Ch En 386 Exam 2 Review

Information from Exam 1 Review may still be needed on Exam 2.

1. Recognize the relationships between conversion, extents of reaction, concentration, moles, and molar flow rates. Know the limitations and benefits for solving design equations in terms of conversion, extents, flow rates, moles, or concentrations. The definition of conversion and extent are usually only used for batch reactors and steady state flow reactors. For non steady state flow reactors, don’t use extent or conversion when solving the equations. Remember, there is only one  for each reaction, whether the reaction is reversible or irreversible.
2. Write the batch reactor design equations in terms of conversion, extents of reaction, concentrations, or moles. Understand when batch design equations in terms of concentrations can and cannot be used.
3. Write the CSTR (steady state) or PFR (steady state) design equations in terms of conversion, extents of reaction, concentrations, or molar flow rate. Recognize the difference (or similarity) between inlet concentrations, reactor concentrations, and outlet concentrations.
4. Write the unsteady state CSTR (or semi-batch) design equations in terms of concentrations. Know how to implement changing volume if needed. Recognize the difference (or similarity) between initial concentrations, inlet concentrations, reactor concentrations, and outlet concentrations.
5. Know the relationship of pressure in a PBR relative to the inlet pressure and how this can be applied to a changing volumetric flow rate.
6. Solve simple batch, CSTR (steady state), and PFR problems by hand. Solving will allow you to answer questions regarding information related to time, reactor size, conversion, etc.
7. Solve (including by hand) non-steady state CSTR design equations for liquid reactions when the volume is constant (this is referred to as start-up).
8. Solve (including by hand) non-steady state CSTR design equations for liquid reactions when the volume is not constant.
9. Solve (including by hand) non-steady state semi-batch design equations for liquid reactions. Know the implied assumptions associated with predicting the volume change.
10. Solve PBR problems when pressure drop occurs. In some cases, know how to solve these problems by hand.
11. Know how to include mass transfer in any reactor system.
12. Know how to incorporate multiple reactions into solving reactor problems.
13. Know the definitions of instantaneous and overall yields and selectivities and how selectivities can be used to choose types of reactors.
14. Know how to integrate, including the use of the integrating factor. Full credit will only be given on an exam when integrating by hand. Know simple integration since you will not have your book. Integrating using calculators will only give partial credit.
15. Show how to set up PFR and batch reactor problems using Polymath.