

WJEC (Eduqas) Chemistry A-level

OA4 - The Language of Chemistry and Structure of Matter

Definitions and Concepts

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Definitions and Concepts for WJEC (Eduqas) Chemistry A-level OA4 Organic Synthesis and Analysis

Addition polymerisation: The formation of a long chain molecule when many monomers join together (the polymer is the only product).

Chromatography: A technique used to separate and identify components in a mixture. There are several different types of chromatography, including thin layer chromatography and gas chromatography. Separation during chromatography depends on the balance between each individual compound's solubility in the mobile phase and retention by the stationary phase.

Condensation polymerisation: A long chain molecule formed when monomers react together with the release of small molecules such as water. Types of condensation polymers are polyamides (formed from carboxylic acids/acyl chlorides and amines) and polyesters (formed from carboxylic acids/acyl chlorides and alcohols).

Gas chromatography (GC): A type of chromatography in which a column is packed with a solid (or a solid coated in a liquid) and a gas is passed through the column under pressure at high temperature. Mass spectrometry may then be used to analyse the components separated by GC.

High performance liquid chromatography (HPLC): A type of column chromatography where a solvent is the mobile phase and tightly packed absorbent material is the stationary phase.

Nuclear magnetic resonance (NMR): A technique that uses the absorption of electromagnetic radiation by an atomic nucleus in an external magnetic field to analyse the structure of a compound. Typically, either ^{13}C or ^1H nuclei are analysed. ^{13}C NMR spectra are generally simpler than ^1H NMR spectra.

Organic compound: A carbon-containing compound.

Polyamide: A type of condensation polymer formed by the linkage of an amine group in one monomer with a carboxylic acid group of another. These polymers can be broken down by hydrolysis and are biodegradable. The bond between each monomer is called an amide linkage.

Polyester: A type of condensation polymer formed by the linkage of an alcohol group in one monomer with a carboxylic acid group of another (e.g. Terylene). These polymers can be broken down by hydrolysis and are biodegradable. The bond between each monomer is called an ester linkage.





Proton NMR spectroscopy: A type of NMR spectroscopy which analyses ^1H nuclei. The number of peaks on the spectrum shows the number of proton environments and the chemical shifts represent the environments. The area under each peak shows the relative number of protons in each environment. The splitting pattern can be used to work out the number of adjacent protons.

Polymerisation: The process of making a polymer from its monomers. There are two types: addition polymerisation and condensation polymerisation.

Purification: The process of removing impurities or contaminants from a product.

Separation: A method of getting distinct separate products from a mixture.

Synthesis: Combining different elements and compounds to build new molecules.

Thin layer chromatography (TLC): A technique used to separate mixtures. The stationary phase is a thin layer of alumina or silica fixed to a metal or glass plate. The plate is dotted with the mixture and placed in a beaker of solvent which is allowed to travel up the plate. The mixture separates due to the components having different solubilities in the mobile phase.

