

Dysprosium ${}_{66}\text{Dy}^{162.50}$

Discovered in 1886 by Paul-Emile Lecoq de Boisbaudran at Paris, France.

[Greek: dysprositos = hard to obtain]

French: dysprosium

German: dysprosium

Italian: disprosio

Spanish: disprosio

66 162.50
Dy
Dysprosium
8.559 1407
178.1 2562

Atomic number	66
Density in g/cm ³	8.559
Atomic radius in pm	228
Atomic weight	162.50
Melting point in °C	1407
Boiling point in °C	2562

Description: Dysprosium is a hard, silvery metal of the so-called rare earth group (more correctly termed the lanthanides). It is oxidised by oxygen, reacts rapidly with cold water, and dissolves in acids. Dysprosium is used in alloys for making magnets.

DYSPROSIUM SINGLE CRYSTAL PROPERTIES

State:	Single crystal
Crystal structure:	hexagonal
Production method:	Floating zone
Standard size:	diameter 7-8mm thickness 1mm
Orientation:	(0001)
Orientation accuracy:	<2°, <1°, <0.4° or <0.1°
Polishing:	as cut, one or two sides polished
Roughness of surface:	<0.03 μm
Purity:	99.99%
Crystal structure:	(cell dimensions/pm), space group, Orthorhombic (a=359.5, b=618.3, c=567.7), Cmcm h.c.p. (a=359.03, c=564.75), P63/mmc b.c.c. (a=398), Im3m T(orthorhombic -> h.c.p.) = 86 K high pressure form: (a=334, c=245), R3m
X-ray diffractions mass absorption coefficients:	CuKα 286 (μ/ρ) / cm ² g ⁻¹ MoKα 70.6 (μ/ρ) / cm ² g ⁻¹
Neutron scattering length:	1.69 b/10-12 cm
Thermal neutron capture cross-section:	920 σ _a / barns
Density:	8.54 kg/m ⁻³ [293 K]; 2390 [liquid at m.p.]
Melting point:	1411.85 °C / 1685 °K
Boiling point:	2561.85 °C / 2835 °K
Molar volume:	19.00 cm ³
Thermal conductivity:	10.7 [300 K] Wm ⁻¹ K ⁻¹

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Coefficient of linear thermal expansion:	10.0 x 10 ⁻⁶ K ⁻¹
Electrical resistivity:	57.0x10 ⁻⁸ [293 K] Ωm
Mass magnetic susceptibility:	+8.00 x 10 ⁻⁶ (s) kg ⁻¹ m ³
Young's modulus:	61.4 GPa
Rigidity modulus:	24.7 GPa
Bulk modulus:	40.5 GPa
Poisson's ratio:	0.247
Radi:	Dy ³⁺ 91; atomic 177; covalent 159
Electronegativity:	1.22 (Pauling); 1.10 (Allred); n.a. (absolute)
Effective nuclear charge:	2.85 (Slater); 8.34 (Clementi); 11.49 (Froese-Fischer)
Number of Isotopes (incl. nuclear isomers):	24
Isotope mass range:	147 -> 168

