CE 329, Fall 2015

Assignment 30

Problem Statement

Pure butanol is to be fed into a semi-batch reactor containing pure ethyl acetate to produce butyl acetate and ethanol. The reaction is elementary and reversible. The reaction is carried out isothermally at 300K. At this temperature the equilibrium constant is 1.08 and the rate coefficient is 9.0×10^{-5} dm^3 mol^{-1} s^{-1}. Initially there are 200 dm^3 of ethyl acetate in the vat and butanol is fed at a rate of 0.05 dm^3 s^{-1}. The pure concentrations of butanol and ethyl acetate are 10.93 mol dm^{-3} and 7.72 mol dm^{-3}, respectively. Plot the moles of each species in the reactor versus time.