

# Chemical Properties

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Molybdenum is a key alloying agent that increases the strength and resistance to corrosion of many quenched and tempered steels, especially at elevated temperatures. Additionally, the material is added to improve the performance of some heat and corrosion resistant nickel alloys. Moly has a wide variety of applications, including but certainly not limited to boiler plates, industrial tools, gun barrels, armor plate, vacuum furnaces, light bulbs, nuclear energy, missile, aircraft parts, and many more. In fact, most high strength steels consist of between 0.25% and 8% molybdenum. While the pure material is prized for its attributes, moly alloys such as lanthanated molybdenum (MoLa), molybdenum disulfide (MoS<sub>2</sub>), and titanium zirconium molybdenum (TZM) are also useful since they expand upon the core properties while widening the range of consumer and industrial applications. Below is a compilation of pure molybdenum's chemical properties. If you'd like to know more regarding your specialized application, feel free to give us a call, 1-800-626-0226 or email us at [sales@molybdenum.com](mailto:sales@molybdenum.com)!

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Element Classification: Transition Metal

Density (g/cc): 10.22

Melting Point (K): 2890

Boiling Point (K): 4885

Appearance: silvery white, hard metal

Atomic Radius (pm): 139

Atomic Volume (cc/mol): 9.4

Covalent Radius (pm): 130

Ionic Radius: 62 (+6e) 70 (+4e)

Specific Heat (@20°C J/g mol): 0.251

Fusion Heat (kJ/mol): 28

Evaporation Heat (kJ/mol): ~590

Debye Temperature (K): 380.00

Pauling Negativity Number: 2.16

First Ionizing Energy (kJ/mol): 684.8

Electron Configuration: [Kr] 5s<sup>1</sup> 4d<sup>5</sup>

Oxidation States: 6, 5, 4, 3, 2, 0

Lattice Structure: Body-Centered Cubic

Lattice Constant (Å): 3.150