

Erbium

Er

General Information

Discovery

Erbium was discovered by C.G. Mosander in 1842 in Stockholm, Sweden. It was first produced in reasonably pure form in 1934 by Klemm and Bonner.

Appearance

Erbium is a silver-grey metal, and is soft and malleable.

Source

Erbium is found principally in the minerals monazite and bastnaesite, from which it can be extracted by ion exchange and solvent extraction.

Uses

Erbium is occasionally used in infra-red absorbing glass. Added to vanadium, it lowers the hardness and improves the workability. Otherwise it is little used.

Biological Role

Erbium has no known biological role, and has low toxicity.

General Information

Erbium slowly tarnishes in air, reacts slowly with water and reacts with acids.

Physical Information

Atomic Number	68
Relative Atomic Mass ($^{12}\text{C}=12.000$)	167.26
Melting Point/K	1802
Boiling Point/K	3136
Density/kg m ⁻³	9066 (298K)
Ground State Electron Configuration	[Xe]4f ¹² 6s ²
Electron Affinity (M-M ⁻)/kJ mol ⁻¹	-50

Key Isotopes

Nuclide	¹⁶² Er	¹⁶⁴ Er	¹⁶⁶ Er	¹⁶⁷ Er	¹⁶⁸ Er	¹⁶⁹ Er
Atomic mass	161.9	163.9	165.9	166.9	167.9	
Natural abundance	0.14%	1.56%	33.4%	22.9%	27.1%	0%
Half-life	stable	stable	stable	stable	stable	9.4 days
Nuclide	¹⁷⁰ Er	¹⁷¹ Er				
Atomic mass	169.9					
Natural abundance	14.9%	0%				
Half-life	stable	7.52 h				

Ionisation Energies/kJ mol⁻¹

M - M ⁺	588.7
M ⁺ - M ²⁺	1151
M ²⁺ - M ³⁺	2194
M ³⁺ - M ⁴⁺	4115
M ⁴⁺ - M ⁵⁺	
M ⁵⁺ - M ⁶⁺	
M ⁶⁺ - M ⁷⁺	
M ⁷⁺ - M ⁸⁺	
M ⁸⁺ - M ⁹⁺	
M ⁹⁺ - M ¹⁰⁺	

Other Information

Enthalpy of Fusion/kJ mol ⁻¹	17.2
Enthalpy of Vaporisation/kJ mol ⁻¹	280
Oxidation States	
Er ⁺³	