

## **General Information**

### **Discovery**

Zinc was known in India and China before 1500.

### **Appearance**

Zinc is a bluish-white, lustrous metal.

### **Source**

Zinc is found in several ores, the principal ones being zinc blende, calamine and marmatite.

Commercially, zinc is obtained from its ores by concentrating and roasting the ore, then reducing it to zinc thermally with carbon or by electrolysis.

### **Uses**

Zinc is used in alloys such as brass, nickel silver and aluminium solder. Large quantities of zinc are used to produce die-castings which are important in the automobile, electrical and hardware industries. It is also used extensively to galvanise other metals such as iron to prevent rusting.

Zinc oxide is widely used in the manufacture of very many products such as paints, rubber, cosmetics, pharmaceuticals, plastics, inks, soaps, batteries, textiles and electrical equipment.

Zinc sulphide is used in making luminous dials and fluorescent lights.

### **Biological Role**

Zinc is an essential trace element which is non-toxic but carcinogenic in excess. When freshly-formed zinc (II) oxide is inhaled a disorder called the "oxide shakes" or "zinc chills" can occur.

### **General Information**

Zinc reacts with both acids and alkalis. It tarnishes in air. It is brittle at normal temperatures but malleable at 100-150K. It is a fair conductor of electricity, and burns in air at high red heat with the evolution of white clouds of the oxide.

## Physical Information

Atomic Number	30
Relative Atomic Mass ( $^{12}\text{C}=12.000$ )	65.39
Melting Point/K	692.7
Boiling Point/K	1180
Density/kg m <sup>-3</sup>	7133 (293K)
Ground State Electron Configuration	[Ar]3d <sup>10</sup> 4s <sup>2</sup>
Electron Affinity (M-M <sup>-</sup> )/kJ mol <sup>-1</sup>	9

## Key Isotopes

Nuclide	<sup>64</sup> Zn	<sup>65</sup> Zn	<sup>66</sup> Zn	<sup>67</sup> Zn	<sup>68</sup> Zn	<sup>70</sup> Zn
Atomic mass	63.929	64.926	65.926	66.927	67.925	69.925
Natural abundance	48.6%	0%	27.9%	4.1%	18.8%	0.6%
Half-life	stable	243.6 days	stable	stable	stable	stable

## Ionisation Energies/kJ mol<sup>-1</sup>

M - M <sup>+</sup>	906.4
M <sup>+</sup> - M <sup>2+</sup>	1733.3
M <sup>2+</sup> - M <sup>3+</sup>	3832.6
M <sup>3+</sup> - M <sup>4+</sup>	5730
M <sup>4+</sup> - M <sup>5+</sup>	7970
M <sup>5+</sup> - M <sup>6+</sup>	10400
M <sup>6+</sup> - M <sup>7+</sup>	12900
M <sup>7+</sup> - M <sup>8+</sup>	16800
M <sup>8+</sup> - M <sup>9+</sup>	19600
M <sup>9+</sup> - M <sup>10+</sup>	23000

## Other Information

Enthalpy of Fusion/kJ mol<sup>-1</sup> 6.67

Enthalpy of Vaporisation/kJ mol<sup>-1</sup> 114.2

### Oxidation States:

Main Zn<sup>II</sup>

Others Zn<sup>I</sup>

### Covalent Bonds/kJ mol<sup>-1</sup>

Not applicable