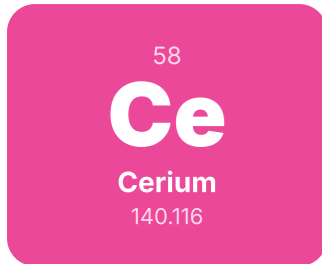


Cerium (Ce)

Element 58 — Complete Summary
theperiodictable.io



Key Properties

Atomic Mass	140.116
Category	Lanthanides
State at 20°C	solid
Melting Point	799°C
Boiling Point	3443°C
Density	6.77
Electron Config	[Xe] 4f15d16s2
Electronegativity	1.12
Year Discovered	1803
Discovered By	Jöns Jacob Berzelius & Wilhelm Hisinger

Did You Know?

- 1 It's the most abundant of the so-called 'rare earth' elements! Don't let the name fool you – it's actually more common in Earth's crust than copper!
- 2 Ever lit a campfire with a lighter? That satisfying spark comes from an alloy called ferrocerium, where Cerium plays the explosive starring role!
- 3 Cerium is a superhero for our planet, helping catalytic converters in cars slash harmful emissions and keep our air cleaner.
- 4 Want a super-smooth screen? Cerium oxide is the secret ingredient for polishing high-precision optics, like your smartphone display or telescope lenses!
- 5 This element can help clean up your kitchen! Cerium compounds assist in the self-cleaning cycles of ovens by breaking down food residue at high temperatures.
- 6 Cerium is a star in lighting too! It's a key ingredient in the phosphors that make LED lights and fluorescent lamps glow brightly.
- 7 While super useful, pure Cerium is a bit of a drama queen – it's so reactive it quickly tarnishes and even catches fire if scraped in air!
- 8 Cerium isn't just about sparks; it's also a crucial additive in some high-strength aluminum alloys, making them tougher for aerospace applications.
- 9 Talk about old-school cool! Cerium was discovered in 1803, around the same time as the dwarf planet Ceres, and scientists decided to honor the celestial body by naming the element after it.
- 10 Cerium is being explored for some fascinating medical applications, with researchers investigating its potential anti-inflammatory and antioxidant powers.
- 11 Forget toxic pigments! Cerium sulfide gives us vibrant, safe yellow and orange pigments, adding color to our world without the danger.

APPEARANCE

A shiny, silvery-white metal that's too shy to stay bright, quickly tarnishing in air.

SUPERHERO PERSONA

"Meet Cerium, the ultimate 'spark-plug' superhero! This reactive rare-earth genius ignites flames with a flick and purifies our air with its catalytic superpowers."

EVERYDAY CONNECTION

That satisfying 'clink and spark' from a cigarette lighter? Yep, that's Cerium getting the party started!

POP CULTURE

Named after the dwarf planet Ceres, this element shares its name with the Roman goddess of agriculture, hinting at its 'earthy' origins and transformative powers.

Overview of Cerium

Cerium is a soft, silvery-gray metal that belongs to the lanthanide series, often referred to as the rare earth elements. Despite the name, cerium is relatively common—more abundant in Earth's crust than tin or lead. It tarnishes quickly in air, reacts with water, and is usually stored under oil to prevent oxidation.

Uses of Cerium

Cerium's unique chemical and physical properties make it useful across several industries:

Sparking properties: Cerium is the primary component of mischmetal, an alloy that produces bright sparks when struck. This makes it the essential material in lighter "flints," alongside iron.

Catalysts: Cerium(IV) oxide (CeO₂) is widely used as a catalyst. It coats the interior walls of self-cleaning ovens to prevent residue buildup and is a vital part of catalytic converters in cars, reducing harmful emissions.

Pigments: Cerium sulfide (Ce₂S₃) is a stable, non-toxic red pigment used in paints and plastics.

Lighting and electronics: Cerium compounds are used in low-energy light bulbs, flat-screen TVs, and floodlights, as well as in polishing glass and semiconductors.

Natural Occurrence and Production of Cerium

Cerium is the most abundant of the lanthanides and does not occur in pure form naturally. It is mainly found in the minerals bastnaesite and monazite, both of which are mined extensively for rare earth production.

Pure cerium metal is extracted by electrolyzing molten cerium chloride or through metallothermic reduction using calcium.

History of Cerium

1803 – Discovery: Cerium was independently identified by Jöns Jakob Berzelius and Wilhelm Hisinger in Sweden, and Martin Heinrich Klaproth in Germany. They discovered the element in a Swedish mineral.

1875 – Isolation: Chemists William Hillebrand and Thomas Norton successfully isolated metallic cerium by passing an electric current through molten cerium chloride.

Biological Role of Cerium

Cerium has no known biological role in humans or animals and is not considered highly toxic in its pure form. Some cerium compounds can, however, irritate the skin and respiratory system in high concentrations.