

83
Bi
Bismuth
208.98

Key Properties

Atomic Mass	208.98
Category	Post-Transition Metals
State at 20°C	solid
Melting Point	271.406°C
Boiling Point	1564°C
Density	9.78
Electron Config	[Xe] 4f145d106s26p3
Electronegativity	2.02
Year Discovered	1753
Discovered By	Claude François Geoffroy

Did You Know?

- 1 It is one of the few substances, along with water and gallium, that is less dense as a solid than as a liquid, meaning solid bismuth will float on molten bismuth.
- 2 Despite being a heavy metal, bismuth has exceptionally low toxicity, which is why its compounds are the active ingredient in stomach-soothing medicines like Pepto-Bismol.
- 3 Bismuth has the most striking iridescent tarnish, forming a rainbow-colored oxide layer on its surface, which is why it's popular for decorative crystals.
- 4 It is the most naturally diamagnetic element, meaning it is strongly repelled by magnetic fields.
- 5 Alloys of bismuth with low melting points are used in the fusible plugs of automatic fire sprinkler systems.

APPEARANCE

Bismuth is a brittle, silvery-white metal with a pinkish, iridescent tarnish.

SUPERHERO PERSONA

"The Stomach Soother, the surprisingly non-toxic heavy metal hero who calms upset stomachs."

EVERYDAY CONNECTION

Bismuth is found as the active ingredient in Pepto-Bismol.

POP CULTURE

Bismuth forms beautiful rainbow-colored crystals often used as decorations.

Overview of Bismuth

Bismuth is a dense, brittle, silvery-white metal with a distinctive pinkish iridescent sheen. It is often mistaken for lead in history due to its weight and low melting point, but bismuth is chemically distinct. Today, it is valued for its alloys, pigments, and medicinal compounds, and it is notable for being one of the few heavy metals considered relatively non-toxic.

Uses of Bismuth

Bismuth's versatility comes from both its alloys and its chemical compounds:

Safety devices: Low-melting-point bismuth alloys are used in fire detectors, extinguishers, and electric fuses. When exposed to heat, the alloys melt and trigger safety mechanisms.

Cosmetics and pigments: Bismuth oxide provides a yellow pigment in paints and cosmetics, while bismuth oxychloride (BiClO) produces a pearly, shimmering effect used in makeup.

Medicine: Compounds such as basic bismuth carbonate are active ingredients in antacid tablets and liquids used to treat indigestion and stomach upset.

Manufacturing: Bismuth alloys are employed as solders in electronics and plumbing, where their low melting points are advantageous.

Natural Occurrence and Production of Bismuth

Bismuth occurs naturally both in its pure, metallic state and in minerals such as bismuthinite and bismite. Commercially, most bismuth is obtained as a by-product during the refining of other metals, particularly lead, copper, tin, silver, and gold.

History of Bismuth

1400s – Early confusion: Alchemists recognized bismuth as a metal but often confused it with lead due to their similar appearance.

1500s – Inca technology: The Incas of South America used bismuth in their bronze alloys as early as 1500 AD.

1753 – Recognition as an element: French chemist Claude-François Geoffroy provided definitive proof that bismuth was a unique element, distinct from lead and tin.

Biological Role of Bismuth

Bismuth has no known essential biological function. Unlike many other heavy metals, it is relatively non-toxic, which is why bismuth compounds are still safely used in medicines and consumer products.