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Mo
Molybdenum
95.95

Key Properties

Atomic Mass	95.95
Category	Transition Metals
State at 20°C	solid
Melting Point	2622°C
Boiling Point	4639°C
Density	10.28
Electron Config	[Kr] 4d5s1
Electronegativity	2.16
Year Discovered	1781
Discovered By	Carl Wilhelm Scheele

Did You Know?

- 1 It has one of the highest melting points of all pure elements, second only to tantalum and tungsten.
- 2 Its name comes from the Ancient Greek word 'molybdos', which means 'lead', because its ore was often mistaken for lead ore.
- 3 For a long time, the massive 14,000-pound ball in the iconic \
- 4 Molybdenum is an essential trace nutrient required by almost all forms of life to process nitrogen.
- 5 Molybdenum disulfide is a solid lubricant (similar to graphite) that can withstand high temperatures and pressures, used in heavy-duty greases.

APPEARANCE

Molybdenum is a hard, silvery-white metal.

SUPERHERO PERSONA

"The High-Temp Hero, a hero who can withstand extreme temperatures and gives steel its heat-resistant strength."

EVERYDAY CONNECTION

Molybdenum is found in high-strength steel tools in a workshop.

POP CULTURE

Molybdenum is depicted as a tough material used for spaceship armor in science fiction.

Molybdenum: The Super-Tough Metal

Molybdenum is a shiny, silver-gray metal with an incredibly high melting point. On its own it's hard and brittle, so it's usually made as a gray powder and then shaped into useful forms. The real value of molybdenum is in the way it makes other metals stronger and tougher.

Why Is Molybdenum Useful?

Molybdenum is all about boosting strength, hardness, and resistance to wear and corrosion.

Alloys: Most molybdenum is used in special steels, called moly steels. These are strong enough for heavy-duty jobs like car engines, drills, and saw blades.

Lubricants: Molybdenum disulfide (MoS₂) is super slippery. It's added to oils and greases to keep machines running smoothly, even under high heat and pressure.

Catalysts & Pigments: Molybdenum compounds are used to speed up chemical reactions in the petroleum industry, to make colorful pigments, and even in inks for circuit boards.

Molybdenum in Living Things

Even though too much molybdenum can be harmful, small amounts are essential for life. It's part of around 50 enzymes that help living things survive. For example, the enzyme nitrogenase—found in bacteria—uses molybdenum to turn nitrogen from the air into a form plants can use for growth.

Where It's Found & Its History

The main ore of molybdenum is molybdenite (MoS₂), found in countries like the USA, China, Chile, and Peru. To get pure molybdenum, the ore is heated to form an oxide, then reduced to metal. It's also recovered as a by-product when mining copper or tungsten.

Long Confused: Molybdenite was often mistaken for graphite (used in pencils) or lead ore.

Discovery (1778): Swedish chemist Carl Wilhelm Scheele showed it was actually a new element.

Isolation (1781): A few years later, Peter Jacob Hjelm managed to extract pure molybdenum metal for the first time.