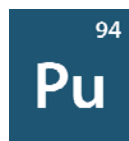


Isotopes of Plutonium

Isotope	Atomic Mass	Half-life	Mode of Decay	Nuclear Spin	Nuclear Magnetic Moment
Pu-236	236.04605	2.87 years	α to U-232; SF	0	No data available
Pu-237	237.04840	45.70 days	EC to Np-237; α to U-232	7/2	No data available
Pu-238	238.04955	87.74 years	α to U-234; SF	0	No data available
Pu-239	239.05216	24,110 years	α to U-235; SF	1/2	0.203
Pu-240	240.05381	6537 years	α to U-236; SF	0	No data available
Pu-241	241.05684	14.40 years	α to U-237; SF; β^- to Am-241	5/2	-0.683
Pu-242	242.05874	3.76×10^5 years	α to U-238; SF	0	No data available
Pu-243	243.06200	4.956 hours	β^- to Am-243	7/2	No data available
Pu-244	244.064199	8.20×10^7 years	α to U-240; SF	0	No data available
Pu-245	245.06774	10.50 hours	β^- to Am-245	9/2	No data available
Pu-246	246.07020	10.85 days	β^- to Am-246	0	No data available



Plutonium, named for the planet Pluto, is the second transuranium element of the actinide series to have been discovered. It was synthesized in 1940 by Glenn T. Seaborg, Joseph William Kennedy, Edward M. McMillan and Arthur C. Wahl in a cyclotron in Berkeley, California, USA.

Plutonium, like most metals, has a bright silvery appearance at first, much like nickel, but it oxidizes very quickly to a dull gray, although yellow and olive green are also reported. At room temperature plutonium is in its α form (*alpha*). This, the most common allotrope of the element, is about as hard and brittle as grey cast iron unless it is alloyed with other metals to make it soft and ductile. Unlike most metals, plutonium is not a good conductor of heat or electricity. It is a reactive metal. In moist air or moist argon, it oxidizes rapidly, producing a mixture of oxides and hydrides. Plutonium can also form alloys and intermediate compounds with most other metals.

Twenty radioactive isotopes of plutonium have been characterized. The longest-lived are Plutonium-244, with a half-life of about 80.8 million years; Plutonium-242, with a half-life of about 373,300 years; and Plutonium-239, with a half-life of 24,110 years. All of the remaining radioactive isotopes have half-lives that are less than 7,000 years. Of great importance is Plutonium-239, one kilogram of which provides the equivalent of nearly 22 million kilowatt hours of heat energy. The complete detonation of a kilogram of plutonium produces an explosion equal to that of about 20,000 tons of chemical explosive.

Practical applications of plutonium include nuclear weaponry, electrical power generation, spacecraft power sources, artificial heart pacemakers and scientific research.

Isotopes and compounds of plutonium are radioactive and accumulate in bone marrow. Acute or longer-term exposure can carry a danger of serious health outcomes including radiation sickness, genetic damage, cancer and death. The danger increases with the amount of exposure.

Properties of Plutonium

Name	Plutonium
Symbol	Pu
Atomic number	94
Atomic weight	[244]
Standard state	Solid at 298 °K
CAS Registry ID	7440-07-5
Group in periodic table	N/A
Group name	Actinoid
Period in periodic table	7 (Actinoid)
Block in periodic table	f-block
Color	Silvery white
Classification	Metallic
Melting point	912.50 °K [or 639.40 °C or 1182.90 °F]
Boiling point	3503 °K [or 3230 °C or 5846 °F]
Density of solid	19.82 g/cm ³
Electron configuration	[Rn]5f ⁶ 7s ²