

Stable isotopes of erbium available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Enrichment Level	Chemical Form
Er-162	68	94	161.928775	0.14%	28.20-39.20%	Oxide
Er-164	68	96	163.929197	1.61%	51.30-75.30%	Oxide
Er-166	68	98	165.930290	33.60%	94.70-98.10%	Oxide
Er-167	68	99	166.932046	22.95%	95.30-96.30%	Oxide
Er-168	68	100	167.932368	26.80%	>98.00%	Oxide
Er-170	68	102	169.935461	14.90%	97.70-98.20%	Oxide

68

Er

Erbium was discovered in 1842 by Carl G. Mosander. It is named for the village of Ytterby, near Vaxholm, Sweden.

A soft, malleable solid with metallic luster, erbium has hexagonal, close-packed crystals. Its salts are pink to red, while it forms a dark-grey powder. In lump form, the metal is stable at ordinary temperatures, and it ignites in air in its finely-divided state. It has an effective magnetic moment of 9.9 Bohr magnetons at 25 °C (it is paramagnetic, changing to antiferromagnetic at -189 °C and to ferromagnetic at -253 °C). It is insoluble in water and soluble in acids. In aqueous solution, erbium is always trivalent, Er³⁺. It forms water-insoluble trivalent salts; evaporation of solutions generally yields hydrated salts. The metal reacts with acids, forming corresponding salts and liberating hydrogen. When heated in oxygen or air, the metal (in lump form) slowly oxidizes, forming erbium sesquioxide.

Erbium's principal uses involve its pink-colored Er³⁺ ions, which have optical fluorescent properties that are useful in certain laser applications. Erbium-doped glasses or crystals can be used as optical amplification media. Erbium ion emissions are also helpful in laser surgery and in certain types of laser dentistry. Erbium is also used as a photographic filter and a metallurgic additive. It can be used as a colorant for glass, cubic zirconia and porcelain. It is used in neutron-absorbing control rods, cryocoolers and (in salt form) to help stimulate metabolism in humans.

Properties of Erbium

Name	Erbium
Symbol	Er
Atomic number	68
Atomic weight	167.26

Properties of Erbium (continued)

Standard state	Solid at 298 °K
CAS Registry ID	7440-52-0
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	1529 °C
Boiling point	2863 °C
Vaporization point	2863 °C
Thermal conductivity	14.5 W/(m·K) at 298.2 °K
Electrical resistivity	107.0 $\mu\Omega\cdot\text{cm}$ at 25 °C; 205 $\mu\Omega\cdot\text{cm}$ at 1000 °C
Electronegativity	1.2
Specific heat	0.168 J/g mol at 20 °C
Heat of vaporization	285 kJ·mol ⁻¹
Heat of fusion	19.9 kJ·mol ⁻¹
Density of liquid	8.86 g/cm ³
Density of solid	9.07 g/cm ³ near room temperature
Electron configuration	[Xe]4f ¹¹ 5d ¹ 6s ²
Atomic radius	1.758 Å (coordination number 12)
Atomic volume	18.49 cm ³ /mol
Oxidation states	+2, +3