

110  
**Ds**  
Darmstadtium  
[281]

### Key Properties

Atomic Mass	[281]
Category	unknown-properties
State at 20°C	solid
Melting Point	null
Boiling Point	null
Density	34.8*
Electron Config	[Rn] 5f146d97s1
Electronegativity	null
Year Discovered	1994
Discovered By	GSI Helmholtz Centre for Heavy Ion Research

### Did You Know?

- 1 It is named after the city of Darmstadt, Germany, where it was discovered at the GSI Helmholtz Centre for Heavy Ion Research.
- 2 The discovery was made by an international team of scientists led by Sigurd Hofmann.
- 3 It is predicted to be a very dense solid metal, possibly with a noble, silvery appearance.
- 4 Its most stable isotope has a half-life of about 12.7 seconds.
- 5 It is in Group 10, placing it below nickel, palladium, and platinum.

#### APPEARANCE

Darmstadtium is a synthetic, highly radioactive element.

#### SUPERHERO PERSONA

*"The Darmstadt Defender, a hero named for the city that became a world center for discovering new elements."*

#### EVERYDAY CONNECTION

Darmstadtium has no everyday connection, used only in research.

#### POP CULTURE

Darmstadtium is predicted to be a noble metal like platinum.

### Overview of Darmstadtium

Darmstadtium is a synthetic, highly radioactive transition metal with atomic number 110. Only a few atoms have ever been produced, and its longest-lived isotope, darmstadtium-281, has a half-life of about four minutes. Because of its extreme instability, darmstadtium has no practical uses beyond research, where it helps scientists explore the properties of superheavy elements and the limits of the periodic table.

### How Darmstadtium Is Made

Darmstadtium does not occur naturally and must be created in particle accelerators. It is produced through nuclear fusion reactions, in which lighter nuclei are combined to form heavier atoms.

The first successful synthesis was achieved by fusing nickel-62 ions with lead-208 nuclei, producing darmstadtium-269.

Other experimental attempts have involved bombarding bismuth with cobalt or plutonium with sulfur, though these were less successful.

### Uses and Biological Role of Darmstadtium

Because only a few atoms of darmstadtium have ever been made and they decay within minutes, the element has no commercial applications. Its only use is in scientific research, providing insight into the behavior of transactinides.

Darmstadtium has no known biological role and is considered toxic due to its intense radioactivity.

### History of Darmstadtium

1994 – Discovery: Darmstadtium was first synthesized at the Gesellschaft für Schwerionenforschung (GSI) in Darmstadt, Germany. A team led by Peter Armbruster and Gottfried Münzenberg successfully bombarded lead with nickel ions, creating darmstadtium-269.

International competition: Prior to this, other laboratories attempted to create the element but could not provide conclusive evidence.

Naming: After confirmation by other labs, the GSI team was granted naming rights. The element was officially named darmstadtium in 2003 to honor the city of Darmstadt, Germany, where it was discovered.