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## **ABSOLUTE ZERO**

The lowest theoretical temperature. Value is  $-273.15^{\circ}\text{C}$ .

## **ANGLESITE**



## **ARGENTITE**

This is the ore of silver, also known as silver glance. Its formula is  $\text{Ag}_2\text{S}$ .

## **ASBESTOS**



## **ATMOSPHERE**

This comprises a blanket of gaseous layer around earth.

## **ATOMIC MASS**

It is the mass of an atom of a chemical element expressed in atomic mass unit (a.m.u) and it is approximately equivalent to the number of protons and neutrons in the atom and also known as mass number.

## **ATOMIC NUMBER**

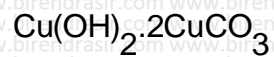
It is the number of protons in the nucleus of an atom, which is characteristic of a chemical element and determines its place in the periodic table. According to modern periodic law, the

properties of elements are periodic functions of their atomic numbers.

## ATOMIC RADIUS

Atomic radius is taken as the distance from the centre of the nucleus to the outermost shell of the electrons. As per probability concept an atom does not have well defined boundary. It is difficult to get the exact value of atomic radius. It can be found by distance of the closest approach of one atom to another atom in a given bonding situation.

## AZURITE



## BARYTE OR HEAVY SPAR



## BELL METAL

This is an alloy of composition Cu (80), Zn (20). It is used for bells.

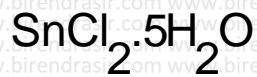
## BIOSPHERE

It refers to the domain of living organism in covalent with atmosphere hydrosphere as well as lithosphere.

## BORNITE

This is the ore of copper also known as peacock ore. Formula is  $\text{Cu}_5\text{FeS}_4$ .

## BUTTER OF IRON



## BRASS

This is an alloy of composition Cu (60 – 80), Zn (40 – 20). It is used in utensils.

## BRONZE

This is an alloy of composition Cu (70 – 90), Zn (10 – 30). It is used for statues, coins.

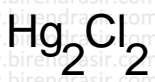


## CALCINATION

Calcination is the process of heating the ore (oxides, hydroxides, carbonates etc.). Moisture and volatile impurities are removed.



## CALOMEL



## CARNALLITE



## CAST IRON

Pig iron obtained from blast furnace by carbon reduction method. Cast iron is obtained by pouring pig iron directly into moulds of desired shape. Cast iron is very hard and brittle and can be used if it is not subjected to mechanical and thermal shock.

## CAUSTIC POTASH



## CAUSTIC SODA



## CHALCOCITE

This is the ore of copper also known as copper glance. Formula is  $\text{Cu}_2\text{S}$ .

## CHALCOPYRITE

This is the ore of copper. Formula is  $\text{CuFeS}_2$ .

## CHILE SALTPETRE

Sodium nitrate  $\text{NaNO}_3$  is known as Chile saltpetre.

## CIMONITE



## CINNABAR

PbS

## CONCENTRATION OF ORE

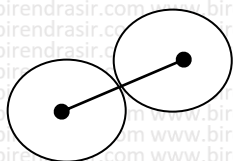
Metallic ores are often found mixed with rocky material like quartz, mica, silicates etc., and these impurities are called GANGUE. Before the ore is subjected to metallurgical process, it is necessary to remove these unwanted impurities mechanically. This operation is known as concentration of ore.

## CORROSIVE SUBLIMATE



## COVALENT RADIUS

It is one half of the distance between the nuclei of two covalently bonded atoms of the same element in a molecule.



## CUPRITE

This is the ore of copper also known as ruby red. Formula is  $\text{Cu}_2\text{O}$ .



## ELECTROMAGNETIC SEPARATION

This method is used when either the ore or the impurities are magnetic in nature e.g. Chromite ( $\text{FeCr}_2\text{O}_4$ ), magnetite ( $\text{Fe}_3\text{O}_4$ ) and Pyrolusite ( $\text{MnO}_2$ ) are all magnetic ores and are separated from their non – magnetic gangue by this process.

## ELECTRON AFFINITY



The electron affinity (EA) gives a measure of the tendency of an atom to change into an anion



Electron affinity is defined as the amount of energy released when an electron is added to a gaseous isolated atom or ion.

Following table has electron affinity values in electron volt (eV per atom) or kJ/mol.

The electron affinity can also be defined as energy required to remove an electron from a singly charged gaseous negative ion.

