

CE 329, Fall 2015
Assignment 29

Problem Statement

Irreversible reaction (1) takes place in the liquid phase with a rate that is second order in the reactant. Suppose an isothermal recycle PFR was going to be used for this reaction and that it would operate at a temperature where the rate coefficient has a value of $193 \text{ ft}^3 \text{ lbmol}^{-1} \text{ h}^{-1}$. The stream to be processed has a flow rate of $21.2 \text{ ft}^3 \text{ h}^{-1}$ and contains 0.075 lbmol of A per ft^3 . The PFR is 10 ft long and has a diameter of 4.4 inches. What will the overall conversion equal if the recycle ratio is zero? What will the overall conversion equal if the recycle ratio is 0.5?



(1)