ChE 344
Week 12
Problem Set 18
Due Tuesday, March 26, 2013 (Lecture 19)
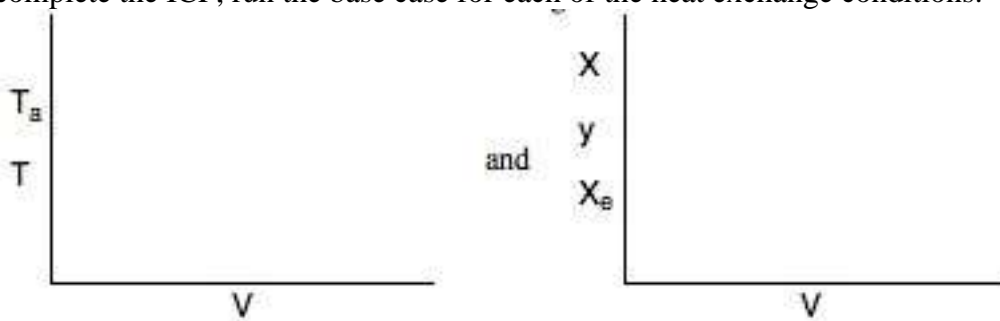

<u>**Individual Assignment**</u>

1. PLQ 19 - What are Kappa, T_C and C_{Po}? Why are there three pathways (branches) in Figure 12-3 on page 549?

<u>**Group Assignment**</u>

Continuation of Class problem from March xx, 2013

1. Return to In Class Problem 14 on Tuesday, March 15, 2013 and also P12-3$_B$. If you did not complete the ICP, run the base case for each of the heat exchange conditions.

For each case (adiabatic, constant T_a, co-current variable T_a, and counter current variable T_a) Explain why each of the curves look the way they do. Explain the minimums, maximums or changes in slopes. E.g., why does the X_e reach a minimum in the figure below?
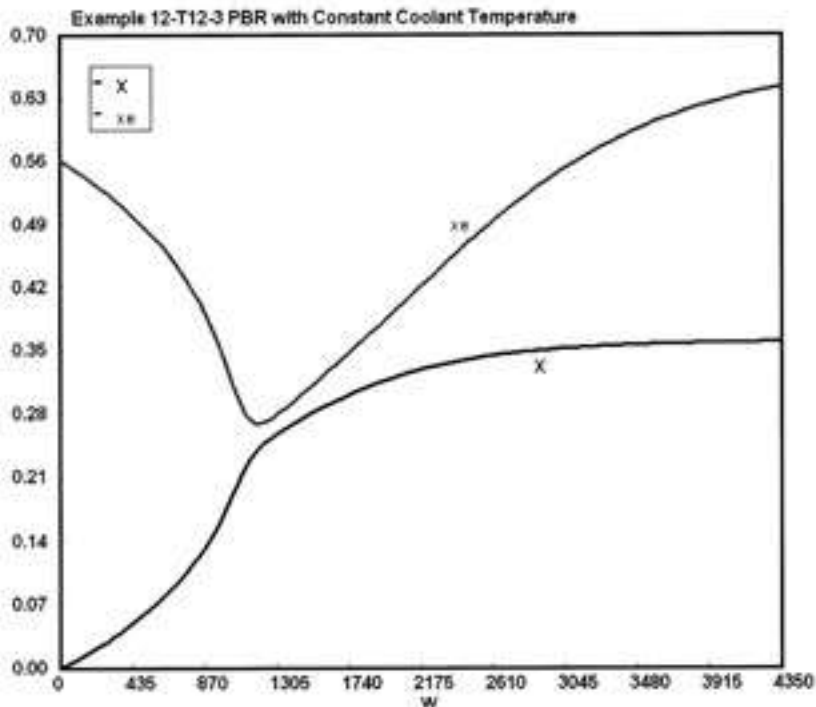
Note if you did not finish the In Class Problem, the solution to Tuesday's (3/xx/13) is now on CTools.

2. Fill in the following table of exit and maximum conditions. Explain any differences between the curves.

Type of Heat Exchange	X	X_e	y	T_a	T	T_{max}
Adiabatic						
Constant T_a						
Co-Current						
Counter Current						

Individual Assignment

1. $P12-3_B$ - omit parts (h) and (i).

   P584-585 Typos
   Problem $P12-3_B$ <u>Base Case</u>
   $\Theta_B=1$
   $T_{ao}=320$ K
   $\dot{m}_c=1000$ mol/s
   $K_C=100$ @ 303 K
   (f) Change to mol/s
   $1.0 \leq \dot{m}_c \leq 1,000$ mol/s

   Load the LEP. Develop a personal relationship with this reactor and reaction. Find out all you can about it by carrying out the parameter variation. **Save paper!** Only print out the graph for the base case and show(sketch) trends relative to the base on the base case graph for each of Parts (a) through (g).

   (a) Plot X, y, X_e at the exit versus FA0 and explain any maximum or minimum values.
   (b) Plot X, y, X_e at the exit versus ΘI and explain any maximum or minimum values.
   (c) Plot X, y, X_e at the exit versus T0 and explain any maximum or minimum values.
   (d) Plot X, y, X_e at the exit versus Ta and explain any maximum or minimum values.
   (e) Plot X, y, X_e at the exit versus for $1.0 \leq \dot{m}_c \leq 10,000$ mol/s and explain any maximum or minimum values.
   (f) Plot X, y, X_e at the exit versus and note any maximum or minimum values.
   Write down and describe all the trends you found of the things that affect your reactor.

2. $P12-7_B$

3. $P12-21_B$

ProblemSets.docx