



Answer all the questions below then check your answers

1. Fill in the blanks to complete the sentence below:
 - a. HDPE stands for High-Density Polyethylene, whereas LDPE stands for _____.
2. Which type of polyethylene is more rigid HDPE or LDPE?
3. Fill in the blank: LDPE has a more _____ structure compared to HDPE.
4. Which type of polyethylene is commonly used for making plastic bags? HDPE or LDPE?

b. HDPE is often used for plumbing fitting due to its s_____ and d_____.



5. What is one major difference in the properties of HDPE and LDPE?
6. Decide whether each of the items below is made from HDPE or LDPE.
 - a) Plastic bottles - HDPE or LDPE

b) Stretch wrap - HDPE or LDPE

c) Agricultural films - HDPE or LDPE

7. Explain the difference in manufacturing processes of HDPE and LDPE.

8. Which type of polymer can be remelted and reshaped?

a) Thermosetting

b) Thermoplastic/thermosoftening

b. Thermosetting polymers become _____ upon heating and cannot be remelted.

9. Thermoplastic polymers can be _____ multiple times without undergoing significant chemical change.

10. Name two examples each of thermosetting and thermoplastic polymers.

11. Match the polymer type with its characteristic:

a) Can be reshaped multiple times - Thermosetting or thermoplastic

b) Becomes permanently hard after heating - Thermosetting or thermoplastic

12. Describe the structural differences between thermosetting and thermoplastic polymers.

13. Compare and contrast the applications and advantages of thermosetting and thermoplastic polymers.

Answers

1. Fill in the blanks to complete the sentence below:

a. HDPE stands for High-Density Polyethylene, whereas LDPE stands for _____.

Answer: Low-Density Polyethylene

2. Which type of polyethylene is more rigid HDPE or LDPE?

Answer: HDPE

3. Fill in the blank: LDPE has a more _____ structure compared to HDPE.

Answer: branched/open

4. Which type of polyethylene is commonly used for making plastic bags? HDPE or LDPE?

Answer: LDPE

b. HDPE is often used for plumbing fitting due to its s_____ and d_____.

Answer: strength and durability



5. What is one major difference in the properties of HDPE and LDPE?

HDPE has higher tensile strength and is more rigid due to its linear structure, whereas LDPE is more flexible and has lower tensile strength due to its highly branched structure.

6. Decide whether each of the items below is made from HDPE or LDPE.

a) Plastic bottles - HDPE or LDPE

b) Stretch wrap - HDPE or LDPE

c) Agricultural films - HDPE or LDPE

7. Explain the difference in manufacturing processes of HDPE and LDPE.

HDPE is produced using low pressure and temperature polymerisation using a Ziegler-Natta catalyst, resulting in a linear polymer with minimal branching. LDPE, on the other hand, is made using high pressure and high temperature polymerisation, resulting in a polymer with significant branching.

8. Which type of polymer can be remelted and reshaped?

a) Thermosetting

b) Thermoplastic/thermosoftening

Answer: b) Thermoplastic/thermosoftening polymer

b. Thermosetting polymers become _____ upon heating and cannot be remelted.

Answer: permanently hard

9. Thermoplastic polymers can be _____ multiple times without undergoing significant chemical change.

Answer: remelted and reshaped

10. Name two examples each of thermosetting and thermoplastic polymers.

Answer: Thermosetting polymers: Epoxy resin, Bakelite.

Thermoplastic polymers: Polyethylene (PE), Polyvinyl Chloride (PVC).

11. Match the polymer type with its characteristic:

- a) Can be reshaped multiple times- Thermosetting or *thermoplastic*
- b) Becomes permanently hard after heating -*Thermosetting* or thermoplastic

12. Describe the structural differences between thermosetting and thermoplastic polymers.

Thermosetting polymers have a cross-linked network structure where the long polymer chains are cross-linked by strong covalent bonds, making them rigid and heat-resistant. Thermoplastic polymers have linear or slightly branched structures that allow them to be melted and reshaped multiple times without significant chemical change. These polymers only have weak intermolecular bonding between the long polymer chains.

13. Compare and contrast the applications and advantages of thermosetting and thermoplastic polymers.

Thermosetting polymers are used in applications requiring high heat resistance and structural strength, such as kettle and car parts. They are advantageous due to their durability and resistance to deformation. Thermoplastic polymers are used in a wide range of applications including packaging, containers, and household goods. Their advantages include ease of processing, recyclability, and versatility in forming various shapes and products.