Cadmium (Cd)

Element 48 — Complete Summary

theperiodictable.in

48
Cd
Cadmium
112.414

Key Properties

Atomic Mass	112.414
Category	Transition Metals
State at 20°C	solid
Melting Point	321.069°C
Boiling Point	767°C
Density	8.65
Electron Config	[Kr] 4d105s2
Electronegativity	1.69
Year Discovered	1817
Discovered By	Friedrich Stromeyer

✨ Did You Know?

1. The first rechargeable batteries, nickel-cadmium (Ni-Cd) batteries, used cadmium as a key component.
2. Cadmium compounds can produce brilliant yellow, orange, and red pigments, which were widely used in paints and plastics.
3. Cadmium is highly toxic and a known human carcinogen, and its use is now heavily restricted in many countries.
4. It is an excellent neutron absorber, so it has been used to make control rods for nuclear reactors.
5. Smokers inhale significant amounts of cadmium because tobacco plants naturally absorb it from the soil.

APPEARANCE
Cadmium is a soft, bluish-white, toxic metal.

SUPERHERO PERSONA
"The Poison Painter, a villain who creates brilliant colors but is highly toxic."

EVERYDAY CONNECTION
Cadmium is found in old, bright yellow or red paints.

POP CULTURE
Cadmium's toxicity makes it a common plot device for poisonings in crime fiction.

Overview of Cadmium

Cadmium is a soft, silvery-blue metal that is highly toxic to humans and the environment. Because of its health risks, the use of cadmium has been restricted in many industries. However, its unique chemical and physical properties still make it valuable in specialized applications, from batteries to nuclear technology.

Uses of Cadmium

Despite safety concerns, cadmium has been widely used in industry:

Batteries: Around 80% of cadmium production goes into nickel–cadmium (NiCd) rechargeable batteries, though these are increasingly being replaced by safer alternatives.

Corrosion protection: Cadmium coatings protect steel and other metals from rust, particularly in critical components such as aircraft parts and offshore structures.

Nuclear reactors: Cadmium is an excellent neutron absorber and is used in control rods to regulate nuclear fission.

Pigments: Cadmium compounds once produced vivid yellow, orange, and red pigments used in paints, plastics, and ceramics. Their use has declined due to toxicity.

History of Cadmium

1817 – Discovery: German chemist Friedrich Stromeyer discovered cadmium while investigating the discoloration of zinc carbonate. He identified the impurity as a new element, which he named after cadmia, an old term for zinc ores.

1818 – Independent discoveries: German chemists Karl Meissner and Karl Karsten also independently discovered cadmium shortly after Stromeyer.

Natural Occurrence and Production of Cadmium

Cadmium is a relatively rare element and is not found in pure form in nature. Instead, it occurs as a minor component in zinc ores, particularly in the mineral greenockite (CdS). Nearly all cadmium used commercially is obtained as a by-product of zinc refining.

Biological Role of Cadmium

Cadmium has no known biological role and is considered highly toxic. It accumulates in living organisms, including humans, where it can damage the kidneys, bones, and respiratory system. Cadmium is a suspected carcinogen and can also cause birth defects with prolonged exposure.

© 2026 theperiodictable.in — Free educational resource