Question Bank

Program: CH
Semester: Sixth
Name of course: Mass Transfer Operations
Course code: 22609

Unit Test 2

Chapter 3 Liquid- liquid extraction (08 marks)

2 marks question

1. Define 1) distribution coefficient 2) selectivity.
2. Draw a neat diagram of mixer settler.
3. Define extract phase and raffinate phase.
4. State the cases where extraction is preferred (any 2).

4 marks question

5. Compare distillation and liquid- liquid extraction as separation techniques.
6. Explain briefly selection criteria for solvent to be used for liquid- liquid extraction.
7. Explain triangular diagram.
8. Explain construction and working of rotating disc contactor.

Chapter 4 Drying (14 marks)

2 marks question

9. Define 1) Equilibrium moisture content 2) Critical moisture content.
10. Give application of spray drier.
11. Draw diagram of drum drier.
12. Give any two differences between drying and evaporation.

4 marks question

13. State and explain the factors on which rate of drying depends.
14. With neat diagram explain construction of tray drier.
15. Draw rate of drying curve and mark the following. 1) constant rate period 2) Falling rate period 3) Critical moisture content 4) Equilibrium moisture content
16. Derive the expression for time required for drying under falling rate period.
17. Explain working of spray drier.
18. A 50 Kg batch of granular solids containing 25 % moisture is to be dried in a tray drier to 12% moisture by passing a stream of air. If rate of drying is 0.0008 Kgmoisture/m^2sec, and critical moisture content is 10%,calculate drying time. Area available for drying is 1 m^2.

Chapter 5 Crystallization (12 marks)

2 marks question

19. State the effect of slow cooling and rapid cooling on crystal formation.
20. Define 1) nucleation 2) growth of crystals.
21. Give application of 1) Vacuum crystallizer and 2) Oslo (Krystal) crystalliser
22. Define solubility.
23. Explain solubility curve

4 marks question

24. Explain various methods of attaining super saturation.
25. Explain Construction of Swenson Walker crystallizer.
26. Explain construction and working of agitated tank crystallizer.
27. A solution of sodium nitrite in water contains 48% $NaNO_3$ by weight at 313K. Calculate the yield of $NaNO_3$ crystals that may be obtained when temperature is reduced to 283K. Solubility of $NaNO_3$ in water at 283K is 80.8 kg $NaNO_3$ per 100 kg water.