

103

Lr

Lawrencium

[262]

Key Properties

Atomic Mass	[262]
Category	actinide
State at 20°C	solid
Melting Point	1627°C
Boiling Point	null
Density	null
Electron Config	[Rn] 5f147s27p1
Electronegativity	1.3
Year Discovered	1961
Discovered By	Albert Ghiorso

Did You Know?

- 1 It is named in honor of Ernest O. Lawrence, the Nobel laureate who invented the cyclotron particle accelerator, which was crucial for discovering many synthetic elements.
- 2 It is the final element in the actinide series of the periodic table.
- 3 It is extremely difficult to produce, and its chemical properties have been studied on a one-atom-at-a-time basis.
- 4 Its most stable isotope has a half-life of about 11 hours.
- 5 There is some scientific debate as to whether lawrencium should be in Group 3 of the periodic table, along with scandium and yttrium.

APPEARANCE

Lawrencium is a synthetic, radioactive metal.

SUPERHERO PERSONA

"The Cyclotron, a hero named for the inventor of the machine that created so many new elements."

EVERYDAY CONNECTION

Lawrencium has no everyday connection, used only in research.

POP CULTURE

Lawrencium is the last member of the actinide series.

Overview of Lawrencium - The Elusive Final Actinide

Lawrencium is a synthetic, highly radioactive metal with atomic number 103. It is the last element in the actinide series of the periodic table. Only a handful of atoms have ever been produced, and it has no practical applications outside of scientific research. The element was named in honor of Ernest O. Lawrence, the American physicist who invented the cyclotron particle accelerator.

How Is Lawrencium Made?

Lawrencium does not occur naturally on Earth. It is man-made in particle accelerators, where lighter atomic nuclei are fused to create heavier ones:

First Synthesis: The first reported attempt was made by bombarding californium with boron ions.

Other Methods: Later, scientists produced isotopes of lawrencium by bombarding americium with oxygen nuclei.

Because only a few atoms can be produced at a time, experiments focus on studying its decay patterns and atomic structure.

Biological Role and Uses of Lawrencium

No Biological Role: Lawrencium is not essential for life and is toxic due to its intense radioactivity.

No Practical Uses: Its extremely short half-life means lawrencium has no commercial or industrial applications.

Research Value: Its only role is helping scientists understand the limits of the periodic table and the chemistry of the heaviest elements.

History of the Discovery of Lawrencium

The discovery of lawrencium was marked by controversy between American and Soviet scientists:

1961 – American Claim: A team at the Lawrence Berkeley Laboratory (LBL) in California reported creating isotope lawrencium-257 by bombarding curium with boron. However, their results were inconsistent and difficult to reproduce.

1965 – Soviet Contribution: A team at the Joint Institute for Nuclear Research (JINR) in Dubna, USSR, produced isotope lawrencium-256 by bombarding americium with oxygen, challenging the American results.

Final Resolution: After years of debate, the International Union of Pure and Applied Chemistry (IUPAC) credited the Berkeley team with the discovery, and the element was officially named lawrencium (Lr).