

Promethium has very limited applications. It is used in phosphor lights to produce signals. It is also used as a beta particle source for thickness gauges, nuclear batteries and portable x-ray units. All isotopes of promethium, along with their salts, present a radiation hazard from exposure to beta and gamma rays.

Properties of Promethium

Name	Promethium
Symbol	Pm
Atomic number	61
Atomic weight	145
Standard state	Solid at 298 °K
CAS Registry ID	7440-12-2
Group in periodic table	N/A
Group name	Lanthanoid
Period in periodic table	6 (Lanthanoid)
Block in periodic table	f-block
Color	Metallic
Classification	Metallic
Melting point	1100 °C
Boiling point	3000 °C
Vaporization point	2460 °C
Thermal conductivity	15.00 W/(m·K)
Electrical resistivity	About 75 x 10 ⁻⁸ Ω·cm
Heat of vaporization	290.00 kJ·mol ⁻¹
Heat of fusion	About 7.70 kJ·mol ⁻¹
Density of solid	7.26 g/cm ³
Electron configuration	[Xe]4f ⁵ 6s ²
Ionic radius	Pm ³⁺ : 0.98 Å
Oxidation state	+3