The greater the energy released in the process of taking up the extra electron, the greater is the electron affinity. The electron affinity of an atom measures the tightness with which it binds an additional electron to itself.

## **ELECTRONEGATIVITY**

The term electronegativity was introduced by Jons Jacob Berzelius in 1811. Even though the concept was known for long but accurate scale of electronegativity was not known. In 1934, Linus Pauling defined it as the property of an element, and is defined as the tendency of an atom to attract the shared pair of electrons (when covalent bond is formed).

For example, in a covalent molecule A-B, if A is more electronegative than B then A gets partial negative charge and B gets partial positive charge.

## **EPSOM SALT**



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## **FELDSPAR**



## **FROTH FLOTATION**

Metallic ores are often found mixed with rocky material like quartz, mica, silicates etc., and these impurities are called **GANGUE**. Before the ore is subjected to metallurgical process, it is necessary to remove these unwanted impurities mechanically. This operation is known as concentration of ore. Froth flotation is a concentration process which is based on principle of preferential wetting of the solid surface by liquids like metallic sulphides are wetted by certain oils (like pine oil not water). When finely divided ore is put in water along with small quantity of oil, froth is formed at the air-water interface and the wetted ore rises to the surface along with foam while Stoney matter (gangue) which is preferentially wetted by water and remains in water below the foam.



## **GANGUE**

Metallic ores are often found mixed with rocky material like quartz, mica, silicates etc., and these impurities are called **GANGUE**.

## **GERMAN SILVER**

It is an alloy of Cu – 50, Zn – 25, Ni – 57. It is used for resistance coils, ornaments.

## **GLAUBER'S SALT**



## GREEN VITRIOL



## GROUP IN PERIODIC TABLE

In chemistry, a group is a column of elements in the periodic table of chemical elements. There are 18 groups in the periodic table. Properties of elements of a group are similar.

## GYPSUM



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## HAEMOGLOBIN

The human body contains about 4 g of iron (Fe) and about 70% is found as haemoglobin, the red pigment in the red blood cells (erythrocytes). Most of the red is stored as ferretin. The function of haemoglobin is to pick up dioxygen at the lungs. Via arteries blood goes to different parts of the body where oxygen is required like muscles. Now oxygen is transferred to a myoglobin molecule and stored until oxygen is required to release energy from glucose sugar. When oxygen is removed from haemoglobin the it is replaced by  $\text{H}_2\text{O}$  and then protein part of haemoglobin absorbs  $\text{H}^+$  and helps to remove  $\text{CO}_2$  from tissues (as  $\text{CO}_2$  is converted into  $\text{HCO}_3^-$  and  $\text{H}^+$ ). The blood removes the more soluble  $\text{HCO}_3^-$  ions and the reduced haemoglobin removes  $\text{H}^+$ . The blood returns to heart through veins and then pumped to lungs and here  $\text{HCO}_3^-$  is converted back to  $\text{CO}_2$  and



excreted into air in the lungs and exhaled. When blood picks up dioxygen again the process is repeated.

## **HYDROMETALLURGY**

This is a method for obtaining metals from their ores. Hydrometallurgy is concerned with selective leaching of metallic compounds to form a solution from which the metals can be precipitated.

## **HYDROSPHERE**

This comprises about 96% of earth's surface & includes all sources of water like oceans rivers lakes, glaciers, ground water etc.

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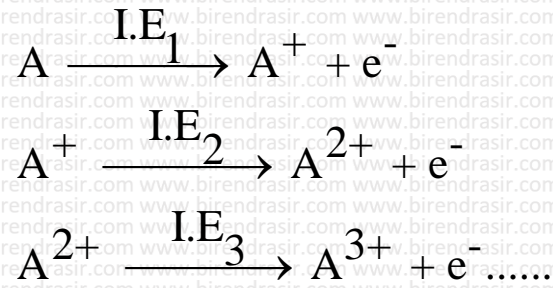
## **INDIAN SALTPETRE**

Potassium nitrate  $\text{KNO}_3$  is known as Indian saltpetre.

