Assignment 1

Section 3 - Kinetics of Homogeneous Reactions

1. Describe how activation energies are calculated.
2. What is the rate constant for an elementary reaction?
3. Derive the Arrhenius equation for a reaction.
4. Describe how temperature affects reaction rates.

Section 4 - Initial Velocity and Reaction Rate

5. Calculate the rate constant for the reaction: 2NO(g) + 3O2(g) → 2NO2(g).
6. Calculate the activation energy for the reaction: A + B → C + D.
7. What is the order of a reaction?

Section 5 - Factors Affecting Reaction Rates

8. Explain how catalysts affect reaction rates.
9. Describe how pressure affects reaction rates at constant volume.
10. Describe how pressure affects reaction rates at constant pressure.

Final Exam

11. A reaction is second order with respect to A. If the concentration of A is doubled, the rate of the reaction increases by 4 times. What is the order of the reaction with respect to A?
12. A reaction is first order with respect to B and second order with respect to C. If the concentration of B is tripled and the concentration of C is doubled, the reaction rate increases by 12 times. What is the overall order of the reaction?

[Answers provided for each question.]