Glossary/Index

Page references are given in bold

A

Activation energy The minimum energy required for a reaction to take place. **96, 109**

Addition polymerisation A chemical reaction in which alkene molecules (monomers) are joined together to form long chains. The alkenes form repeating units in the polymer chain. **130–1**

Addition reactions Typical reactions of alkenes where a molecule is added onto the carbons of the >C=C< bond. **122–4**

Aerobic A process which takes place in the presence of oxygen. **161–2**

Alcohols A homologous series in which the functional group is the –OH or hydroxyl group. **123, 126–7**

Alkali metals Group 1 in the periodic table, the elements lithium down to caesium. They have similar properties because they all have one electron in their outer shell. **28–9**

Alkanes A homologous series of hydrocarbons with the general formula C_nH_{2n+2}. **10, 124–5**

Alkenes A homologous series where the functional group is the >C=C< group. Their general formula is C_nH_{2n}. **122–5**

Alloys Mixtures of metals. **47–8, 166–7, 169**

Ammonia The gas with the formula, NH_3 which is used to prepare fertilisers, explosives, etc. **170–172**

Anaerobic A type of process which takes place in the absence of oxygen. **126, 161**

Anion A negative ion that moves towards the anode during electrolysis. **27, 38, 74, 76, 89, 141–144**

Anode The positive electrode in electrolysis. At this electrode ions lose electrons. **81–89, 141, 159**

Aqueous solution A solution in which the solvent is water. **36, 60, 74, 86, 88–9**

Atom The smallest particle of an element that can take part in a chemical reaction. **10, 18–26**

Atom economy This is a measure of the efficiency of a chemical process. The higher the atom economy the less waste produced. **66, 155**

The formula for its calculation is

$$\text{atom economy} = \frac{\textit{sum of the formula masses of useful products}}{\textit{sum of formula masses of all the reactants}} \times 100\%$$

Atomic number The number of protons in the atom of an element. **10, 19–26**

B

Balanced chemical equation An equation where the number and type of atoms in the reactants are equal to the number and type of atoms in the products. A balanced chemical equation is a consequence of the law of mass conservation. **29, 52, 57**

Barrier method The use of paint, oil, or grease to stop air and water getting to iron. This stops the iron from rusting. **164–5**

Bioleaching Bacteria digest the sulfide in low-grade ores allowing the metal to separate out and be extracted. **159–60**

Bond energy The energy (in kJ/mol) required to break a covalent bond between two atoms. **98**

Borosilicate glass Glass made from boron trioxide and sand. **168**

Brass An alloy of copper and zinc. **166–7**

Bronze An alloy of tin and copper. **166–7**

Burette A graduated tube with a tap which is used to measure the volumes of liquids added to the reaction mixture during a titration. **90–91**

C

Carbon Capture and Storage (CCS) The storage of carbon dioxide deep under the sea in porous sedimentary rocks, especially those near disused oil-wells. **150–51**

Carbon footprint The total amount of carbon dioxide and other greenhouse gases emitted during the lifetime of a product. This includes both its production and its disposal. **150–51**

Carbon monoxide A toxic gas formed during incomplete combustion of hydrocarbons. **70, 72–3, 120, 152–3**

Carbon nanotubes A hollow tube in which carbon atoms are held together by strong covalent bonds. **46**

Carbon off-setting Measures that reduce carbon dioxide in the atmosphere by planting trees or increasing marine algae in the sea. These organisms carry out photosynthesis which removes carbon dioxide from the atmosphere. **150–51**

Carbon taxes Penalties given to companies or organisations which use too much energy or burn excessive amounts of fossil fuels. **150–51**

Carboxylic acids A homologous series where the functional group is the carboxylic acid – or COOH group. **126, 128–9, 132**

Catalyst A catalyst is a substance that speeds up a chemical reaction, and is unchanged chemically and in mass at the end of the reaction. A catalyst speeds up a reaction by helping the reaction proceed via a different pathway which has a lower activation energy. **34, 46, 49, 109, 116, 170**

Cathode The negative electrode in electrolysis. At this electrode ions gain electrons. **81–89, 137, 159**

Cation A positive ion that moves towards the cathode during electrolysis. **27, 38, 74, 76, 89, 141–3**

Ceramics Hard, rigid materials with high melting points that have low thermal and electrical conductivity. **168–9**

Chemical equilibrium A dynamic equilibrium in which the rate of the forward reaction equals the rate of the reverse reaction. At equilibrium, properties of the chemical system such as temperature, pressure and concentrations are constant. **115–6**

Chemical formula A way of displaying the elements present in a substance and the number of atoms of each element present. **10**

Chemical properties The properties of a substance that can be seen either during a chemical reaction involving the substance, or after the reaction has taken place. **11–15**

Chemical symbol Each element has a chemical symbol used to represent it in formulae. **23–4**

Chemical system This is the reactants and products of a reversible reaction together inside a closed container. **115, 170**

Chromatography A separation method used to separate substances in a mixture according to how quickly they travel up paper or another suitable material. **12, 16–17**

Coal A fossil fuel which is a sedimentary rock formed by the compression of dead plants over millions of years. **146–9**

Complete combustion This takes place when a carbon compound burns in enough oxygen to give carbon dioxide and water. **120–131, 153**

Composite These are materials made from two or more materials that have different properties. When these materials are combined they produce a material with different properties from the constituent materials. **168–9**

Compound A substance made of two or more elements that are chemically combined. **10–16, 34, 38–41**