

Roll No.

Total Pages : 4

1790/M

M-35/2051

POLYMERS AND SURFACE CHEMISTRY

Paper-433

Semester-IV

Time allowed : 3 Hours] [Maximum Marks : 55

Note: The candidates are required to attempt two questions each from Section A carrying 8 marks each and Section B carrying 8½ marks each and the entire Section C consisting of 11 questions carrying 2 marks each.

SECTION-A

1. (a) Describe the effect of Cross-linked density on polymer strength. 3
- (b) Discuss the criteria of polymer solubility. Describe the confirmations of dissolved polymer chain. 5

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2. (a) Discuss the kinetics of cationic-polymerization. 4
- (b) Describe statistical thermodynamics of interpenetrating random coiling polymers in solution. 4
3. Describe in detail light scattering method for the determination of molecular weight of a polymer. 8
4. Write a note on the followings :
 - (a) Co-polymerization. 4
 - (b) Theories of Emulsion. 4

SECTION-B

5. Discuss Langmuir's unimolecular theory of adsorption and hence derive expression. Show that at normal pressure, Langmuir's unimolecular adsorption isotherm become identical with Freundlich - adsorption isotherm. 8½
6. (a) What is meant by catalytic activity? How can it be determined? 3½

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- (b) Discuss the kinetics of heterogeneous reactions at solid surface. 5
7. Derive expression for BET isotherm. How surface area of adsorbent can be estimated using BET equation. 8½
8. Write a note on the followings :
- (a) Salt effects. 4½
- (b) LEED method to determine surface structure. 4

SECTION-C

9. Answer the following in short :
- (i) Can desorption activation energy be negative? Comment.
- (ii) Discuss the pH-dependence of rate constants of catalysed reactions.
- (iii) Define wetting.

- (iv) What are micelles. Discuss their significance.
- (v) What is meant by Sedimentation equilibrium? Explain.
- (vi) Explain Syndiotactic polymers.
- (vii) Discuss briefly applications of surfactants.
- (viii) Explain Amorphous polymers.
- (ix) Define diffusion constant. Also discuss its significance.
- (x) Explain Adsorption Isotherm and Adsorption Isostere.
- (xi) Explain the terms : Sorption, Adsorption, Chemisorption and Physisorption.

11×2 = 22