

Question bank (G scheme)

Name of Subject: chemical reaction engineering

Subject code: 17562

Semester: Fifth

Course: CH

Unite test -1

Chapter 1: Catalysis(12marks)

3 marks question

1. Explain the role of promoters with eg.
2. Define activity and specificity with respect to catalyst
3. Explain the role of inhibitors with eg

4 marks question:

4. State four methods for regenerating the catalyst.
5. Explain the precipitation method for the preparation of catalyst
6. Explain the mechanism involved in solid catalyzed reactions
7. What is hot spot formation in a fixed bed reactor? How it can be prevented?

Chapter 2: Thermodynamics (18 marks)

3 marks question

8. Define chemical kinetics and chemical thermodynamics.
9. Define internal energy and Gibb's free energy.
10. Explain the significance of ΔG .

4 marks question:

11. Define chemical potential and fugacity. Give the mathematical statement.
12. Prove that $\Delta G = -RT \ln K$.

13. Based on Van't Hoff equation, show that for endothermic reaction decrease in temperature is not desirable.
14. Derive the relation between k_p and k_y .
15. Derive the relation between conversion and equilibrium constant for the first order reaction of the type $A \rightarrow R$
16. Derive the expression for entropy change for isothermal expansion of an ideal gas..

Chapter 3: Kinetics of Homogeneous Reactions (22 marks)

3 marks question

17. Define rate of reaction and rate constant.
18. Define chain reaction and non chain reaction
19. Define activation energy. Draw the graph showing the activation energy for endothermic and exothermic reaction.
20. Give the statement of Arrhenius law and explain the terms.

4 marks question:

21. Explain multiple reactions with eg.
22. Differentiate between order and molecularity of reaction
23. Differentiate between elementary and non elementary reaction
24. Explain the types of intermediates formed in a non chain reaction.
25. Rate constant at 27°C is 0.001min^{-1} and at 37°C is 0.002min^{-1} . Find the activation energy of reaction.

