Hassium (Hs)

Element 108 — Complete Summary

108
Hs
Hassium
[269]

Key Properties

Atomic Mass	[269]
Category	Transition Metals
State at 20°C	solid
Melting Point	null
Boiling Point	null
Density	40.7*
Electron Config	[Rn] 5f146d67s2
Electronegativity	null
Year Discovered	1984
Discovered By	GSI Helmholtz Centre for Heavy Ion Research

✨ Did You Know?

1. It is named after the German state of Hesse (Hassia in Latin), where the GSI Helmholtz Centre for Heavy Ion Research that discovered it is located.
2. The experiment that first successfully created hassium involved firing iron-58 nuclei into a lead-208 target for a week to produce just three atoms.
3. It is the heaviest element whose chemical properties have been experimentally characterized.
4. As expected for a Group 8 element, experiments have shown that it forms a stable tetroxide, similar to osmium.
5. Its most stable known isotope has a half-life of about 10 seconds.

APPEARANCE
Hassium is a synthetic, highly radioactive metal.

SUPERHERO PERSONA
"The Hessian, a hero from the German state that pioneered heavy element discovery."

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

POP CULTURE
Hassium is the heaviest element to have its chemical properties experimentally confirmed.

Overview of Hassium

Hassium is a synthetic, superheavy metal with atomic number 108. It is highly radioactive and has no stable isotopes, with the most long-lived one, hassium-277, surviving for only about 1.1 hours. Because only a few atoms have ever been produced, hassium exists purely for scientific study and has no commercial applications. The element was named after the German state of Hesse, where it was first discovered.

How Is Hassium Made?

Hassium does not occur naturally and must be created in a laboratory.

Synthesis method: It is made using a heavy ion accelerator, through a process known as cold fusion. The first successful synthesis involved bombarding lead atoms with iron nuclei, fusing them into a heavier nucleus.

Isotopes: Scientists have produced several isotopes of hassium, with mass numbers ranging from 263 to 277. All are short-lived, making the element extremely difficult to study.

Uses and Biological Role of Hassium

Scientific research only: Hassium has no practical uses outside of research. Its production in atom-scale quantities allows scientists to study the chemistry of superheavy elements and explore the limits of the periodic table.

Toxicity: As a highly radioactive element, it is considered toxic, but due to the minuscule amounts produced, it poses no real-world health risks.

Predicted properties: Based on its position in Group 8 of the periodic table, hassium is expected to behave chemically like osmium and ruthenium.

History of Hassium

The discovery of hassium was part of a Cold War–era competition between Russian and German laboratories:

1970s–1980s – Russian attempts: A team at the Joint Institute for Nuclear Research (JINR) in Dubna, Russia, made several attempts to create element 108 by bombarding heavy targets with lighter nuclei, but their results could not be confirmed.

1984 – German success: A research team at the Gesellschaft für Schwerionenforschung (GSI) in Darmstadt, Germany, led by Peter Armbruster and Gottfried Münzenberg, successfully synthesized hassium-265 by bombarding lead with iron nuclei. Their findings were confirmed by other laboratories, giving them naming rights.

Naming: The element was officially named hassium in 1997, honoring the German state of Hesse, home to the GSI laboratory.