COMETAL

Your Door to Raw Materials & Markets

Cobalt

Description

Cobalt is a ferromagnetic metallic element with atomic number Z = 27. It resembles iron and nickel, both in its free and combined state. It is widely distributed in nature and it represents approximately 0.001% in weight of all igneous rocks of the Earth's crust, compared with 0.02% that nickel represents. Cobalt traces are found in many iron, nickel, copper, silver, manganese and zinc minerals, but cobalt ores which are commercially important are arsenides, oxides and sulphides.

There are several methods to obtain cobalt, depending on its concentration in the ore and its exact composition. They typically include a flotation process, followed by a heating step to convert the sulphurs into oxides, which must subsequently be reduced to metal. It can also be obtained as a secondary by-product of copper in production.

Properties

Physical Properties		Electronic Properties	
Name	Cobalt	Valence	2, 3
Atomic Number	27	Electro negativity	1.8
Symbol	Co	Covalent Radius	1.26
Atomic Weight	58.93	Ionic Radius	0.63
Density (g/ml)	8.9	Atomic Radius	1.25
Boiling Point ºC	2900	Atomic Structure	$[Ar]3d^7 4s^2$
Melting PointºC	1495	Ionization Potential (eV)	7.9

Cobalt resembles iron and nickel in terms of hardness, tensile strength, machinability, thermal and electrochemical behaviour. The metal is unaffected by water or air under normal conditions and it is quickly effected by sulphuric, hydrochloric and nitric acids, but hydrofluoric acid, ammonium hydroxide and sodium hydroxide effect it slowly. Cobalt has variable valence and form complex ions and coloured compounds, as all transition elements. Even at high temperatures, cobalt and its alloys are resistant to wear and corrosion.

Cobalt in finely divided powder form is flammable. Cobalt compounds must be handled with care due to its light metal toxicity. The Co-60 is radioactive and exposure to its radiation can cause cancer. Ingestion of Co-60 causes the accumulation of some amount in the tissues, which is very slowly eliminated afterwards.
Metallic cobalt is classified as a hazardous substance by the relevant EU Regulations (CLP):

- Resp. Sens. 1, H334
- Skin Sens. 1, H317
- Aquatic Chronic 4, H413

Cobalt is not classified as a hazardous good for transportation.

Uses

- Super alloys.
- High speed steels.
- Tool steel.
- Electrodes.
- Steel belts of tires.
- Magnets.

COMETAL, S.A.
• C/José Lázaro Galdiano 4
• 28036 Madrid (Spain)
• Tel: +34 91 4585980
• Fax: +34 91 4585987

• cometal@cometalsa.com
• www.cometalsa.com
• VAT Nr ESA28117026