## **IONISATION ENERGY**

Ionisation energy of an element is defined as the amount of energy required to remove an electron from an isolated gaseous atom of that element resulting in the formation of a positive ion. The ionisation energy values are generally measured by spectroscopic techniques. Another method which can be used is to have the vapours of the element in a discharge tube and connect it to a source of current. At a certain voltage there will be sudden rise in the current passing through the tube. The energy corresponding to this voltage is known as **FIRST IONISATION ENERGY** ( $I.E_1$ ) and neutral atom  $A$  produces ion  $A^+$ . If the applied voltage is increased further, there can be again a stage when the current shows a

sudden rise, this is due to the elimination of another electron from each positively charged ion ( $A^+$ ) produced earlier. The energy corresponding to this stage is known as second ionisation energy ( $I.E_2$ ) and doubly charged ions  $A^{2+}$  are produced. If the potential is increased further there can be again sharp rises in the current at different points. These points correspond to the loss of three or more electrons and this way we get third ( $I.E_3$ ) or higher ionisation energies.



The ionisation energies can be measured in eV, J or kJ. Following table has successive ionisation energy values of elements in unit kJ/mol.



## LEACHING

This is an extractive metallurgy technique. This is used when ore is soluble and impurities are insoluble. This converts metals into soluble salts in aqueous medium.

## LEVIGATION

This is also called gravity separation or hydraulic washing where the lighter gangue particles are removed from heavier ore particles by washing in a current of water. It is generally used for oxide ores and carbonate ores. It is based on difference in densities of the ore particles and impurities.

## LITHARGE

PbO

## LITHOSPHERE

It refers to earth's solid crust containing the outer mineral cover. It comprises soil, minerals, organic matter etc.

## LUNAR CAUSTIC

AgNO<sub>3</sub>

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## MALACHITE

This is an ore of copper, also known as basic copper carbonate.

The formula is  $\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$ .

## MAGNESITE

MgCO<sub>3</sub>

## METALLURGY

The process of extracting metals from their ores is called metallurgy. Heavy metals such as copper, iron, zinc, lead, tin etc., are extracted from their ores by conventional ROASTING AND SMELTING processes. The active metals such as alkali metals, magnesium, calcium, aluminium etc., are obtained by ELECTROLYSIS of their chlorides, oxides or hydroxides in molten state. Noble metals such as silver and gold are extracted by amalgamation or the cyanide process.

## MYOGLOBIN

Myoglobin is similar to one of the units in the haemoglobin. It contains only one Fe atom and has a molecular weight of about 1700 and binds  $O_2$  more strongly than haemoglobin.



## PEARL ASH

Potash or potassium carbonate  $K_2CO_3$ .

## PERIOD IN PERIODIC TABLE

A period in the periodic table is a horizontal row of elements. In modern periodic table there are total 7 periods.

## PHILOSOPHER'S WOOL

$ZnO$

## PIG IRON

Iron obtained from blast furnace by carbon reduction method. It contains about 95% Fe, 4% C and varying quantities of other impurities.

## PLASTER OF PARIS

$CaSO_4 \cdot 1/2H_2O$

## POTASH MAGNESIS

$K_2SO_4 \cdot MgSO_4 \cdot 6H_2O$  is a double salt sold as fertiliser in the name of potash magnesia.



## QUICK LIME



CaO

R

## RED LEAD



## ROASTING

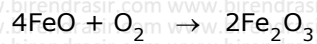
When concentrated (what is concentration?) ore (mainly sulphide) is heated in excess of air at high temperature the metal sulphide is oxidized to metal oxide.



Note: During roasting volatile impurities are removed.



Ferrous oxide is oxidised to ferric oxide.



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## SLAKED LIME



## SODA ASH



## SPINEL



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## TALC



## TURQUOISE

It is a popular gemstone (blue coloured and delicate veining),  
 $\text{CuAl}_6(\text{PO}_4)_4(\text{OH})_8 \cdot 4\text{H}_2\text{O}$ .



## van der Waal RADIUS

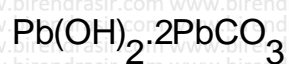
It is one half of the distance between the nuclei of two adjacent identical atoms belonging to two neighbouring molecules. The name Van der Waal radius is used because forces between molecules are Van der Waal force of attractions.

Note: Covalent radius of an atom is smaller than Van der Waal radius because in the formation of covalent bond atoms have to come closer to each other (force of attraction between atoms within the molecule is more than the force of attraction between molecules).

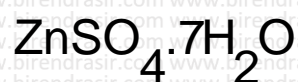
Note: For atoms of noble gases, we can find only Van der Waal radius. Because they do not form covalent bond.



## WHITE LEAD



## WHITE VITRIOL





# ZINC BLENDE

ZnS