

Some Important Chemical Compounds

1. Soaps

Sodium and potassium salt of higher fatty acids are called soaps. Saturated and unsaturated monocarboxylic acids are called fatty acids. Stearic acid ($C_{17}H_{35}COOH$). Palmitic acid ($C_{15}H_{31}COOH$) and Oleic acid ($C_{17}H_{33}COOH$) are main examples of fatty acids, which are found in nature. Sodium salt of fatty acids are called sodium soaps or hard soaps or washing soaps, whereas potassium soap is called bathing soap of soft soap.

2. Detergent

Chemically detergents are not soaps, but they have cleansing action similar to that of the soap. Therefore these are sometimes referred to as shapeless soaps. They are generally sodium salts of sulphate or sulphonates of higher alkanes. Some detergents are sodium alkyl sulphonates or sulphates

3. Glass

- Glass is an amorphous hard, brittle, super cooled liquid. It is not a true solid.
- Chemically glass is a mixture of number of silicates and has no definite formula. But the average composition can be represented as $xM_2O \cdot yM'O \cdot 6SiO_2$. Where M is monovalent alkali metal like Na, K, etc., M' is a bivalent metal like Ca, Zn, Pb, etc., and x, y are whole numbers.

4. Raw Materials

- The important raw material used for the manufacturing the glass are :
 - Compounds of alkali metals (e.g., Na_2CO_3 , $NaNO_3$, K_2CO_3 , KNO_3 , Na_2SO_4 and K_2SO_4).
 - Compounds of alkaline earth metals (e.g., $CaCO_3$, $BaCO_3$, CaO).

Colouring material	Colour
MnO_2	Violet
Cr_2O_3 , $FeSO_4$, Cu	Green
Cd, Sb, Fe, U	Yellow
Na_3AlF_6	Milky white
NiO	Black

5. Annealing of Glass

- Glass is prepared at a very high temperature if it is cooled suddenly, glass being a bad conductor of heat, its upper layer cools down while interior portion remains in a state of strain, due to this unequal expansion of glass it cracks into pieces. To avoid this, glass is cooled slowly. This slow cooling is called as **annealing of glass**.

6. Properties of Glass

	Types of Glass	Ingredients
1.	Common glass or soft glass	$Na_2O \cdot CaO \cdot 6SiO_2$
2.	Hard glass or potash lime glass	$K_2O \cdot CaO \cdot 6SiO_2$
3.	Crooke's glass	$K_2O \cdot PbO \cdot Ce_2O \cdot SiO_2$
4.	Water glass	Sodium silicates

7. Ink

(A) Aniline Ink : (Raw Materials)

- Alcohol, spirit or phenol.
- Carbolic acid and boric acid to prevent the growth of fungi in ink.
- Glycerine is used for making the stamp pad ink.
- Coloured substance.

	Colouring Substance	Colour of Ink
1.	Methylene blue, Acid blue	Blue colour
2.	Eosine and Congo red	Red colour
3.	Aniline black	Black colour

8. Cement

- J. Aspdin introduced cement for the first time in England.
- It resembles with the famous Portland rock in England hence the name Portland cement was given.
- Composition of Portland cement
 - Lime, CaO = 50-60%,
 - Silica, SiO_2 = 20-25%,
 - Alumina, Al_2O_3 = 5 – 10%,
 - Ferric oxide, Fe_2O_3 = 1-2%,
 - Sulphur trioxide, SO_3 = 1-2%,
 - Magnesia MgO = 2-3%
 - Sodium oxide Na_2O = 1%, Potassium oxide K_2O = 1%

9. Raw Materials

- Lime stone ($CaCO_3$) → it supplies CaO
- Clay ($Al_2O_3 \cdot SiO_3 \cdot Fe_2O_3 \cdot 2H_2O$) → it supplies SiO_2 , Al_2O_3
- Gypsum, ($CaSO_4 \cdot 2H_2O$) → It decreases the setting time of cement.

10. Commonly used pigments are :

S. No.	Pigment	Colour	Formula
1.	White lead	White	$2[Pb(OH)_2 \cdot 2PbCO_3]$
2.	Basic lead sulphate	White	$2PbSO_4 \cdot PbO$
3.	Red lead or sindhur	Red	Pb_3O_4
4.	Lithopone	White	$BaSO_4 + ZnS$

11. Safety Matches

The composition of the matchstick head is made up of the undermentioned substances :

- (1) A readily combustible substance like antimony trisulphide, Sb_2S_3 .
- (2) An oxidising agent like $KClO_3$, KNO_2 or red lead.

12. Gun Powder

Gun powder is an important explosive material which is only 1/5 times as powerful as dynamite. It is a mixture of about 75% nitre (KNO_3), 10% sulphur and 15% wood charcoal.