

Chapter 14 – Chemical Kinetics (Syllabus)

Chemistry: The Central Science

(pgs. 568-621)

1. Read the chapter a minimum of a couple of times (including all the Sample & Practice Exercises). You will definitely see kinetics-related questions on the AP Exam!!
2. 14.1 (Factors that Affect Reaction Rates): 4 factors
3. 14.2 (Reaction Rates):
 - In a reaction, typically how does the rate of a reaction change over time?
 - Avg. rate vs. instantaneous rate
 - How do reaction rates relate to the stoichiometry of an equation?
 - Ch. 11-Intermolecular forces
4. 14.3 (Concentration and Rate):
 - Take “A Closer Look - Using Spectroscopic Methods to Measure Reaction Rates: Beer’s Law” (pg. 576)
 - Terms: rate law, rate constant, reaction order
 - How can the units for the rate constant vary? Explain.
 - This will take a lot of practice with the problems.
5. 14.4 (Change in Concentration over Time):
 - Terms: zero, first, and second-order reactions, half-life (See again in Ch. 21)
 - Look at the AP Equation Sheet to see what formulas will be given on the exam.
 - This will also take a lot of practice with the problems.
6. 14.5 (Temperature and Rate):
 - ✓ Terms: collision model (based on kinetic-molecular theory), activation energy, activation complex (transition state), Arrhenius equation, frequency factor
 - ✓ Look at the AP Equation Sheet to see what formulas will be given on the exam.
7. 14.6 (Reaction Mechanisms):
 - These concepts will explain how reactions occur.
 - Terms: reaction mechanism, elementary steps, molecularity (uni-, bi-, & ter-), intermediate, rate-determining step
8. 14.7 (Catalysis):
 - ✚ What’s the function of a catalyst?
 - ✚ What are the 2 types of catalysts?
 - ✚ Biology application: Enzymes
9. Labs:
 - ❖ LabQuest 25: The Rate and Order of a Chemical Reaction
 - ❖ LabQuest 12: Decomposition of Hydrogen Peroxide (H_2O_2)
10. Chapter 14 Focus Problems:
 - Visualizing Concepts & Exercises: #'s 2, 17, 21, 23, 31, 33, 35, 41, 43, 47, 49, 53, 55, 61, 63, 67, 69, 71, 73, 79, & 87
 - Additional Exercises: #'s 91, 93, 98, 99, 101, 103, 104, 108, & 110
 - Integrative Exercises: #'s 117, 118, & 120
11. Ch. 14 Test: The test will be in about 2 weeks and will be about a 100 pt. test & will contain at least 1 AP Exam question.