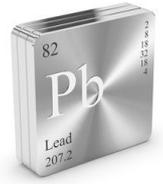


Lead



Description

Lead is a chemical element in the periodic table with atomic number $Z = 82$ whose symbol - Pb - comes from the Latin Plumbum. Lead is rarely found in its elemental state. It often occurs naturally as Lead sulphide or Galena (PbS). Other commercially important lead minerals are carbonates (Cerussite, $PbCO_3$) and sulphates (Anglesite, $PbSO_4$), phosphates (Pyromorphite, $Pb_5Cl(PO_4)_3$), vanadates (Vanadinite, $Pb_5Cl(VO_4)_3$), arsenates (Mimelite, $Pb_5Cl(AsO_4)_3$), chromates (Chrocoite, $PbCrO_4$) and molybdates (Vulferite, $PbMoO_4$). Tungstates (Stolzita, $PbWO_4$) are much less abundant.

Commercial ores may contain just up to 3% Lead, but the most common content in ores is about 10%. The ores are concentrated up to a content of 40% or more prior to using them commercially. Then a heating procedure of the ore is applied to obtain the lead oxide and a mixture of sulphates and silicates of all the impurities contained in the starting ore concentrate. Then a carbothermic reduction of the oxide to its metallic form follows this. Besides the Nickel isolates, the mentioned impurities can be recovered from the slag where they will be retained.

Properties

Physical Properties		Electronic Properties	
Name	Lead	Valence	2, 4
Atomic Number	82	Electro negativity	2.33
Symbol	Pb	Covalent Radius	1.47
Atomic Weight	207.19	Ionic Radius	1.20
Density (g/ml)	11.4	Atomic Radius	1.75
Boiling Point °C	1725	Atomic Structure	$[Xe]4f^{14}5d^{10}6s^26p^2$
Melting Point °C	327.4	Ionization Potential (eV)	7.416

Lead is a heavy, bluish silver coloured metal, which is tarnished to acquire a dull gray colour. It is flexible, inelastic and melts easily. Normal chemical valences are 2 and 4. It is relatively resistant to etching by sulphuric acid and hydrochloric acid, but it slowly dissolves in nitric acid and in the presence of nitrogen alkalis. Lead is amphoteric because it forms lead salts with acids, and metal salts with plumbic acid. Lead has the ability to form many salts, oxides and organometallic compounds.

Industrially, the most important compounds are the oxides of lead and tetraethyl lead. Lead forms alloys with many metals and is generally used in this way in most of its applications. All the lead alloys formed with tin, copper, arsenic, antimony, bismuth, cadmium and sodium have industrial importance.

Thanks to its excellent resistance to corrosion, lead finds an extensive use in construction, particularly in the chemical industry. It is resistant to attack by many acids, because it forms its own protective oxide coating.

It is stable under normal conditions of handling and warehousing. Lead metal is neither classified as a hazardous substance by the EU, nor as a hazardous good for transportation.

Uses

- Manufacturing of batteries.
- Cable insulation.
- Radiation shielding.
- Protection against corrosion in the form of lead tetroxide.
- Crystal glass.
- Element for alloyed steels.

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