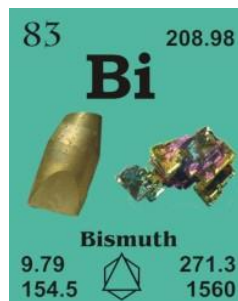


Bismuth ${}_{83}\text{Bi}^{208.980}$

Known in the fifteenth century, discoverer unknown.

French: bismuth
German: Bismut
Italian: bismuto
Spanish: bismuto



Atomic number	83
Density in g/cm ³	9.79
Atomic radius in pm	143
Atomic weight	208.98
Melting point in °C	271.3
Boiling point in °C	1560

Description: Bismuth is a brittle metal with a silvery lustre and an pink tinge. It is stable to oxygen and water, but dissolves in concentrated HNO₃. Bismuth is used in alloys, pharmaceuticals, electronics, catalysts, cosmetics and pigments. The metal expands on solidification.

BISMUTH SINGLE CRYSTAL PROPERTIES

State:	Single crystal
Crystal structure:	rhombohedral
Production method:	Bridgman
Standard size:	diameter 12mm thickness 1-2mm
Orientation:	(100), (110) and (111)
Orientation accuracy:	<2°, <1°, <0.4° or <0.1°
Polishing:	as cut, one or two sides polished
Roughness of surface:	<0.03 μm
Purity:	99.999%
	C 3
	H < 1
	O 9
	N < 5
Typical analysis (ppm):	Cu 1.60
	Fe 1.80
	Ni < 1
	Pb 0.30
	Si 0.30
	Ga, Hf and Ta are below the detection limit
Crystal structure:	(cell dimensions/pm), space group, rhombohedral (a=454.950, c=1186.225), R3m
X-ray diffractions mass absorption coefficients:	CuKα 240 (μ/r) / cm ² g ⁻¹ MoKα 120 (μ/r) / cm ² g ⁻¹
Neutron scattering length:	0.8533 b/10 ⁻¹² cm
Thermal neutron capture cross-section:	0.034 sa / barns

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Density:	9,8 g/cm ⁻³ [293 K]; 2390 [liquid at m.p.]
Melting point:	271.35 °C / 544.5 °K
Boiling point:	1609.85±5 °C / 1883±5 °K
Molar volume:	21.44 cm ³
Thermal conductivity:	7.87 [300 K] Wm ⁻¹ K ⁻¹
Coefficient of linear thermal expansion:	13.4 x 10 ⁻⁶ K ⁻¹
Electrical resistivity:	106.8x10 ⁻⁸ [293 K] Wm
Mass magnetic susceptibility:	-1684 x 10 ⁻⁹ (s) kg ⁻¹ m ³
Young's modulus:	34.0 GPa
Rigidity modulus:	12.8 GPa
Bulk modulus:	n.a.
Poisson's ratio:	0.33
Radi:	Bi ⁵⁺ 74; Bi ³⁺ 96; atomic 155; covalent 152; van der Waals 240
Electronegativity:	2.02 (Pauling); 1.67 (Allred); 4.69 eV (absolute)
Effective nuclear charge:	6.30 (Slater); 13.34 (Clementi); 16.90 (Froese-Fischer)
Number of Isotopes (incl. nuclear isomers):	37
Isotope mass range:	189 -> 215

