

Stable isotopes of dysprosium available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Enrichment Level	Chemical Form
Dy-156	66	90	155.92428	0.06%	18.00-20.70%	Oxide
Dy-158	66	92	157.924405	0.10%	14.10-23.70%	Oxide
Dy-160	66	94	159.925194	2.34%	67.70-70.10%	Oxide
Dy-161	66	95	160.926930	18.90%	92.20-93.50%	Oxide
Dy-162	66	96	161.926795	25.50%	>94.70%	Oxide
Dy-163	66	97	162.928728	24.90%	>94.50%	Oxide
Dy-164	66	98	163.929171	28.20%	95.90-98.45%	Oxide



Dysprosium was discovered in 1886 by Paul-Émile Lecoq de Boisbaudran. Its name originates with the Greek word *dysprositos*, meaning "hard to obtain."

Dysprosium is a silvery, noncorrosive metal with hexagonal crystals; the metal is soft enough to be cut with a knife, and it can be machined without sparking, if overheating is avoided. Dysprosium does not react with moist air to form hydroxide. It reacts slowly with water and halogen gases and is soluble in dilute acids. At ordinary temperatures, it is relatively stable in air; however, when heated with oxygen, it forms dysprosium sesquioxide. With halogens, it reacts slowly at room temperature, forming dysprosium trihalides. It combines with several nonmetals at high temperatures, forming binary compounds with varying compositions. It dissolves in most mineral acids, with the evolution of hydrogen.

Commercial applications of dysprosium include laser materials and commercial lighting; neutron-absorbing control rods in nuclear reactors; data storage applications such as hard disks; magnets for use in hybrid electric vehicle motors; use in dosimeters for measuring ionizing radiation; and metal-halide lamps.

In addition to being an explosion hazard (sparking fires that cannot be extinguished with water), dysprosium has low acute toxicity. Its soluble salts exhibit low toxicity in experimental animals when administered by intravenous route, with effects including degeneration of the liver and spleen.

Properties of Dysprosium

Name	Dysprosium
Symbol	Dy
Atomic number	66
Atomic weight	162.50
Standard state	Solid at 298 °K
CAS Registry ID	7429-91-6
Group in periodic table	N/A
Group name	Lanthanoid
Period in periodic table	6 (Lanthanoid)
Block in periodic table	f-block
Color	Silvery white
Classification	Metallic
Melting point	1411 °C
Boiling point	2562 °C
Thermal conductivity	10.70 W/(m·K) at 298.2 °K
Electrical resistivity	57.00 $\mu\Omega\cdot\text{cm}$ at 25 °C
Electronegativity	1.22
Specific heat	167 J/kg K
Heat of vaporization	280 kJ·mol ⁻¹
Heat of fusion	11.10 kJ·mol ⁻¹
Density of liquid	8.37 g/cm ³ at 1411 °C
Density of solid	8.56 g/cm ³
Electron configuration	[Xe]4f ⁹ 5d ¹ 6s ²
Atomic volume	19.032 cm ³ /g atom
Atomic radius	1.773 Å
Ionic radius	0.908 Å
Most common oxidation state	+3