

CE 329, Fall 2015

Assignment 20

1. If an adiabatic CSTR is used for an irreversible, highly exothermic reaction with typical kinetics, as the space time increases, the reaction rate will
 - a. remain constant
 - b. continually increase
 - c. increase, pass through a maximum, then decrease
 - d. continually decrease
 - e. decrease, pass through a minimum, then increase
2. If an adiabatic batch reactor and an adiabatic CSTR are each used for an irreversible, highly exothermic reaction with typical kinetics with the initial batch reactor composition and temperature equal to the CSTR feed composition and temperature, then at small, equal values of the batch reactor processing time and the CSTR space time
 - a. the CSTR outlet temperature will be greater than final batch reactor temperature
 - b. the CSTR conversion will be smaller than the batch reactor conversion
 - c. the final rate of reaction in the batch reactor will be equal to the reaction rate in the CSTR
 - d. the concentration of the limiting reagent at the end of the batch reactor process will be smaller than the CSTR outlet concentration of that reagent
 - e. the batch reactor will explode, but the CSTR will not
3. If the reaction is $A + B \rightarrow Y + Z$ and occurs in the gas phase in a CSTR
 - a. the total molar flow rate at the outlet will be greater than at the inlet
 - b. the total molar flow rate at the inlet will be greater than at the outlet
 - c. the temperature at the inlet will equal that at the outlet
 - d. the rate of heat transfer will vary continually
 - e. the outlet volumetric flow rate will be greater than the inlet volumetric flow rate
4. If a single, first-order, irreversible, liquid phase reaction takes place isothermally in a steady state CSTR, and if the inlet volumetric flow rate is doubled, the conversion will
 - a. increase
 - b. decrease
 - c. stay the same
 - d. first increase, and then decrease
 - e. first decrease, and then increase
5. During an exothermic reaction in an isothermal, steady state CSTR, the rate of heat transfer, \dot{Q} , will be
 - a. positive and constant
 - b. negative and constant
 - c. positive and increasing over time
 - d. negative and decreasing over time
 - e. positive and decreasing over time