

Printed Pages : 3

TCH - 601

33

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 9264

Roll No.

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B. Tech.

(SEM. VI) EXAMINATION, 2008-09

MASS TRANSFER - II

Time : 3 Hours]

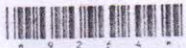
[Total Marks : 100

- Note :
- (i) Assume data where every necessary.
  - (ii) Use of the graph paper is allowed.

1 Attempt any four parts : 5×4=20

- (a) Prove that  $\alpha = P_A^0 / P_B^0$
- (b) Draw  $P-x-y$ ,  $T-x-y$  and  $x-y$  diagram for maximum boiling Azeotrope.
- (c) Draw  $P-x-y$ ,  $T-x-y$  and  $x-y$  diagram for minimum Boiling Azeotrope.
- (d) Prove that  $y = \frac{\alpha x}{1 + (\alpha - 1)x}$
- (e) A mixture of benzene and toluene boils at 368 (K) (95°C) under a pressure of 101.325 kPa. Determine the composition of the boiling liquid assuming that mixture obeys Raoult's law. At 368 K V.P. of Benzene 155.56 kPa and toluene 63.98 kPa.

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[Contd..

- (f) Calculate the equilibrium compositions of the liquid and the vapor phases for a mixture of methanol and water at a temperature of 323 K (50°C) and under a pressure of 40 kPa.

V.P. of methanol at 50°C = 53.32 kPa

V.P. of water at 50°C = 12.33 kPa.

2 Attempt any two parts : 10×2=20

- (a) Derive the equations of feed line in McCabe Thiel method and draw a diagram to show the effect of feed condition on feed line.
- (b) A mixture of Benzene and Toluene containing 40 % benzene and 60% toluene is to be separated in fractionating column to give product containing 96% benzene and a bottom containing 95% toluene feed is a mixture of 2/3rd vapor and one third liquid. Find out the number of theoretical stages required if reflux ratio is 1.5 times the minimum and  $\alpha = 2.5$ .
- (c) Explain Ponchon Savarit method with diagram and derive the equations.

3 Attempt any four parts : 5×4=20

- (a) Define selectivity and state what it indicates.
- (b) Write in brief on rotating disk contractors.
- (c) Explain in brief the construction and working of batch operated mixer and settler.
- (d) Explain in brief, triangular diagram for system with one pair partially miscible.
- (e) Write short notes on super critical fluid extraction.
- (f) Explain in detail the cases where liquid liquid extraction is preferred over distillation.

4 Attempt any two parts :

10×2=20

- (a) Define preparation of the solid in leaching and differentiate b/w Inplace and Heap leaching.
- (b) Explain with diagram the Shank system and Rotocel.
- (c) Draw and explain the different types of equilibrium curve which may be encountered in leaching.

5 Attempt any two parts :

10×2=20

- (a) Why unsteady state fixed bed Adsorbers are preferred over steady state operations. Explain with diagram the adsorption wave.
- (b) Compare Brunavers five types of adsorption isotherms for pure gases.
- (c) Describe major methods for regenerating adsorbent and what are the most commonly used adsorption isotherms for gases and liquids. Explain in brief.

