1st Periodical Test

Chem. Engg.-II

M.Sc (Ind. Chemistry) 1st year Date-07-6-2021

Note: Attempt all questions. M. Marks-20

Q1 Write the different mass transfer operations. (4)

Q2 Develop the interrelationship between individual mass transfer coefficients and overall mass transfer coefficient. (4)

Q3 The absorption of solute A from a mixture is done in a wetted wall column by a solvent at 1 atm. And 25 ^{0}C. The value of mass transfer coefficient is 9 x 10^{-4} m/s. At a point, the mole fraction of A in the liquid gas interface is 2 x 10^{-5} in the liquid phase. Partial pressure of A in the gas phase is 0.08 atm. Henry's law relation is $p_A = (600)x_A$ in atm. Calculate the rate of absorption of A. (4)

Q4 Discuss the different distillation methods and their applications. (4)

Q5 A cylindrical hot gas duct, 0.5 m inside radius, has an inner layer of fireclay bricks (k = 1.3 W/m ^{0}C) of 0.27 m thickness. The outer layer, 0.14 m thick, is made of a special brick (k = 0.92 W/m ^{0}C). The brickwork is enclosed by an outer steel cover which has a temperature of 65 ^{0}C. The inside temperature of the composite cylindrical wall of the duct is 400 ^{0}C. Neglecting the thermal resistance of the steel cover, calculate the rate of heat loss per metre of the duct and also the interface temperature between the ceramic layers. What fraction of the total resistance is offered by the special brick? (4)