LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **CHEMISTRY**

FIFTH SEMESTER – **APRIL 2012**

# CH 5402/5400 - POLYMER CHEMISTRY

Date : 27-04-2012 Dept. No. Max. : 100 Marks

Time : 1:00 - 4:00

**Part - A (Answer ALL questions) (10 x 2 = 20 Marks)**

1. Draw the structures of polyisoprene and polystyrene.
2. Define: Cohesive energy.
3. Mention the uses of polyamide and bakelite.
4. What is Zeigler-Natta catalyst? Mention its use.
5. Why anionic polymerization is also called living polymerization?
6. Mention the significance of CMC.
7. How does benzoyl peroxide initiate polymerization?
8. Mention the conditions for chain end degradation.
9. Account for the thermal stability of Teflon.
10. What are plasticizers? Give an example.

**Part - B (Answer any EIGHT only) (8 x 5 =40 Marks)**

1. How is the number average molecular weight of a polymer estimated?
2. Distinguish between homopolymers and copolymers with examples.
3. Discuss the importance of hydrogen bonding in polymers.
4. Explain the mechanism of preparation of PVC by cationic polymerization.
5. Write a note on step growth polymerization with an example.
6. Explain interfacial polymerization with a suitable example.
7. Mention any two uses of PTFE, Buna-N and Polyester.
8. What are known as zipping and unzipping in polymers?
9. How are (i) Nylon-6,6 and (ii) Neoprene prepared?
10. Articles made up of polypropylene can be steam sterilized **–** explain.
11. Explain the role of polymer additives in polymerization process.
12. Write a note on injection moulding.

**Part - C (Answer any FOUR only) (4 x 10 =40 Marks)**

1. Explain the following with suitable examples

a) plastics and elastomers b) natural and synthetic polymers (5+5)

1. Discuss the mechanism of the preparation of stereo-regular polypropylene using Ziegler-Natta catalyst.
2. a) Discuss the mechanism of a free radical polymerization. (6)

b) Explain auto acceleration in bulk polymerization. (4)

1. Explain the acid and base catalysed mechanism of the formation of phenol-formaldehyde resin.
2. Explain the conductivity of polypyrrole, polysulphur nitriles and polyphenylene with the factor influencing their conductivity.
3. Write a note on the following processing techniques of polymer

a) Calendring b) Die casting (5+5)

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