

CE 329 Fall 2015
Class 26 Worksheet

Suppose reaction (1) and reaction (2) are typical irreversible reactions and further assume that they have exactly the same rate expression (same reaction orders, same pre-exponential factor and same activation energy). In fact, the only difference between them is that reaction (1) is exothermic and reaction (2) is endothermic. Make a single graph showing conversion of A versus space time, and on that graph sketch what the plot would look like (a) for reaction (1) taking place in an adiabatic PFR, (b) for reaction (1) taking place in an isothermal PFR, (c) reaction (2) taking place in an adiabatic PFR and (d) reaction (2) taking place in an isothermal PFR. For each plot explain why it has the shape it does, and then explain why the plots differ from each other in the way they do.



Key plot features you should incorporate and justify

- initial values, slopes and curvature
- additional inflection points, maxima, etc. (if needed in order to asymptotically approach equilibrium)
- relative curve positions, crossings, etc.