

Titration

→ Titration is the word used to determine strength of a solution by reaction it's known volume with solution of known volume and strength. It's the experimental procedure of volumetric analysis.

→ Strength of unknown solution can be calculated with the help of the equation $V_1 S_1 = V_2 S_2$

Titration is of four types

(i) Acid - alkali titration

(ii) Redox titration

(iii) Iodometry and iodimetry

(iv) Precipitation titration

Corrosion

→ The process of slowly eating away of the metal due to attack of atmospheric gases on the surface of the metal resulting in the formation of compounds such as oxides, sulphides, carbonates, sulphates etc. is called corrosion.

→ The most common example of corrosion is rusting of iron. Rust is hydrated ferric oxide, $Fe_2O_3 \cdot H_2O$.

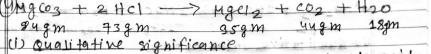
Prevention of corrosion

(i) Alloying the metal

(ii) Electroplating

(iii) Hot - dipping

(iv) Using anti - rust solutions.



(ii) Quantitative significance

(a) Magnesium carbonate and hydrochloric acid are reactants to produce magnesium chloride, carbon dioxide gas and water.

(b) Magnesium carbonate reacts with hydrochloric acid to give magnesium chloride, carbon dioxide gas and water.

(iii) Quantitative significance

(a) 1 mole of $MgCO_3$ reacts with 2 moles of HCl to produce 1 mole of $MgCl_2$, 1 mole of CO_2 gas and 1 mole of H_2O .

(b) 89 gm of $MgCO_3$ reacts with 73 gm of HCl to give 45.9 gm of $MgCl_2$, 44 gm of CO_2 gas and 18 gm of H_2O .

(iv) $2SO_2 + O_2 \rightarrow 2SO_3$

$128\text{gm} \quad 32\text{gm} \quad 260\text{gm}$

(v) Quantitative significance

(a) Sulphur dioxide and oxygen are reactants to produce sulphur trioxide.

(b) Sulphur dioxide reacts with oxygen to give sulphur trioxide.

(vi) Quantitative significance

(a) 2 mole of SO_2 reacts with 1 mole of O_2 to produce 2 mole of SO_3 .

(b) 228 gm of SO_2 reacts with 32 gm of O_2 to give 160 gm of SO_3 .

Write down the electron dot structures and classify them on the basis of bonds involved in the molecules:

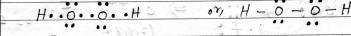
(i) Na_2S



(ii) H_2O



(iii) H_2O_2



(iv) Electrovalent compound: Na_2S

In Na_2S only electrovalent bond is present.

(v) Covalent compounds: H_2O and H_2O_2

In H_2O and H_2O_2 only covalent bonds are present.

(vi) Electrovalent compound (transfers one or more electrons)

→ Transfer of electrons are called electrovalent compound.

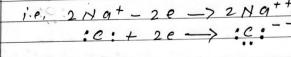
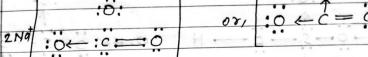
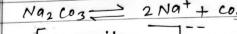
→ They have high density, melting point & boiling point for e.g.: $NaCl$, CaO

(vii) Covalent compounds (less or gain of electrons)

→ sharing of electrons are called covalent compounds.

→ They have low density, melting point & boiling point for e.g.: H_2O , He

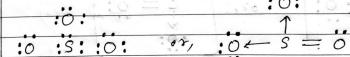
(viii) Na_2CO_3



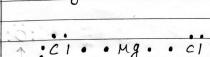
(ix) SO_2



(x) SO_3



(xi) $MgCl_2$



(x) Write quantitative significance of the following chemical:

$2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$

→ The given chemical equation is

$2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$

$2 \times 40\text{gm} \quad 98\text{gm} \quad 142\text{gm} \quad 2 \times 18\text{gm}$

(i) Quantitative significance

(a) Sodium hydroxide reacts with Sulphuric acid to give Sodium Sulphate and water.

(b) Sodium hydroxide and Sulphuric acid are reactants.

Sodium sulphate and water are the products of this reaction.

(ii) Quantitative significance

(a) 2 mole of $NaOH$ reacts with 1 mole of H_2SO_4 to give 1 mole of Na_2SO_4 and 1 mole of H_2O .

(b) 80 gm of $NaOH$ reacts with 98 gm of H_2SO_4 to give 142 gm of Na_2SO_4 and 18 gm of H_2O (water).

(iii) What is mole? calculate the number of mole in

(i) 11.2 litre of CO_2 at N.T.P.

We have,

$22.4 \text{ litres of } CO_2 \text{ at N.T.P.} = 1 \text{ mole of } CO_2$

$\therefore 11.2 \text{ litres of } CO_2 \text{ at N.T.P.} = \frac{11.2}{22.4} = 0.5 \text{ mole of } CO_2$

Numerical

(iv) 11.2 litre of CO_2 at N.T.P.

We have,

$22.4 \text{ litres of } CO_2 \text{ at N.T.P.} = 1 \text{ mole of } CO_2$

$\therefore 11.2 \text{ litres of } CO_2 \text{ at N.T.P.} = \frac{11.2}{22.4} = 0.5 \text{ mole of } CO_2$

What is covalent bond? How it is formed?

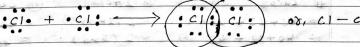
Explain with an example.

→ The chemical linkage formed by mutual sharing of electrons between the combining atoms of same or different elements is covalent bond.

→ The number of electrons used for sharing by the both atoms is equal which is known as covalency. Compounds formed due to this bond are called covalent compounds.

Formation of Cl_2 molecule.

→ Chlorine molecule is formed by the combination of two chlorine atoms. Each atom contains 7 valence electrons. Each atom contributes one electrons to form a covalent. Hence, Cl_2 molecule is a covalent compound and its covalency is one.



Covalent bond is represented by a dash line
(c)

Q. What information do you get from the following chemical equations?

or,

Explain clearly the significance of the following equation.

or,

What are the qualitative and quantitative significances of given chemical equations?

(i) $Caco_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2 \uparrow$

$\Rightarrow 100\text{gm} \quad 73\text{gm} \quad 111\text{gm} \quad 18\text{gm} \quad 44\text{gm}$

(ii) Qualitative information

(a) calcium carbonate and Hydrochloric acid are reactants to produce calcium chloride, water and carbon dioxide gas.

(b) calcium carbonate reacts with hydrochloric acid to give calcium chloride, water and carbon dioxide gas.

(iii) Quantitative information

(a) 1 mole of $Caco_3$ reacts with 2 moles of HCl to produce 1 mole of $CaCl_2$, 1 mole of H_2O and 1 mole of CO_2 .

(b) 100 gm of $Caco_3$ reacts with 73 gm of HCl to give 111 gm of $CaCl_2$, 18 gm of water and 44 gm of CO_2 .