

Livermorium (Lv) - Student Datasheet

Element 116 · Synthetic superheavy Group 16 element · source-reviewed learning reference

Livermorium is element 116, a synthetic superheavy Group 16 element made atom-at-a-time. Its nuclear production and decay are measured; its chemistry is mostly theoretical and its macroscopic state, density, melting point and crystal structure remain unknown.

Quick reference

Atomic number	116
Relative atomic mass	[293]
Electron configuration	[Rn] 5f ¹⁴ 6d ¹⁰ 7s ² 7p ⁴
Period / group / block	7 / 16 / p
State context	Macroscopic bulk state not experimentally established
Density	Unknown
Melting / transition	Unknown
Boiling / gas reference	Unknown
Oxidation states	Predicted +2 / +4 and other Group 16 possibilities; not experimentally established as bulk chemistry
Electronegativity	Unknown

Structure & orbitals

Only a few livermorium atoms have been produced. No measured bulk lattice, density or ordinary state exists, so the material viewer remains explicitly unknown.

The 7s/7p probability clouds are nonrelativistic teaching shapes. They support orbital literacy but do not claim measured livermorium chemistry or bulk electron density.

Phase behavior

No measured macroscopic phase boundaries exist for livermorium. The temperature explorer remains in an explicitly unknown state rather than drawing theoretical transitions as established fact.

Five things to remember

- Atomic number 116 means 116 protons.
- Livermorium is synthetic; all known isotopes are radioactive.
- The reference configuration ends 7s²7p⁴.
- Most chemistry is predicted rather than experimentally established.
- Bulk density, melting point, boiling point and crystal structure are unknown.

Livermorium: Real World & Signature Science

Element-specific science, uses and history

Big idea

Being below polonium in Group 16 does not give us permission to draw “livermorium metal.” Relativistic calculations can guide hypotheses, but they do not turn an unmeasured bulk property into fact.

Why this element is scientifically distinctive

Rotate a ^{293}Lv teaching nucleus and 7s/7p probability clouds, then move through the Evidence Lens from measured synthesis/decay to predicted relativistic chemistry and genuinely unknown bulk material properties.

Synthesis/decay evidence	Livermorium atoms have been produced in superheavy-element research and identified through decay chains.
Dubna-Livermore collaboration	The element’s discovery history reflects collaboration between JINR Dubna and Lawrence Livermore National Laboratory.
Naming	The name livermorium honors Lawrence Livermore National Laboratory and was approved by IUPAC in 2012.
Relativistic chemistry	Theory predicts substantial departures from simple lighter Group 16 behavior because of strong relativistic effects.
Unknown bulk material	No practical use, appearance, density, ordinary phase boundaries or crystal lattice can be asserted from a macroscopic sample.

How livermorium knowledge is built: decay evidence plus theory

1. Superheavy-element research creates extremely small numbers of atoms; operational synthesis settings are outside this guide.
2. Decay chains identify nuclei and connect them to daughter products.
3. Very short lifetimes and atom counts constrain direct chemical measurement.
4. Relativistic quantum-chemical calculations predict trends, but predictions remain visibly separate from measured evidence.

History checkpoints

2000s	JINR and Lawrence Livermore collaborators reported production/decay evidence for element 116 isotopes.
2011	IUPAC/IUPAP review recognized discovery claims for element 116.
2012	IUPAC approved the name livermorium (Lv), honoring Lawrence Livermore National Laboratory.
Today	Research focuses on nuclear stability and theoretical superheavy chemistry.

Livermorium: Isotopes, Questions & Evidence

Evidence status and learner self-check

Isotope context

²⁹³ Lv	Radioactive superheavy isotope	Reference teaching nucleus with 116 protons and 177 neutrons.
²⁹² Lv	Radioactive isotope	Another short-lived isotope known from superheavy research.
Livermorium isotope context	No stable isotopes	All known isotopes are synthetic and radioactive.

Common questions

What is livermorium?

Livermorium is synthetic element 116, placed in Group 16.

Is livermorium a metal?

Some theoretical descriptions predict metallic behavior, but no macroscopic metal sample has established bulk properties.

What does livermorium look like?

No experimentally established macroscopic appearance exists.

Who discovered livermorium?

Its discovery history involves JINR Dubna and Lawrence Livermore collaborators.

Quick self-check

Q: What is livermorium's atomic number? | Answer: 116. Atomic number equals proton count.

Q: What is the measured bulk density? | Answer: Unknown. No macroscopic density is established.

Q: What is the evidence status of most chemical predictions? | Answer: Predicted. Theory must remain labelled theory.

Evidence & safety

Nuclear synthesis/decay establishes element identity. The reference electron configuration and chemistry are theory/evaluation-led. Bulk density, phase boundaries, appearance and crystal structure are unknown.

Livermorium exists only in specialized accelerator research. No synthesis, beam, target, separation, access or handling guidance is provided.

Core sources

Royal Society of Chemistry - Livermorium

<https://periodic-table.rsc.org/element/116/livermorium>

IUPAC - Livermorium naming / periodic table resources

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