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Protactinium

231.036

Key Properties

Atomic Mass	231.036
Category	actinide
State at 20°C	solid
Melting Point	1572°C
Boiling Point	4000°C
Density	15.37
Electron Config	[Rn] 5f26d17s2
Electronegativity	1.5
Year Discovered	1913
Discovered By	Kasimir Fajans & Oswald Helmuth Göhring

Did You Know?

- 1 Its name means \
- 2 It is one of the rarest and most expensive naturally occurring elements. The UK Atomic Energy Authority once extracted 125 grams of it from 60 tons of nuclear waste at a cost of \$500,000.
- 3 For a long time after its discovery, it was one of the most difficult elements to study due to its scarcity, high radioactivity, and toxicity.
- 4 It is a superconductor at temperatures below 1.4 K.
- 5 There are no commercial uses for protactinium outside of basic scientific research.

APPEARANCE

Protactinium is a dense, silvery-gray, highly radioactive metal.

SUPERHERO PERSONA

"The Parent, a rare and expensive hero whose destiny is to decay into Actinium."

EVERYDAY CONNECTION

Protactinium has no everyday connection, used only in research.

POP CULTURE

Protactinium is one of the rarest and most expensive naturally occurring elements.

Protactinium: The Radioactive Progenitor

Protactinium is a silvery, highly radioactive metal. Its name comes from the Greek words protos ("first" or "parent") and actinium, because it decays into the element actinium. It is extremely rare and very toxic due to its strong radioactivity, so it is used only for scientific research.

A Brief History of Protactinium

The possibility of an element between thorium and uranium was predicted by Dmitri Mendeleev, but it wasn't confirmed until decades later.

1913: German scientists Kasimir Fajans and Otto Göhring identified a short-lived isotope of the element. They named it brevium because of its very short half-life.

1918: A longer-lived isotope, protactinium-231 (half-life: 32,500 years), was isolated from uranium ore in Berlin by Lise Meitner and her team, securing the element's place on the periodic table.

1934: Aristid von Grosse succeeded in producing the first sample of pure protactinium metal.

Natural Abundance & Biological Role

Protactinium occurs in tiny amounts in nature, usually within uranium ores as part of radioactive decay chains. It can also be extracted from spent nuclear fuel rods.

Protactinium has no biological role. Its extreme radioactivity makes it highly toxic and dangerous to handle.