Dubnium (Db)

Element 105 — Complete Summary

105
Db
Dubnium
[268]

Key Properties

Atomic Mass	[268]
Category	Transition Metals
State at 20°C	solid
Melting Point	null
Boiling Point	null
Density	29.3*
Electron Config	[Rn] 5f146d37s2
Electronegativity	null
Year Discovered	1968
Discovered By	Joint Institute for Nuclear Research (JINR)

✨ Did You Know?

1. It is named after the town of Dubna in Russia, the location of the Joint Institute for Nuclear Research (JINR), where the element was first synthesized.
2. Like its neighbors, its discovery was a subject of dispute between the Russian lab at Dubna and the American lab at Berkeley.
3. The International Union of Pure and Applied Chemistry (IUPAC) eventually gave credit for the discovery to both teams and officially named it Dubnium in 1997.
4. Its most stable isotope has a half-life of just over a day.
5. It has no uses outside of basic scientific research.

APPEARANCE
Dubnium is a synthetic, highly radioactive metal.

SUPERHERO PERSONA
"The Cold Warrior, a hero born from the scientific competition between the US and the Soviet Union."

EVERYDAY CONNECTION
Dubnium has no everyday connection, used only in research.

POP CULTURE
Dubnium's naming was part of the "Transfermium Wars" between US and Soviet labs.

Overview of Dubnium

Dubnium is a synthetic, highly radioactive transition metal with atomic number 105. Only a few atoms of dubnium have ever been produced, and its most stable isotope, dubnium-268, has a half-life of about 32 hours.

Because of its extreme rarity and short-lived nature, dubnium has no commercial uses and is studied only for scientific research into the chemistry of superheavy elements.

How Dubnium Is Made

Dubnium does not occur naturally and must be synthesized in laboratories. It is created by bombarding lighter elements with heavier ions in a particle accelerator. For example, dubnium can be produced by:

Bombarding californium-249 with nitrogen-15 ions.

Bombarding americium-243 with neon-22 ions.

These fusion reactions create a few atoms of dubnium, which decay rapidly into lighter elements.

History of Dubnium

The discovery of dubnium was one of the most disputed in modern chemistry, part of the so-called “Transfermium Wars” between American and Russian laboratories during the Cold War.

1968 – Russian claim: Scientists at the Joint Institute for Nuclear Research (JINR) in Dubna, led by Georgy Flerov, reported creating element 105 by bombarding americium with neon. They proposed the name nielsbohrium (Ns) in honor of Niels Bohr.

1970 – American claim: Researchers at the Lawrence Berkeley Laboratory (LBL) in California, led by Albert Ghiorso, produced the element by bombarding californium with neon. They suggested the name hahnium (Ha) after chemist Otto Hahn.

1997 – Resolution: After decades of dispute, the International Union of Pure and Applied Chemistry (IUPAC) officially named the element dubnium (Db), honoring the Russian city of Dubna, where much of the pioneering research took place.

Biological Role of Dubnium

Dubnium has no known biological function. It is toxic due to its intense radioactivity and exists only in trace amounts under controlled laboratory conditions.