



Year: 11

Topic: 5.2 ACIDS, BASES AND SALTS

Knowledge and Understanding to be developed:

In this topic, learners will investigate the reactions of acids in depth. Neutralisation theory and titration concepts are introduced, giving ample opportunity both for practical investigations and for learners to develop their understanding of reaction processes. Learners should be able to write word and balanced symbol equations (including ionic equations where relevant) for all reactions described in this topic.

Working Scientifically

In this topic, learners will use scientific vocabulary, terminology and definitions to describe chemical methods and reactions. They can apply a knowledge of a range of techniques, instruments, apparatus, and materials. Writing chemical equations will enable them to correctly use formulae, symbols and correct nomenclature.

Mathematical Skills

Mathematical skills will be used in this topic to balance ionic formulae and chemical equations.

Key Terms to be learned this topic:

Acid

Alkali

Neutral

Universal Indicator

pH scale

Neutralisation

Titration

Concentration

Soluble

Insoluble

Salt

Learning Objectives and Outcomes:

Students should be able to demonstrate and apply their knowledge and understanding of :

- (a) substances as acidic, alkaline or neutral in terms of the pH scale, including acid/alkali strength
- (b) solutions of acids containing hydrogen ions and alkalis containing hydroxide ions
- (c) the reactions of dilute acids with metals and how these relate to the metals' position in the reactivity series
- (d) the neutralisation of dilute acids with bases (including alkalis) and carbonates
- (e) neutralisation as the reaction of hydrogen ions with hydroxide ions to form water $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$
- (f) the acid/carbonate reaction as a test for acidic substances and CO_3^{2-} ions
- (g) the preparation of crystals of soluble salts, such as copper(II) sulfate, from insoluble bases and carbonates
- (h) the names of the salts formed by hydrochloric acid, nitric acid and sulfuric acid
- (i) the test used to identify SO_4^{2-} ions
- (j) titration as a method to prepare solutions of soluble salts and to determine relative concentrations of solutions of acids/alkalis

SPECIFIED PRACTICAL WORK

- Preparation of crystals of a soluble salt from an insoluble base or carbonate
- Titration of a strong acid against a strong base using an indicator

