

OVERVIEW

Full Name	Cobalt (None)
Symbol	Co
Atomic Number	27
Series	Transition Metal
Block / Group / Period	d-block Group 9 Period 4
Electron Config.	[Ar]4s23d7
Phase at STP	Solid
Colour	Gray
Discovery	1735 in Sweden

THERMAL PROPERTIES

Melting Point	1495 °C	°C
Melting Point (abs.)	1768 K	K
Boiling Point	2927 °C	°C
Boiling Point (abs.)	3200 K	K
Heat of Fusion	16.2 kJ/mol	kJ/mol
Heat of Vaporization	375 kJ/mol	kJ/mol
Specific Heat (solid)	421 J/(kg K)	J/(kg·K)
Thermal Conductivity	100 W/(m K)	W/(m·K)
Thermal Expansion	0.00013 K⁻¹	K ⁻¹

MECHANICAL PROPERTIES

Density (solid, STP)	8.9 g/cm³	g/cm ³
Density (liquid, MP)	7.75 g/cm³	g/cm ³
Young's Modulus	209 GPa	GPa
Shear Modulus	76 GPa	GPa
Bulk Modulus	180 GPa	GPa
Poisson's Ratio	0.31	
Speed of Sound	4720 m/s	m/s
Mohs Hardness	5	
Vickers Hardness	1043 MPa	MPa
Brinell Hardness	700 MPa	MPa

ELECTRICAL PROPERTIES

Type	Conductor
Conductivity	1.7×10⁷ S/m S/m
Resistivity	6.000000000002×10⁻⁸ Ω·m Ω·m

MAGNETIC PROPERTIES

Type	Ferromagnetic
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REACTIVITY

Valence	4
Electronegativity	1.88 (Pauling)
Electron Affinity	63.7 kJ/mol kJ/mol
Ionization Energies	760.4, 1648 kJ/mol

ATOMIC DIMENSIONS

Atomic Radius	152 pm	pm
Covalent Radius	126 pm	pm

CRYSTAL STRUCTURE

Structure	Simple Hexagonal
Lattice Constant	250.71, 250.71, 406.95 pm
Space Group	P63/mmc #194

ISOTOPES & NUCLEAR

Stability	Stable
Stable Isotopes	59Co
Isotopic Abundance	59Co 100%
Known Isotopes	47Co ■ 75Co (29 total)
Neutron Cross Sect.	37.2 barns

ELEMENTAL ABUNDANCES

Universe	0.0003%	%
Earth's Crust	0.003%	%
Oceans	8×10⁻⁹%	%
Human Body	2×10⁻⁶%	%

HEALTH & SAFETY

DOT Hazard Class	4.1
RTECS Number	GF8750000
NFPA Health/Fire/Rx	0 / 0 / 0