Question Bank (G scheme)

Name of subject: Mass Transfer Operation   Unit Test :I

Subject code:17648   Course : CH

 Semester: VI

Chapter 1Diffusion.(8 marks)

3 marks questions

1. Define Fick's law of diffusion. Give its mathematical expression and explain the terms involved in it.

2. Give the expression for steady state diffusion of A through non diffusing B

and explain the terms involved

3. Give the expression for steady state equimolar counter diffusion and explain the terms involved

4 marks question

4.Explain Film theory in diffusion

5.A large tank filled with a mixture of gases A and B at 101KPa and 298K is connected to another tank with A and B at 101 KPa and 298K. The tanks are connected by a tube of diameter 50mm and 150 mm long. Calculate the steady state rate of transport of A through the tube when concentration of A in one tank is 90% and other is 5mol%. D_{AB} =4.3x10^{-3} m^2/sec

Chapter 2 Distillation (34 marks)

3 marks question

1. Draw the boiling point diagram for maximum boiling azeotrope

2. Define 1. Dalton's law 2.Raoult's law

3. Draw boiling point diagram for benzene-toluene mixture.

4. Define 1. External reflux ratio 2. Internal reflux ratio

5. Give the expression to generate x-y data from vapour pressure data.

6. Define distillation. Why simple distillation is also known as differential distillation.

7. Define 1. Volatility 2. Relative volatility

4 marks questions

8. Explain azeotropic distillation in detail.

9. For relative volatility = 2.1, calculate x-y data.

10. Draw a neat labeled diagram of continuous rectification unit.

11. Define the term 'q' in distillation. Give the values of q for different feed conditions.

12. Explain the steps for finding out the number of stages required for distillation using McCabe Thiele method.

13. Compare minimum reflux ratio and maximum reflux ratio.

14. Give Rayleigh's equation and explain the terms involved.

15. Draw a neat diagram of bubble cap tray.

16. Draw q line for different feed conditions

17. A feed of 50 mol% hexane and 50 mol % octane is fed to pipe still through a pressure reducing valve and then into a flash disengaging chamber. The vapour and liquid leaving the chamber is in equilibrium. If the fraction of feed converted to vapour is 0.5, find the composition of the top and bottom products.

X	1	0.69	0.4	0.192	0.045	0
y	1	0.932	0.78	0.538	0.1775	0

18. Explain differential distillation.

19. Which are the various methods of distillation? Which is best and why?

20. Explain optimum reflux ratio.