Classwork -May-1

Classes of chemical compounds: oxides/acids/bases/ salts

Oxides are compounds made of two elements one of which is oxygen, e.g., SO_2, SO_3, CO_2, CaO, Fe_2O_3

All oxides can be obtained from elements reactions with oxygen, the elements can be recovered from oxides by the oxides' reactions with hydrogen.

There are basic and acidic oxides.

A. When acidic oxides react with water, they form acids. E.g.:

$$SO_3 + H_2O \rightarrow H_2SO_4$$

B. When basic oxides react with water, they form bases. E.g.:

$$CaO + H_2O \rightarrow Ca(OH)_2$$

Acids can provide H^+ (proton) for reactions with other compounds.

$$H_2SO_4 + Zn \rightarrow H_2 + ZnSO_4$$

$$HCl + Ag\ NO_3 \rightarrow AgCl + HNO_3$$

An acid is composed from atoms of hydrogen and a conjugate base. The conjugate base reacts as an independent particle. (SO_4^{2-}, Cl^-, NO_3^- - are conjugate bases of sulfuric, hydrochloric, and nitric acids respectively).

Bases can provide OH- for reactions with other compounds.

$$Ca(OH)_2 + HCl \rightarrow CaCl_2 + HOH\ (H_2O)$$

Reactions where acids and bases react with each other are called **reactions of neutralization**. In these reactions a salt and water are formed. E.g. below is a neutralization reaction between hydrochloric acid (HCl – acid) and sodium hydroxide (NaOH – base) with formation of salt (sodium chloride, NaCl) and water:

$$HCl + NaOH \rightarrow NaCl + H_2O$$

$$H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + 2H_2O$$