Definitions and Concepts for CAIE Chemistry IGCSE

Topic 7 - Acids, Bases and Salts

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*Definitions in **bold** are for extended supplement only*

Definitions have been taken, or modified from the CAIE Cambridge IGCSE Chemistry 0620 syllabus for 2023, 2024 and 2025.

Acid: A chemical which can neutralise bases, acids have a pH value less than 7 and contains H^+ ions. Acids will react with metals to produce a salt and hydrogen and will react with carbonates to produce a salt, water and carbon dioxide. **Acids are proton donors.**

Acidic oxide: Formed when a non-metal reacts with oxygen. Acidic oxides produce an acid when reacted with water. Examples of acidic oxides: CO_2 and SO_2

Alkali: Alkalis are bases that are soluble (dissolve in aqueous solutions to release hydrogen ions OH^- ions)

Amphoteric: **Able to act as an acid and a base.**

Amphoteric oxide: Amphoteric oxides are oxides that react with acids and bases to produce a salt and water. Examples of amphoteric oxides: Al_2O_3 and ZnO

Anhydrous substance: An anhydrous substance is a substance that does not contain water

Base: A chemical which reacts with acids in neutralisation reactions. Bases react with ammonium salts to produce a salt, ammonia gas and water. **Bases are proton acceptors.**

Basic oxide: Formed when a metal reacts with oxygen. Basic oxides produce a base when reacted with water. Examples of acidic oxides: CuO and CaO

Crystallisation: A separation technique to obtain soluble solids from solutions. The process involves heating the solution until crystals start to form, leaving the solution to cool and then filtering the formed crystals from the solution.

Filtration: A separation technique used to separate an insoluble solid from a solution.

Hydrated substance: A hydrated substance is a substance that is chemically combined with water, e.g.hydrated salts

Litmus: A chemical dye which is used to identify acids and bases. The dye is red in the

presence of an acid and blue in the presence of a base.

Methyl orange: A chemical indicator which is used to identify acids and bases. The indicator is red in acids and yellow in bases.

Neutralisation: The reaction in which an acid and a base react together to form a salt and water.

pH scale: A measure of the acidity or alkalinity of a solution. The scale ranges from 0-14 and can be measured using universal indicator or a pH probe.

Precipitation reaction: A reaction in which solutions react to form an insoluble product.

Strong acid: A strong acid is completely ionised in an aqueous solution so that nearly all the H^+ ions are released. Examples of strong acids include hydrochloric, nitric and sulfuric acids.

Universal indicator: A mixture of dyes that changes colour gradually over a range of pH and is used in testing for acids and alkalis.

Water of crystallisation: Water of crystallisation refers to the water molecules that are present in hydrated crystals. They are usually indicated by a black dot in the molecular formula. E.g.$CuSO_4 \cdot 5H_2O$ and $CoCl_2 \cdot 6H_2O$

Weak acid: A weak acid is only partially ionised in an aqueous solution. This means only a small number of the H^+ ions are released. Examples of weak acids include ethanoic, citric and carbonic acids. The symbol equation for its dissociation will have a reversible sign $\rightleftharpoons$