

## Molybdenum ${}_{42}\text{Mo}^{95.94}$

Isolated in 1781 by P.J. Hjelm at Uppsala, Sweden.

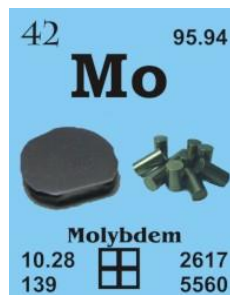
[Greek, molybdos = lead]

French: Molybdène

German: Molybdän

Italian: Molibdeno

Spanish: Molibdeno



Atomic number	42
Density in g/cm <sup>3</sup>	10.28
Atomic radius in pm	190
Atomic weight	95.94
Melting point in °C	2617
Boiling point in °C	5560

**Description:** Molybdenum is a lustrous, silvery metal which is fairly soft when pure. It is usually obtained as a grey powder. It is attacked slowly by acids. It is used in alloys, electrodes and catalysts.

### MOLYBDENUM SINGLE CRYSTAL PROPERTIES

<b>State:</b>	single crystal
<b>Crystal structure:</b>	bcc
<b>Production method:</b>	Floating Zone
<b>Standard size:</b>	diameter 8-12mm thickness 1-2mm
<b>Orientation:</b>	(100), (110) and (111)
<b>Orientation accuracy:</b>	<2°, <1°, <0.4° or <0.1°
<b>Polishing:</b>	as cut, one or two sides polished
<b>Roughness of surface:</b>	<0.03µm
<b>Purity:</b>	99.99%
	C 3
	H < 1
	O 9
	N < 5
	Cu 1.60
	Fe 1.80
	Ni < 1
	Pb 0.30
	Si 0.30
	Ga, Hf and Ta are below the detection limit
<b>Density:</b>	10.2 g/cm <sup>3</sup>
<b>Melting point:</b>	2616.85 °C / 2890 °K
<b>Boiling point:</b>	4611.85 °C / 4885 °K
<b>Molar volume:</b>	9.39 cm <sup>3</sup>
<b>Thermal conductivity:</b>	138 [300 K] Wm <sup>-1</sup> K <sup>-1</sup>
<b>Coefficient of linear thermal expansion:</b>	5.43 x 10 <sup>-6</sup> K <sup>-1</sup>
<b>Electrical resistivity:</b>	5.2x 10 <sup>-8</sup> [273 K] Wm

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<b>Mass magnetic susceptibility:</b>	+1.2 x 10 <sup>-8</sup> (s) kg-1m <sup>3</sup>
<b>Young's modulus:</b>	324.8 GPa
<b>Rigidity modulus:</b>	125.6 GPa
<b>Bulk modulus:</b>	261.2 GPa
<b>Poisson's ratio:</b>	0.293
<b>Radii:</b>	Mo6+ 62; Mo2+ 92; atomic 136; covalent 129
<b>Electronegativity:</b>	2.16 (Pauling); 1.30 (Allred); 3.9 eV (absolute)
<b>Effective nuclear charge:</b>	3.45 (Slater); 6.98 (Clementi); 9.95 (Froese-Fischer)
<b>Number of Isotopes (incl. nuclear isomers):</b>	23
<b>Isotope mass range:</b>	88 -> 106
<b>Crystal structure, (cell dimensions / pm), space group</b>	bcc
<b>X-ray diffraction: mass absorption coefficients:</b>	CuK $\alpha$ 162 ( $\mu/r$ ) / cm <sup>2</sup> g <sup>-1</sup> MoK $\alpha$ 18.4 ( $\mu/r$ ) / cm <sup>2</sup> g <sup>-1</sup>
<b>Neutron scattering length:</b>	0.6715 b/10 <sup>-12</sup> cm
<b>Thermal neutron capture cross-section:</b>	2.60 sa / barns

