

A.P. CHEM ASSIGNMENT SHEET #6

KINETICS

Read Chapter 13 in Chang

Note Table 13.3; note the nifty *Chem in Action* on page 568; note Figure 13.17; note the *Chem in Action* on page 580; note Figure 13.28; note Figure 13.29.

From Chang pages 589-598, answer the following:

6, 8, 11, 12, 15, 16, 17, 18, 19, 20, 21, 24, 25, 27, 28, 30, 33, 34, 35, 36, 38, 39, 40, 42, 44, 45, 46, 48, 49, 50, 51, 52, 53, 54, 59, 60, 62, 63, 64, 66 (only if you're in the mood; ask Coakley to talk about grain elevator explosions), 68, 69, 72, 75, 76, 80 (forget part b), 81, 82, 83, 86, 87 (see Figure 13.6, page 550 for a hint), 88, 89, 90, 91, 92, 93 ab, 97, 98, 102, 109, 110, 123

From your APQ packet, answer questions **6, 12 b-e, 17 de, 22, 33, 37, 56, 61**, and **62**, as well as the following:

APQ #601

"The overall order of a reaction may not be predictable from the stoichiometry of the reaction."

a.) Explain how this statement can be true.

b.) Consider the reaction: $2 XY \rightarrow X_2 + Y_2$

1. For the hypothetical reaction above, give a rate law that shows that the reaction is first order in the reactant XY.
2. Give the units for the specific rate constant for this rate law.
3. Propose a mechanism that is consistent with both the rate law and the stoichiometry.

Kinetics Unit Outline

1. reaction rates; reaction rates \neq constant; reaction rates and stoichiometry
2. differential rate laws (concentration and initial rate); rate = $k[A]^x[B]^y$; rate constant (k) and its units; orders
3. integrated rate laws (concentration and time); 1st order and 2nd order equations only; half-life ($t_{1/2}$)
4. collision theory; factors that affect reaction rates (temperature, concentration, catalysts, surface area-to-volume ratio); Maxwell-Boltzmann curve; activation energy (E_{act}); activated complex; reaction profile (PE diagram); catalysis; Arrhenius equation
5. reaction mechanisms; molecularity; elementary step; multi-step; intermediates; rate determining step (RDS); multi-step reaction profile; catalysts and zero order reactants