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# Sardar Patel University

B. Sc. (Semester - VI) Examination

Date: 16-07-2021, Friday

Time: 10:00-12:00

Industrial Chemistry Vocational

COURSE NO: US06CICV22 (Polymer Science and Technology)

Notes: Figures to the right indicate full marks.

Total marks: 70

Q.1 Answer the following Multiple Choice Questions. (All are compulsory) (10)

- Which of the following is a co polymer .....?
  - ABS
  - Polyethene
  - Bakelite.
  - Teflon.
- Thermoplastic materials .....
  - Do not soften on application of heat
  - Are solvent insoluble
  - Are heating branched molecule
  - None of These.
- ..... is an addition polymer.
  - Nylon
  - Polyethene
  - Bakelite
  - All of These
- Temperature boundary between plastic and elastic phase of polymer is denoted as..
  - Glass Transition Temperature
  - Melting Point
  - Boiling Point
  - Vaporization Point
- Which of the following kind of polymers are known for their high Crystallinity?
  - Isotactic
  - Syndiotactic
  - Atactic
  - None of These
- What does the ratio of number to weight average degree of polymerization for a bifunctional system represent?
  - Degree of Polymerization
  - Breadth of Molecular Size
  - Extent of Reaction
  - None of These
- Acetylene on hydrogenation yield.....
  - Acetylene
  - Ethylene
  - Propylene
  - Methane
- LDPE is prepared by a typical \_\_\_\_ polymerization.
  - Free Radical
  - Anionic
  - Cationic
  - None of These
- The strength of the polymer increases with \_\_\_\_\_ in molecular weight.
  - Increase
  - Decrease
  - No change
  - Slightly decrease
- The optimum DP value of cellulose is \_\_\_\_\_
  - 150
  - 250
  - 400
  - 500



(P.T-0.)

Q.2 Answer the following:

(08)

1. When each chiral centre has the same configuration, the polymer is called isotactic. True / False?
2. Addition polymerization requires the presence of a double bond in monomer. True / False?
3. Below threshold degree of polymerization (DP), the polymer does not possess any strength and exist either as liquid resin or friable powder. True / False?
4. Phenolic resins have good chemical resistance. True / False?
5. Thermosets are generally insoluble in any solvent. True / False?
6. Phenolic resins have good chemical resistance. True / False?
7. LDPE is suitable for the manufacture of pipes for distribution of gas. True / False?
8. HDPE possess greater tensile strength compared to LDPE. True / False?

Q.3 Answer the following short questions (Any Ten).

1. Define term "Elastomers"
2. Differentiates term Thermosetting & Thermoplastic Polymers.
3. Define term "Initiator".
4. Explain the term "Crystallinity".
5. Enlist & express the method of "Average molecular weight".
6. What is Glass transition temperature?
7. What is the raw material required for the production of phenol formaldehyde resin?
8. Give three isomeric structure of dihydroxy diphenyl methane.
9. Give the reaction condition of Novalac resin.
10. What is poly ethylene? Mention the different sources of ethylene.
11. Compare the properties of LDPE & HDPE.
12. Give the name of several processes for polymerization of ethylene to polyethylene.



Q.4 Attempt any four questions.

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1. Explain the mechanism of free radical polymerization with suitable example.
2. Explain Emulsion & Suspension polymerization techniques.
3. Explain the generalization concept of number average and weight average molecular weight.
4. Explain poly-dispersity & molecular weight distribution in polymers.
5. Give the manufacturing process of phenol formaldehyde resole.
6. List the raw materials for epoxy resin? What are their principle fields of application?
7. With suitable flow diagram, explain briefly how vinyl chloride monomer is prepared from acetylene.
8. Give the neat sketch of flow diagram and explain the manufacturing of nylon 6.

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