7.3 SYNTHETIC AND NATURALLY OCCURRING POLYMERS (CHEMSITRY ONLY)

Amino acids

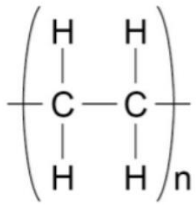
- Have two different functional groups
  - Basic amino group $-NH_2$
  - Acidic carboxyl group $-COOH$
- React by condensation polymerisation
  - Produce polypeptides
- Proteins produced when different amino acids are combined in the same chain

DNA

- Large molecule
- Found in every living thing
- Contains genetic instructions
  - Essential for life
- Double helix structure
  - Usually made up of two polymer chains made from four different monomers
  - The monomers are called nucleotides
- Other naturally occurring polymers...
  - Starch
    - Used by plants to store energy
  - Cellulose
    - Found in plant cell walls
  - Protein
    - Used to make body tissue
    - Made up of amino acids

Polymerisation

- Lots of short chain monomers join together to form long chain polymers
- Addition polymerisation
  - The only product is the polymer
  - Monomers are alkenes
    - poly(ethene) poly(propene)
    - Double bond opens up and joins together
    - Repeating unit



- Condensation polymerisation
  - Monomers have two functional groups
    - E.g. Diols react with dicarboxylic acids to produce polyesters
  - For each bond that forms between monomers, a small molecule is lost
    - E.g. Water

KEY

'Higher only' written in yellow.

AQA

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