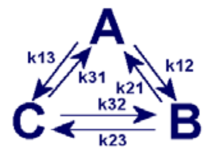
ChE 7033 Homework # 2 Due: Sept. 12, 2011

Each problem is worth 25%

1. Do problem 1.1 in Froment, Bischoff, and DeWilde

2. Do problem 1.12 in Froment, Bischoff, and DeWilde

3. For the three component, reversible reaction we have been working on in class with $k_{12} = 6$, $k_{23} = 1$, $k_{13} = 1$, $k_{21} = 1$, $k_{32} = 2$, $k_{31} = 3$. Find $A = f_1(t)$, $B = f_2(t)$, and $C = f_3(t)$ for $C_{A0} = 1$, $C_{B0} = 0$, $C_{C0} = 0$. Plot the result (all three concentrations on one graph) for the time period required to reach about 98% of equilibrium conversion.



4. Use the method of Kittrell, Mesaki, and Watson [Industrial Engineering Chemistry 50 (1966)] to obtain the best reaction order and rate constant for the following data:

CONCENTRATION(MOLES/LT)

T(MIN)	RUN1	RUN2	RUN3	RUN4	RUN5	RUN6	RUN7	RUN8	RUN9
0.000	.630	.698	.809	.891	.998	1.101	1.204	1.287	1.391
1.000	.554	.605	.624	.734	.834	.937	1.006	1.024	1.088
2.000	.441	.481	.563	.621	.648	.714	.747	.796	.875
3.000	.390	.435	.493	.529	.545	.647	.655	.708	.711
4.000	.347	.390	.402	.446	.484	.482	.534	.597	.598
5.000	.305	.281	.348	.394	.435	.434	.469	.519	.501
6.000	.235	.281	.339	.315	.344	.380	.422	.439	.422
7.000	.231	.260	.306	.306	.299	.373	.353	.358	.386
8.000	.221	.244	.210	.277	.270	.294	.329	.308	.315
9.000	.177	.203	.218	.255	.232	.288	.301	.273	.306

CONCENTRATION(MOLES/LT)

T(MIN)	RUN10	RUN11	RUN12	RUN13	RUN14	RUN15	RUN16	RUN17	RUN18
0.000	1.493	1.609	1.689	1.794	1.900	2.005	2.122	2.213	2.303
1.000	1.157	1.234	1.288	1.383	1.424	1.504	1.584	1.666	1.686
2.000	.949	.986	1.036	1.049	1.135	1.150	1.197	1.202	1.227
3.000	.790	.847	.799	.875	.910	.927	.958	.976	1.011
4.000	.637	.650	.678	.707	.743	.782	.803	.812	.811
5.000	.534	.579	.542	.616	.588	.624	.664	.673	.714
6.000	.459	.497	.489	.493	.526	.547	.548	.554	.561
7.000	.422	.379	.394	.432	.455	.460	.478	.460	.499
8.000	.352	.359	.343	.416	.337	.394	.440	.414	.440
9.000	.275	.328	.331	.353	.327	.328	.345	.357	.354