

99
Es
Einsteinium
[252]

Key Properties

Atomic Mass	[252]
Category	actinide
State at 20°C	solid
Melting Point	860°C
Boiling Point	null
Density	8.84*
Electron Config	[Rn] 5f117s2
Electronegativity	1.3
Year Discovered	1952
Discovered By	Albert Ghiorso and colleagues

Did You Know?

- 1 It was discovered unexpectedly in the debris from the first successful test of a hydrogen bomb, 'Ivy Mike', in 1952.
- 2 It was named in honor of the renowned physicist Albert Einstein.
- 3 It is the heaviest element on the periodic table that has ever been seen with the naked eye, though only in microscopic amounts.
- 4 The element is so radioactive that it glows with a blue light.
- 5 Due to its intense radioactivity and the difficulty in producing it, it has no uses outside of basic research aimed at creating superheavy elements.

APPEARANCE

Einsteinium is a synthetic, highly radioactive metal.

SUPERHERO PERSONA

"The Genius, a hero born from a hydrogen bomb, named after the greatest mind of the 20th century."

EVERYDAY CONNECTION

Einsteinium has no everyday connection, discovered in H-bomb debris.

POP CULTURE

Einsteinium is the heaviest element observed in macroscopic quantities.

Overview of Einsteinium

Einsteinium is a synthetic, silvery metal in the actinide series, with atomic number 99. It is highly radioactive and produced only in microgram to milligram quantities each year. Named in honor of Albert Einstein, einsteinium has no commercial uses but is important in research on the chemistry of the heaviest elements.

How Einsteinium Was Discovered

Einsteinium was discovered in 1952 under extraordinary circumstances. A team of American scientists, including Gregory Choppin, Stanley Thompson, and Albert Ghiorso, identified it in the fallout from the first thermonuclear explosion, carried out on the Pacific atoll of Enewetak.

The element was formed when uranium atoms absorbed multiple neutrons during the explosion, creating einsteinium-253, an isotope with a half-life of 20.5 days. This unique origin earned it the nickname "the atomic bomb element."

Uses of Einsteinium

Due to its extreme radioactivity and scarcity, einsteinium has no practical applications outside of scientific research. It is mainly used to:

Study heavy elements: Einsteinium provides insight into the behavior of transuranium and superheavy elements, helping scientists explore the edge of the periodic table.

Produce new isotopes: Small amounts of einsteinium have been used to synthesize other elements, including mendelevium (Md).

Natural Occurrence and Production of Einsteinium

Einsteinium does not occur naturally. It is produced artificially in nuclear reactors by bombarding plutonium or californium with neutrons.

Because production is extremely difficult, only milligram quantities are made annually. In 1961, researchers were able to collect a weighable amount for the first time—just 10 micrograms.

Biological Role of Einsteinium

Einsteinium has no known biological role. It is considered extremely toxic because of its radioactivity and can cause severe damage to living tissues if not handled under strict safety conditions.