

SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

COIMBATORE



Puzzle 1: Monomer Match-Up (Beginner)

1: You are a polymer detective! Match each polymer to its correct monomer(s) from the list below. One polymer has two monomers. Can you get all five, correct?

Polymers:

1. Polyvinyl chloride (PVC)
2. Polyethylene
3. Nylon 6,6
4. Polystyrene
5. Terylene (Polyester)

Monomers:

- A. Ethylene
- B. Vinyl chloride
- C. Styrene
- D. Hexamethylenediamine and Adipic acid
- E. Ethylene glycol and Terephthalic acid

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Puzzle 2: Polymer Property Riddle (Intermediate)

Riddle : I am a polymer used in pipes and cables. My monomer has a chlorine atom, making me flame-resistant. I can be rigid or flexible depending on additives. What am I, and what is my monomer?

Challenge: Name the polymer and its monomer, and explain why additives change my properties.

Puzzle 3: Structure Scramble (Intermediate)

Question: The repeating unit of a polymer is scrambled as $[-\text{NH}-(\text{CH}_2)_6-\text{NH}-\text{CO}-(\text{CH}_2)_4-\text{CO}-]$. Unscramble its identity and determine:

1. The polymer's name.
2. The type of polymerization (addition or condensation).
3. The functional group in the repeating unit.

Challenge: Draw or describe the monomers that form this polymer.

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Puzzle 4: Vulcanization Codebreaker (Advanced)

Question: Natural rubber is soft and sticky, but vulcanization makes it tough. The process involves a cross-linking agent, often represented by the symbol S. Decode the following

Code: “S bridges transform cis-1,4-polyisoprene into a network.”

-Task: Identify the polymer, the cross-linking agent, and explain how the process changes its properties.

Challenge: If 1 g of rubber (molar mass of isoprene unit = 68 g/mol) reacts with 0.032 g of sulphur (atomic mass = 32 g/mol), estimate the number of isoprene units per sulphur cross-link.

Puzzle 5: Thermoset vs. Thermoplastic Brain Teaser (Advanced)

Question: Two polymers, A and B, are tested. Polymer A softens when heated and can be reshaped, while Polymer B chars and remains rigid. Polymer A is made from ethylene, and Polymer B is made from phenol and formaldehyde.

1. Classify A and B as thermoplastic or thermosetting.
2. Predict their repeating unit structures.
3. Explain why their thermal behaviors differ.