

Indium

In

General Information

Discovery

Indium was discovered by F. Reich and H. Richter in 1863 in Freiberg, Germany

Appearance

Indium is a very soft, silvery-white metal with a brilliant lustre.

Source

Indium is often associated with zinc minerals and iron, lead and copper ores. It is commercially produced from the zinc minerals, usually as a by-product.

Uses

Indium has semiconductor uses in transistors, thermistors and photoconductors. It is also used to make low-temperature alloys; for example, an alloy of 24% indium-76% gallium is liquid at room temperature. Indium can also be plated on to metal and evaporated on to glass to give a mirror with better resistance to corrosion than silver. A tiny long-lived indium battery has been devised to power new electronic watches.

Biological Role

Indium has no known biological role but has been shown to cause birth defects in unborn children. It has low toxicity.

General Information

Indium is stable in air and with water, but reacts with acids.

Physical Information

Atomic Number	49
Relative Atomic Mass (¹² C=12.000)	114.82
Melting Point/K	429
Boiling Point/K	2353
Density/kg m ⁻³	7310 (298K)
Ground State Electron Configuration	[Kr]4d ¹⁰ 5s ² 5p ¹
Electron Affinity (M-M ⁻)/kJ mol ⁻¹	-34

Key Isotopes

Nuclide	¹¹¹ In	¹¹³ In	¹¹⁵ In
Atomic mass		112.9	114.9
Natural abundance	0%	4.3%	95.7%
Half-life	2.81 days	stable	6x10 ¹⁴ yrs

Ionisation Energies/kJ mol⁻¹

M - M ⁺	558.3
M ⁺ - M ²⁺	1820.6
M ²⁺ - M ³⁺	2704
M ³⁺ - M ⁴⁺	5200
M ⁴⁺ - M ⁵⁺	7400
M ⁵⁺ - M ⁶⁺	9500
M ⁶⁺ - M ⁷⁺	11700
M ⁷⁺ - M ⁸⁺	13900
M ⁸⁺ - M ⁹⁺	17200
M ⁹⁺ - M ¹⁰⁺	19700

Other Information

Enthalpy of Fusion/kJ mol ⁻¹	3.27
Enthalpy of Vaporisation/kJ mol ⁻¹	231.8

Oxidation States

Main	In ⁺³
Others	In ⁺¹ , In ⁺²