Answer all the questions below then check your answers

1. Which of the following is an example of a monomer used in addition polymerisation?

   a) Ethene

   b) Glucose

   c) Amino acid

   d) Sodium chloride

2. During addition polymerisation, the double bonds in monomers:

   a) Break and form single bonds

   b) Remain unchanged

   c) Convert to triple bonds

   d) React with water

3. Match the monomer with its corresponding polymer:

monomer
Ethene
Propene
chloroethene

polymer
Polyvinyl chloride (PVC)
Polyethylene (PE)
Polypropylene (PP)

4. Complete the sentences below by filling in the gaps:

a. Addition polymerisation involves the _____ of monomers with _____ bonds to form a polymer.

b. The polymer formed from the monomer ethene is called _____ and is widely used in _____. It is created by breaking the _____ bond in ethene molecules.

c. Explain why alkenes are suitable monomers for addition polymerization.

d. Draw the repeating unit of the polymer formed from the monomer tetrafluoroethene (C_2F_4).

e. A polymer has the repeating unit [-CH2-CH(CH3)-]n. Identify the monomer used to form this polymer.

5. Explain the process of addition polymerisation.

6. Describe the properties and uses of polyvinyl chloride (PVC).

7a) Name the monomer used to produce polystyrene.

b) Describe the structure of the monomer.

c) Explain how the monomer forms the polymer.

Answers

1. Which of the following is an example of a monomer used in addition polymerisation?

   a) Ethene

   b) Glucose

   c) Amino acid

   d) Sodium chloride

   Answer: a) Ethene

2. During addition polymerisation, the double bonds in monomers:

   a) Break and form single bonds

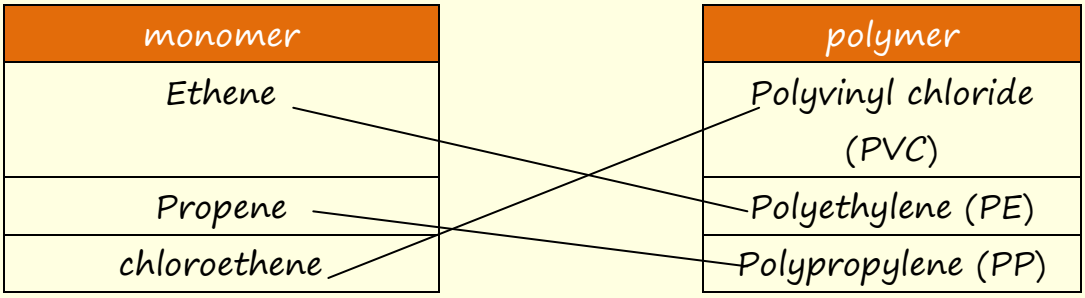
   b) Remain unchanged

   c) Convert to triple bonds

   d) React with water

   Answer: a) Break and form single bonds

3. Match the monomer with its corresponding polymer:



4. Complete the sentences below by filling in the gaps:

a. Addition polymerisation involves the _____ of monomers with _____ bonds to form a polymer.

Answer: Addition polymerisation involves the joining of monomers with double bonds to form a polymer.

b. The polymer formed from the monomer ethene is called _____ and is widely used in _____. It is created by breaking the _____ bond in ethene molecules.

The polymer formed from ethene is called polyethylene and is widely used in plastic bags. It is created by breaking the double carbon carbon bond in ethene molecules.

c. Explain why alkenes are suitable monomers for addition polymerization.

Alkenes contain a carbon-carbon double bond that can break open, allowing monomers to link together.

d. Draw the repeating unit of the polymer formed from the monomer tetrafluoroethene (C_2F_4).

Answer: [-CF_2-CF_2-]n

e. A polymer has the repeating unit [-CH2-CH(CH3)-]n. Identify the monomer used to form this polymer.

Answer: Propene

5. Explain the process of addition polymerisation.

Addition polymerisation is a chemical reaction where unsaturated monomers with double bonds (e.g. alkenes) react to form a long-chain polymer. During this process, the double bonds in the monomers break and form single bonds, allowing the monomers to link together in a repeating sequence in a giant polymer molecule. No other small molecules are produced in this type of polymerisation.

6. Describe the properties and uses of polyvinyl chloride (PVC).

Polyvinyl chloride (PVC) is a durable, chemical-resistant, and relatively inexpensive polymer. It is rigid but can be made flexible by adding plasticizers. PVC is used in a variety of applications, including plumbing pipes, electrical cable insulation, clothing, and flooring. Its resistance to corrosion and chemicals makes it ideal for construction materials.

7a) Name the monomer used to produce polystyrene.

b) Describe the structure of the monomer.

c) Explain how the monomer forms the polymer.

Answer: a) The monomer used to produce polystyrene is styrene.

b) Styrene has the chemical formula C_8H_8 and consists of a benzene ring (C_6H_5) attached to an ethene group ($CH=CH_2$).

c) In addition polymerisation, the double bond in the ethene group of styrene breaks, allowing each styrene monomer to connect with another, forming long chains. This results in a polymer, polystyrene, where the benzene rings are pendant groups along the hydrocarbon chain.