

Einsteinium (Es) - Student Datasheet

Element 99 | Actinide | Period 7 | f-block

Atomic number	99
Atomic mass	[252]
Electron configuration	[Rn] 5f ¹¹ 7s ²
Reference isotope	252Es
Density	Unknown
Melting point	1133 K (reported reference)
Boiling point	Unknown
Structure	Face-centred cubic (FCC) - limited electron-diffraction evidence

Big idea

Einsteinium exists only in very small quantities. Unlike later actinides whose pure metal has not been prepared, historical electron-diffraction work did obtain limited FCC structural evidence for tiny einsteinium-metal samples; that evidence is shown with an explicit caveat.

Structure and evidence

Electron-diffraction lines from eleven tiny einsteinium-metal samples were indexed as face-centred cubic (FCC), with a reported lattice parameter near 0.575 nm. Because intense self-irradiation degraded crystallinity and the available material was minute, Element Lookup labels this as limited small-sample structural evidence rather than an ordinary bulk-crystal measurement.

Five things to remember

- Atomic number 99 means every einsteinium nucleus has 99 protons.
- The ground-state/reference electron configuration is [Rn] 5f¹¹ 7s².
- The representative teaching isotope is 252Es.
- Historical electron-diffraction work indexed eleven tiny einsteinium-metal samples as face-centred cubic (FCC), but self-irradiation and sample scarcity strongly limit the evidence.
- Material structure status: FCC supported by limited small-sample electron-diffraction evidence; not an ordinary macroscopic crystal measurement.

Evidence, uses and context

Evidence boundary

Atomic identity and isotope data are established/evaluated. Historical electron diffraction provides limited FCC structural evidence for tiny einsteinium-metal samples (eleven samples; reported a about 0.575 nm), while severe self-irradiation and sample scarcity make the material evidence much weaker than for ordinary bulk metals. Unknown density/boiling/other bulk values remain visibly unknown.

Where is it used?

Scientific research only - Research-only context; no operational production or handling guidance.

Actinide chemistry and nuclear-structure studies - Research-only context; no operational production or handling guidance.

Discovery and history

1952 - Albert Ghiorso and colleagues identified einsteinium in debris from the first thermonuclear test.

Naming / context - The element name and discovery story are part of the historical record; search-led questions are answered without turning history into scientific evidence for bulk properties.

Today - Current use is described at the level supported by the element's availability and evidence, with research-only elements kept research-only.

Phase / temperature context

A melting reference of 1133 K (reported reference) is reported for teaching context, while an ordinary boiling point is not established here. The page does not infer a precise gas transition from theory.

Safety / interpretation boundary

This page is educational and non-operational. It provides no radioactive-material production, separation, source-preparation, handling or access instructions.

Questions and review

Direct answer first; explanation follows from the same reviewed element record.

What is einsteinium?

Einsteinium is chemical element 99, symbol Es, classified here as actinide.

What is the atomic number of einsteinium?

The atomic number is 99, meaning every einsteinium nucleus has 99 protons.

What is the symbol for einsteinium?

The chemical symbol is Es.

What is einsteinium used for?

Einsteinium has no ordinary commercial use; it is used only in scientific research.

Who discovered einsteinium?

Albert Ghiorso and colleagues identified it in 1952 from thermonuclear-test debris.

What does einsteinium look like?

Einsteinium is described as a radioactive metallic element, but only tiny quantities have existed. Historical electron diffraction supports an FCC metal structure in small samples; that does not amount to a normal macroscopic specimen whose bulk appearance has been directly characterized.

What is einsteinium's crystal structure?

Limited electron-diffraction evidence from eleven tiny metal samples was indexed as face-centred cubic (FCC). The result is scientifically useful but should be presented with a strong small-sample/self-irradiation caveat rather than as an ordinary bulk crystal measurement.

Quick review

What is Einsteinium's atomic number?

Answer: 99

Atomic number 99 defines Einsteinium by its proton count.

Which statement best describes the material evidence for Einsteinium?

Answer: Bulk crystal structure not established for this teaching model

The Structure view follows measured/reviewed evidence; unknown bulk structures remain unknown.

What is the safest rule for Einsteinium uses?

Answer: Distinguish the element from its isotopes, compounds and engineered materials

Elemental, isotope-specific and compound properties must not be conflated.

Sources

Royal Society of Chemistry - Einsteinium: <https://periodic-table.rsc.org/element/99/>

NIST - Atomic Weights and Isotopic Compositions: https://physics.nist.gov/cgi-bin/Compositions/stand_alone.pl

IUPAC - Periodic Table of Elements: <https://iupac.org/what-we-do/periodic-table-of-elements/>

OSTI / UCRL-85944 - Chemical properties of einsteinium; metallic-state electron diffraction: <https://www.osti.gov/servlets/purl/5678433>