

CAIE Chemistry A-level

35: Polymerisation

(A-level only)

Definitions

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Definitions and Concepts for CAIE Chemistry A-level Polymerisation

Amino acid: An organic compound containing both a carboxyl group ($-\text{COOH}$) and an amino group ($-\text{NH}_2$).

Condensation polymerisation: A reaction in which a long chain molecule is formed from monomers which 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).

Dicarboxylic acid: A molecule with two carboxylic acid functional groups ($-\text{COOH}$).

Diol: A molecule with two alcohol functional groups ($-\text{OH}$).

Dioyl chloride: A molecule with two acyl chloride functional groups ($-\text{COCl}$).

Hydrolysis: A reaction in which a molecule is broken down by its reaction with water.

Monomer: A small molecule that is used to form polymers.

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.

Polymer: A large molecule made from many small monomers that have been bonded together.

Polymer disposal: Most polymers are unreactive which means they are not biodegradable (cannot be broken down by microorganisms). This means they are often disposed of in landfills, incinerated (which releases greenhouse gases), or recycled (often expensive and takes time).

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

Repeat unit: A structure within a polymer that appears over and over again. Joining many repeat units together would form the polymer.

