IB2 HL Chemistry

5. Kinetics

Read: Zumdahl[2] Chapter 12 Sections 1-3 (ignore referenec to integrated rate law), 4 (only pp. 570-573, half-life of first order reactions), 5-8 (you do NOT need to be able to calculate A or E_a but must be able to describe how to do it)

Concepts to be mastered:

To master a concept, you must be able to do three things:

1. define the concept,
2. explain the concept, and
3. give an example of the concept.

- rate of reaction, average rate, instantaneous rate, activation energy, collision theory, mechanism, elementary reactions, molecularity
- forward and reverse reactions, forward and reverse activation energies, rate law, rate constant, activated state, transition state, activated complex
- Maxwell-Boltzmann distribution, catalysis, homogeneous catalyst, heterogeneous catalyst, order of a chemical reaction, order of a chemical reaction with respect to a particular chemical species

Skills to be mastered:

To master a skill, you must be able to

1. recognize when the skill is needed,
2. recognize what information is needed to execute the skill,
3. execute the skill, and
4. assess whether the skill has been executed correctly.

	Zumdahl[2]
• Relate the relative values of forward and reverse activation energies to a reaction being exothermic and endothermic	49-52,
• Compare forward and reverse reaction rates based upon forward and reverse activation energies	51-52
• Determine the rate law and rate constant for a chemical reaction from initial rate data	6, 7, 21-26, 71, 73,
• Write the rate law for a given elementary reaction	45, 48
• Determine half-life for first order reactions	
• Relate rate law to mechanism for one or two step reactions	61
• Determine rate for a reaction given appropriate data	17, 18. 65
• Explain the dependence of reaction rates with concentration, temperature and surface area based upon the collision theory	5
• Explain the application of the equilibrium principle and kinetics in the Haber process for the synthesis of ammonia and contact process for the synthesis of sulfuric acid	

Additional Problems: 9-16, 19, 20, 62, 74.