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Bismuth

Description

Its symbol is Bi, is a scarce metallic chemical element, pinkish coloured. Its atomic number Z is 83 and is placed in group 15 of the periodic system. It ranks 73 in abundance among the elements of the earth's crust, with a proportion of 8.5 $x10^{-7}$% w/w and is as scarce as silver. The main deposits are in South America, usually obtained as a by-product of refining copper and lead concentrates.

Properties

Physical Properties		Electronic Properties	
Name	Bismuth	Valence	3, 5
Atomic Number	83	Electro negativity	2.02
Symbol	Bi	Covalent Radius	1.46
Atomic Weight	208.98	Ionic Radius	1.2
Density (g/ml)	9.8	Atomic Radius	1.7
Boiling Point ºC	1560	Atomic Structure	$[Xe]4f^{14}5d^{10}6s^{2}6p^{3}$
Melting Point ºC	271.3	Ionization Potential (eV)	7.29

Bismuth is a greyish white crystalline, lustrous, hard and breakable metal. It is one of the few metals that expands on its solidification. Its thermal conductivity is lower than any other metal, with the exception of mercury. The bismuth is inert to dry air at room temperature, but it slightly oxidizes in humid conditions. It forms rapidly an oxide film at temperatures above its melting point, and is ignites reaching the red condition forming the yellow oxide, Bi_2O_3. The metallic Bismuth combines directly with halogens and Sulphur, Selenium and Tellurium, but not with Nitrogen nor Phosphorus.

In almost all Bismuth compounds it is in trivalent form. However, it can sometimes be pentavalent. The sodium bismuthate, bismuth pentafluoride are perhaps the most important compounds of pentavalent Bi; the first is a powerful oxidizing agent and the latter a useful fluorinating agent for organic compounds.

Metallic Bismuth is neither classified as hazardous substance by the relevant EU Regulations nor is considered as dangerous goods for its transport.

Uses

- Low melting point alloys.
- Lead substitute for lead copper alloys in water pipes.
- Special welding.
- Bleaching effect in foundries.
- Pharmaceutical and cosmetic applications.

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