EDEXCEL TOPIC 3: CHEMICAL CHANGES 1

Acids

Base	*A base is any substance that reacts with an acid to form a salt and water only*
Examples of soluble bases	*Alkalis e.g. sodium hydroxide, potassium hydroxide*

Concentrated	*High mass of substance in a given volume of solution*
Dilute	*Low mass of substance in a given volume of solution*
Strong acids	*Completely ionised in aqueous solutions e.g. hydrochloric, nitric and sulfuric acids.*
Weak acids	*Only partially ionised in aqueous solutions e.g. ethanoic acid, citric acid.*
Hydrogen ion concentration	*As the pH decreases by one unit (becoming a stronger acid), the hydrogen ion concentration increases by a factor of 10.*

Strong and weak acids (HT ONLY)

Reactions with acids

Reactions with acids		
Metals	*Metal + acid → metal salt + hydrogen*	Magnesium + hydrochloric acid → magnesium chloride + hydrogen
Metal oxides	*Metal oxide + acid → metal salt + water*	Copper oxide + sulfuric acid → copper sulfate + water
Metal hydroxides	*Metal hydroxide + acid → metal salt + water*	Sodium hydroxide + nitric acid → sodium nitrate + water
Metal carbonates	*Metal carbonates + acid → metal salt + carbon dioxide + water*	Calcium carbonate + sulfuric acid → calcium sulfate + carbon dioxide + water

Producing salts from insoluble reactants

Soluble salts	*Soluble salts can be made from reacting acids with solid insoluble substances (e.g. metals, metal oxides, hydroxides and carbonates).*
Production of soluble salts	*Add the solid to the acid until no more dissolves. Filter off excess solid and then crystallise to produce solid salts.*

Producing salts from soluble reactants

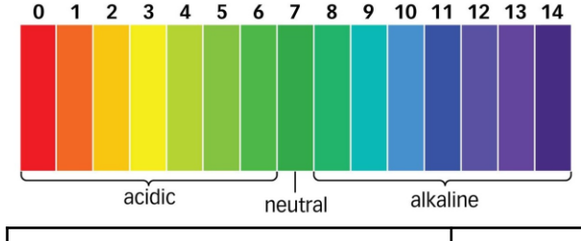
Titration	*The acid and the soluble reactant are mixed in the correct proportions and the remaining solution is only salt and water*

Gas tests

Gas	Test	Positive result
Hydrogen	*Burning splint*	'Pop' sound.
Carbon dioxide	*Limewater*	Goes cloudy (as a solid calcium carbonate forms).

The pH scale and indicators

Universal indicator	*Red in acid, green in neutral and blue in alkali*
Litmus	*Red in acid, purple in neutral and blue in alkali*
Methyl orange	*Red in acid, yellow in neutral and yellow in alkali*
Phenolpthalein	*Colourless in acid and in neutral and pink in alkali*



A neutralisation reaction is between an acid and a base	In neutralisation reactions, hydrogen ions react with hydroxide ions to produce water: $H^+ + OH^- \rightarrow H_2O$

Acids	*Acids produce hydrogen ions (H^+) in aqueous solutions.*
Alkalis	*Aqueous solutions of alkalis contain hydroxide ions (OH^-).*