

OVERVIEW

Full Name	Tantalum (None)
Symbol	Ta
Atomic Number	73
Series	Transition Metal
Block / Group / Period	d-block Group 5 Period 6
Electron Config.	[Xe]6s24f145d3
Phase at STP	Solid
Colour	Gray
Discovery	1802 in Sweden

THERMAL PROPERTIES

Melting Point	3017 °C	°C
Melting Point (abs.)	3290 K	K
Boiling Point	5458 °C	°C
Boiling Point (abs.)	5731 K	K
Heat of Fusion	36 kJ/mol	kJ/mol
Heat of Vaporization	736 kJ/mol	kJ/mol
Specific Heat (solid)	140 J/(kg K)	J/(kg·K)
Thermal Conductivity	57 W/(m K)	W/(m·K)
Thermal Expansion	6.3×10 ⁻⁶ K ⁻¹	K ⁻¹

MECHANICAL PROPERTIES

Density (solid, STP)	16.65 g/cm ³	g/cm ³
Density (liquid, MP)	15 g/cm ³	g/cm ³
Young's Modulus	186 GPa	GPa
Shear Modulus	67 GPa	GPa
Bulk Modulus	200 GPa	GPa
Poisson's Ratio	0.34	
Speed of Sound	3400 m/s	m/s
Mohs Hardness	6.5	
Vickers Hardness	873 MPa	MPa
Brinell Hardness	800 MPa	MPa

ELECTRICAL PROPERTIES

Type	Conductor
Conductivity	7.7×10 ⁶ S/m S/m
Resistivity	1.3×10 ⁻⁷ m ² / Ohm·m
Superconducting Pt.	4.47 K

MAGNETIC PROPERTIES

Type	Paramagnetic
Vol. Susceptibility	0.0001782
Mass Susceptibility	1.07×10 ⁻⁸ m ³ /Kg m ³ /kg

REACTIVITY

Valence	5
Electronegativity	1.5 (Pauling)
Electron Affinity	31 kJ/mol kJ/mol
Ionization Energies	761, 1500 kJ/mol

ATOMIC DIMENSIONS

Atomic Radius	200 pm pm
Covalent Radius	170 pm pm

CRYSTAL STRUCTURE

Structure	Body-centered Cubic
Lattice Constant	330.13, 330.13, 330.13 pm
Space Group	Im_3m #229

ISOTOPES & NUCLEAR

Stability	Stable
Stable Isotopes	181Ta
Isotopic Abundance	181Ta99.988%
Known Isotopes	155Ta ■ 190Ta (36 total)
Neutron Cross Sect.	20.5 barns

ELEMENTAL ABUNDANCES

Universe	8×10 ⁻⁹ %	%
Earth's Crust	0.00017%	%
Oceans	2×10 ⁻¹⁰ %	%

HEALTH & SAFETY

DOT Hazard Class	4.1
RTECS Number	WW5505000
NFPA Health/Fire/Rx	0 / 0 / 0