Acids and Alkalis

Arrhenius' idea of ionisation:

acid - a substance which dissolved in water produces hydrogen ions (H^+)

alkali - a substance which dissolved in water produces hydroxide ions (OH^-)

Lowry and Bronsted

acid - a proton donor

alkali - a proton acceptor

Arrhenius' idea took a long time to be accepted as it was completely new. Lowry and Bronsted theory was readily accepted as it was a refinement of an existing idea and it explaind behaviours with non-aqueous solvents.

STRONG ACID OR ALKALI - completely ionised in water (all of compound dissociates into ions)

WEAK ACID OR ALKALI - partially ionised in water.

Indicators

strong acid + strong alkali - any

weak acid + strong alkali - phenolphthalein

strong acid + weak alkali - use methyl orange.

Titration (neutralisation)

$20cm^3$ of 1.0M reacted with $25cm^3$ of NaOH.

What is the concentration of NaOH?

- work out balanced equation

$HCl + NaOH \longrightarrow NaCl + H_2O$

- work out number of moles in solution using known concentration and volume.

$$\text{Moles} = \frac{\text{Concentration} \times \text{Volume } (cm^3)}{1000}$$

$$\frac{1 \times 20}{1000} = 0.02 \text{ moles of HCl}$$

- work out number of reactant moles

HCl : NaOH Moles of NaOH = moles of HCl = 0.02 moles of NaOH

1 : 1

- work out concentration of reactant solution.

$$\frac{\text{moles}}{\text{volume}} \times 1000 \qquad \frac{0.02}{25} \times 1000 = 0.8 \text{ mol/dm}^3$$