AP Chemistry Chapter 16 Essentials Part 1

<u>KINETICS – The Rate of Reaction</u>

    1.   What is chemical kinetics?

    2.   What does the rate of reaction describe?

    3.   Do chemical reactions all occur at the same rate? If not, describe the difference.

    4.   What is the difference between thermodynamics and kinetics?

    5.   Compare the reaction of HCl with $Mg(OH)_2$ with $C_{(diamond)}$ and O_2. How are they similar, how are they different?

    6.   How are reaction rates determined?

7. How can spectroscopic methods be used to determine rates of reactions?

8. How can the mole ratios from a balanced chemical equation be used to determine the rates of reaction?

9. What are the 4 factors that affect reaction rates? Explain how the effects of each of these factors can control the rates of reaction.

10. What is a rate-law expression and how is it determined?

On a separate piece of paper answer questions 11-14

11. Do the orders (exponents) in the rate law expression always match the coefficients in the balanced equation? Is there a way to predict them or must they be determined experimentally?

12. What happens to the rate constant, k, of a given reaction with regards to the following conditions- changes in concentration, over the duration of the reaction, changes in temperature and use of a catalyst?

13. What is the "method of initial rates" used for?

14. Explain how you would determine the rate expression for this hypothetical reaction given its experimental data.

$$A + 2B \longrightarrow C$$

Experiment	Initial [A] (M)	Initial [B] (M)	Initial Rate of Formation of C ($M \cdot s^{-1}$)
1	1.0×10^{-2}	1.0×10^{-2}	1.5×10^{-6}
2	1.0×10^{-2}	2.0×10^{-2}	3.0×10^{-6}
3	2.0×10^{-2}	1.0×10^{-2}	6.0×10^{-6}