

SARDAR PATEL UNIVERSITY
M. Sc. -Chemistry (Fourth Semester) EXAMINATION
 Industrial Polymer chemistry (IPC)

PS04CIPC22: Manufacture, Properties and Applications of Thermoplastics

20th March, 2019, Wednesday,

Time: 2.00 pm to 5.00 pm

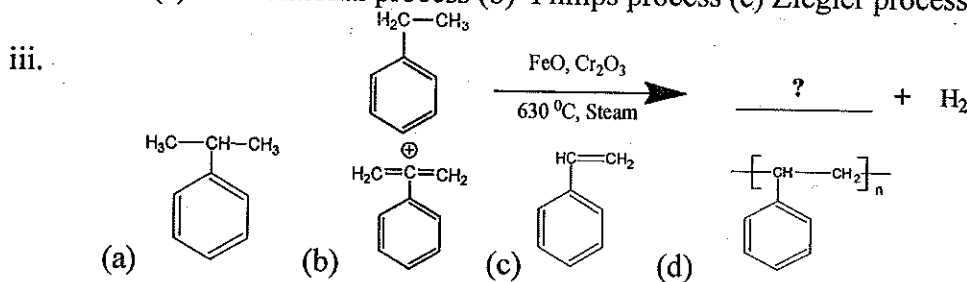
Note: Figure to the right in brackets indicates the full marks

Total marks: 70

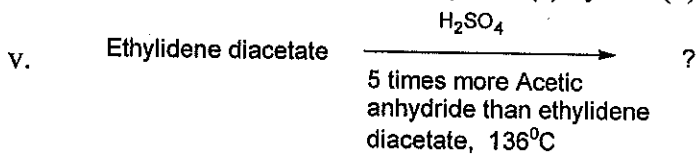
QUE.1 Answer the following questions by selecting the most appropriate option. (8)

i. Major growth period of the plastic industries has been since _____.
 (a) 1920 (b) 1930 (c) 1940 (d) 1950

ii. Which is the high pressure polymerization process of ethylene?
 (a) Conventional process (b) Philips process (c) Ziegler process (d) Unipol process



iv. The impregnated PS beads are prepared by incorporating _____ (~6%) during polymerization of styrene.
 (a) ethyl benzene (b) ethylene (c) xylene (d) n-pentane



- (a) 45% Vinyl acetate, 15% acetic acid, 20% acetic anhydride, 4% ethylidene diacetate, 8% acetaldehyde
- (b) 40% Vinyl acetate, 20% acetic acid, 20% acetic anhydride, 4% ethylidene diacetate, 8% acetaldehyde
- (c) 40% Vinyl acetate, 20% acetic acid, 15% acetic anhydride, 9% ethylidene diacetate, 8% acetaldehyde
- (d) 40% Vinyl acetate, 25% acetic acid, 15% acetic anhydride, 8% ethylidene diacetate, 4% acetaldehyde

vi. ω -aminoenanthic acid is used to produce _____.
 (a) nylon,5 (b) nylon,7 (c) nylon,9 (d) nylon,11

vii. _____ gives pleasant appearance and hence used for making handles of knives.
 (a) cellulose acetate (b) cellulose nitrate (c) carboxy methyl cellulose (d) cellulose propionate

viii. The non-stick pan having the coating of _____.
 (a) polyvinylfluoride (b) polyvinylidene fluoride (c) polytetrafluoroethylene (d) polychlorotrifluoroethylene.

QUE.2 Answer the following questions in short. (Any seven). (14)

- i Briefly mention the year wise historical development of plastic materials.
- ii Write the reaction scheme of ethylene monomer preparation.
- iii What is "high yield stereospecific or high selectivity (HYHS) catalyst.
- iv Mention the different commercial trade names of styrene monomer.
- v What is telomerization?
- vi How vinyl acetate can be prepared in recent years?
- vii Describe preparation of polycarbonate by phosgenation process.
- viii Write briefly about the properties of PCTFE.
- ix Why stabilizers are incorporated in plastics?

QUE.3

- A** Write a note on the Slurry process for the manufacturing of LDPE by high pressure process. (6)
- B** Describe the peroxide and vinyl silane cross-linking of polyethylene. (6)

OR

- B** Discuss the industrial process of impact polypropylene (BASF and Unipol process) manufacture.

QUE.4

- A** Mention the reaction scheme of styrene monomer preparation and discuss the industrial process of styrene monomer manufacture. (6)
- B** Give the various routes of vinyl acetate monomer synthesis and its polymerization with applications. (6)

OR

- B** Write a note on poly(vinyl alcohol) and elaborate its structure, properties and uses.

QUE.5

- A** (i) What is auto-acceleration effect in bulk polymerization of methyl methacrylate? Describe manufacture of PMMA sheets. (6)
- (ii) Write a note on cross-linking in linear polyester.

- B** Write atleast three different monomer used for the preparation of different Nylons. (6)

OR

- B** Discuss the manufacturing process of Cellulose nitrate with its applications.

QUE.6

- A** Why additives are incorporated in plastics? Discuss briefly about plasticizers, UV-stabilizers and flame retardents as an additives. (6)

- B** Write a short note on Polytetrafluoroethylene. (6)

OR

- B** Why recycling of plastics are important? discuss about the plastic collection and manual sorting.

— X —
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