University of Kentucky
Chemical & Materials Engineering Department
CME 550: Chemical Reactor Design
Homework 5

Due at *beginning* of class on Wednesday, October 12, 2005
Partial credit will be given in ½-point increments.

1) Levenspiel 5.23 [2 pt]

2) Levenspiel 5.30 [2 pt]

3) Your first day at your new job, you discover that your predecessor shut down a critical MFR. Your predecessor left in a hurry, and did not leave much information about the reactor. At steady state, you know that when 0.833 L/s of feed entered the reactor, the yield of the product was 85%, and that the product stream contained 0.6 mol/L of product. The reactor can hold 1000 L of liquid. The reaction occurring is first order. When you restart the reactor, assuming that it is initially filled with the solvent (water), how long will you have to run the reactor before the exiting stream reaches 95% of the steady-state concentration of product again? [1 pt]

4) Levenspiel 6.3 [1 pt]

5) Levenspiel 6.7. Minimize the total volume of the pair of reactors [2 pt]

6) Levenspiel 6.11 [2 pt]