Answer all the questions below then check your answers

1. What type of reaction forms polyamides?

a) Addition polymerisation b) Condensation polymerisation

c) Cracking d) Esterification

2. Fill in the Blanks to complete the sentence below:

Polyamides are formed from the reaction of a _____ acid and a _____.

3. What is the small molecule released during the formation of a polyamide?

4. Match the monomer with the type of polymer it forms:

monomers
Dicarboxylic acid + Diol
Amino Acids
Dicarboxylic acid + Diamine

Polymer formed
Polyamide
Polypeptide/Protein
Polyester

5. True or False: Nylon is a naturally occurring polymer.

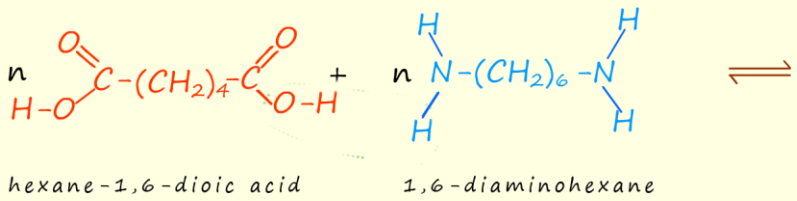
6. Why was nylon so popular when it was first used to make ladies stockings and tights?

7. Give three examples of how nylon is used in everyday life.

8. What two monomers are used to make nylon-6,6?

9. The name "nylon-6,6" is significant. Explain why.

10 Complete the diagram below to show how the repeat unit in a polyamide is formed. Clearly label the amide or peptide link.



hexane-1,6-dioic acid 1,6-diaminohexane

11. Nylon is thermoplastic. What does this mean, and how does this property affect its uses?

12. How is the formation of a polyamide similar to the formation of a polyester? How is it different?

13. How are amino acids related to polyamides?

Answers

1. What type of reaction forms polyamides?

a) Addition polymerisation b) Condensation polymerisation

c) Cracking d) Esterification

Answer: b) condensation polymerisation

2. Fill in the Blanks to complete the sentence below:

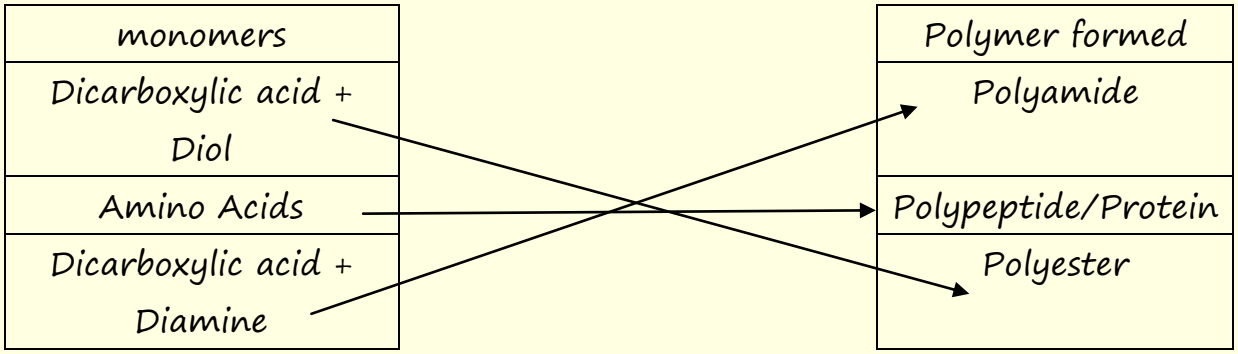
Polyamides are formed from the reaction of a _____ acid and a _____.

Answer: dicarboxylic, diamine

3. What is the small molecule released during the formation of a polyamide?

Answer: Water (or similar small molecule like HCl)

4. Match the monomer with the type of polymer it forms:



5. True or False:

Nylon is a naturally occurring polymer.

Answer: False, it is a synthetic polymer

6. Why was nylon so popular when it was first used to make ladies stockings and tights?

Answer: It was a cheaper and more durable alternative to silk, particularly for stockings.

7. Give three examples of how nylon is used in everyday life.

Answer: Stockings/tights, ropes, toothbrush bristles (or any other three valid examples from the webpage on polyamides).

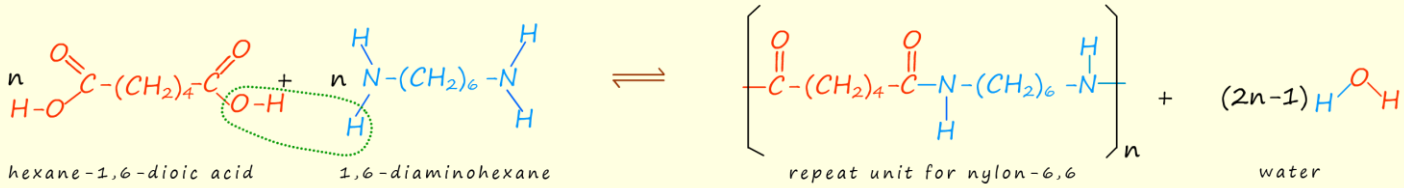
8. What two monomers are used to make nylon-6,6?

Answer: Hexanedioic acid and hexane-1,6-diamine

9. The name "nylon-6,6" is significant. Explain why.

Answer: The "6,6" refers to the fact that both monomers used to make it contain six carbon atoms.

10 Complete the diagram below to show how the repeat unit in a polyamide is formed. Clearly label the amide or peptide link.



11. Nylon is thermoplastic. What does this mean, and how does this property affect its uses?

Answer: Thermoplastic means nylon can be melted and reshaped when heated. This allows it to be moulded into various shapes (e.g., machine parts) and spun into fibres for textiles.

12. How is the formation of a polyamide similar to the formation of a polyester? How is it different?

Answer: Similar: Both are formed through condensation polymerisation reactions, releasing a small molecule.

Different: Polyesters use diols and dicarboxylic acids, forming ester linkages. Polyamides use diamines and dicarboxylic acids, forming amide linkages.

13. How are amino acids related to polyamides?

Answer: Amino acids contain both the carboxyl ($-COOH$) and amino ($-NH_2$) groups needed to form amide bonds. They can polymerise to form polypeptides and proteins, which are essentially polyamides.