Periodic Table of Elements

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Boron

Boron is found in the common mineral borax, but is rarely seen in pure form, as in these polycrystalline lumps. While extremely hard, boron is too brittle in pure form to have any practical applications.

01. OVERVIEW

Symbol	B
Atomic number	5
Atomic weight	10.81
Density	2.46 g/cm³
Melting point	2075 °C
Boiling point	4000 °C

02. THERMAL PROPERTIES

Phase	Solid
Melting point	2075 °C
Boiling point	4000 °C
Absolute melting point	2348 K
Absolute boiling point	4273 K
Critical pressure	N/A
Critical temperature	N/A
Heat of fusion	50 kJ/mol
Heat of vaporization	507 kJ/mol
Heat of combustion	N/A
Specific heat	1030 J/(kg K)
Adiabatic index	N/A
Neel point	N/A
Thermal conductivity	27 W/(m K)
Thermal expansion	6×10^{-6} K^{-1}

03. PHYSICAL PROPERTIES

Density	2.46 g/cm^3
Density (liquid)	2.08 g/cm^3
Molar volume	4.3943×10^{-6}
Molar mass	10.811 u
Brinell hardness	N/A
Mohs hardness	9.3 MPa
Vickers hardness	49000 MPa
Bulk modulus	320 GPa
Shear modulus	N/A
Young modulus	N/A
Poisson ratio	N/A
Refractive index	N/A
Speed of sound	1.62×104 m/s
Thermal conductivity	27 W/(m K)
Thermal expansion	6×10^{-6} K^{-1}

04. REACTIVITY

Valence	3
Electronegativity	2.04
Electron affinity	26.7 kJ/mol
Ionization energies	800.6, 2427.1, 3659.7, 25025.8, 32826.7 kJ/mol

05. SAFETY

Autoignition point	N/A
Flashpoint	N/A
Heat of combustion	N/A

06. CLASSIFICATIONS

Alternate names	N/A
Names of allotropes	Alpha Rhombohedral, Beta Rhombohedral, Alpha Tetragonal
Block, Group, Period	p, 13, 2
Electron configuration	[He]2s^{2}2p^1
Color	Black
Discovery	1808 in France and United Kingdom
Gas phase	N/A

07. ELECTRICAL PROPERTIES

Electrical type	Insulator
Electrical conductivity	0.0001 S/m
Resistivity	10000 m Ω
Superconducting point	N/A

08. MAGNETIC PROPERTIES

Magnetic type	Diamagnetic
Curie point	N/A
Mass magnetic susceptibility	-8.7×10^{-9} m^3/Kg
Molar magnetic susceptibility	-9.41×10^{-11} m^3/mol
Volume magnetic susceptibility	-0.0000214

09. ABUNDANCES

In universe	1×10^{-7}%
In sun	2×10^{-7}%
In meteorites	0.00%
In earth's crust	0.00%
In oceans	0.00%
In humans	0.00%

10. ATOMIC DIMENSIONS AND STRUCTURE

Atomic radius	87 pm
Covalent radius	82 pm
Van der Waals radius	N/A
Crystal structure	Simple trigonal
Lattice angles	1.01334, 1.01334, 1.01334
Lattice constants	506, 506, 506 pm
Space group name	R_ 3m
Space group number	166

11. NUCLEAR PROPERTIES

Half-Life	Stable
Lifetime	Stable
Decay mode	N/A
Quantum numbers	$^{2}P_{1}/_{2}$
Neutron cross section	755
Neutron mass absorption	2.4
Known Isotopes	^{6}B, ^{7}B, ^{8}B, ^{9}B, ^{10}B, ^{11}B, ^{12}B, ^{13}B, ^{14}B, ^{15}B, ^{16}B, ^{17}B, ^{18}B, ^{19}B
Stable Isotopes	^{10}B, ^{11}B
Isotopic Abundances	^{10}B - 19.9%, ^{11}B - 80.1%