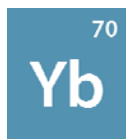


Stable isotopes of ytterbium available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Enrichment Level	Chemical Form
Yb-168	70	98	167.933895	0.13%	35.00-87.00%	Oxide
Yb-170	70	100	169.934758	3.05%	>70.00%	Oxide
Yb-171	70	101	170.936323	14.30%	95.00-97.50%	Oxide
Yb-172	70	102	171.936378	21.90%	>98.00%	Oxide
Yb-173	70	103	172.938207	16.12%	>92.00%	Oxide
Yb-174	70	104	173.938858	31.80%	>99.00%	Oxide
Yb-176	70	106	175.942569	12.70%	>99.60%	Oxide



Ytterbium was discovered in 1878 by Jean de Marignac. It is named after the village of Ytterby, near Vaxholm, Sweden.

Ytterbium is a silvery, lustrous metal that is soft, malleable and ductile. The metal exists in two allotropic forms: an *alpha form*, which has a face-centered cubic structure and a density of 6.98 g/cm³ and is stable at room temperature; and a *beta form*, with a body-centered cubic modification and a density of 6.54 g/cm³. The beta form appears when the alpha form is heated to 798 °C. Ytterbium reacts slowly with water and is soluble in dilute acids and liquid ammonia. It reacts with oxygen above 200 °C. It forms two oxides: a monoxide and a more stable sesquioxide. The metal dissolves in dilute and concentrated mineral acids. Similar to other rare earth metals, ytterbium is corroded slowly at ordinary temperatures by caustic alkalis, ammonium hydroxide and sodium nitrate solutions. The metal also dissolves in liquid ammonia, forming a deep blue solution. Reactions with halogens are slow at room temperature but progress rapidly above 200 °C, forming ytterbium trihalides. At elevated temperatures, ytterbium forms many binary, metalloid and intermetallic compounds with a number of elements.

Ytterbium metal has very little commercial use. In elemental form it is a laser source, a portable x-ray source, and a dopant in garnets. When added to stainless steel, it improves grain refinement, strength and other properties. Some other applications include carbon rods for industrial lighting, titanate-insulated capacitors, and additives to glass. The radioactive isotope Ytterbium-169 is used in portable devices to examine defects in thin steel and aluminum. The metal and its compounds are used in fundamental research.

Properties of Ytterbium

Name	Ytterbium
Symbol	Yb
Atomic number	70
Atomic weight	173.04
Standard state	Solid at 298 °K
CAS Registry ID	7440-64-4
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	824 °C
Boiling point	1194 °C
Vaporization point	1194 °C
Thermal conductivity	34.90 W/(m·K) at 298.2 °K
Electrical resistivity	25.00 μΩ·cm at 25 °C
Electronegativity	1.1
Specific heat	0.30 kJ/kg K
Heat of vaporization	160 kJ·mol ⁻¹
Heat of fusion	7.70 kJ·mol ⁻¹
Density of liquid	6.21 g/cm ³ at 824 °C
Density of solid	6.97 g/cm ³
Electron configuration	[Xe]4f ¹⁴ 6s ²
Atomic radius	1.945 Å
Ionic radius	Yb ³⁺ : 0.868 Å (coordination number 6) and 0.98 Å (coordination number 8)
Oxidation states	+2, +3