

Kinetics (Reaction Rate) Practice

Name: _____ Pd: _____

1. Complete the following concept map using the following terms:

Surface area

Temperature

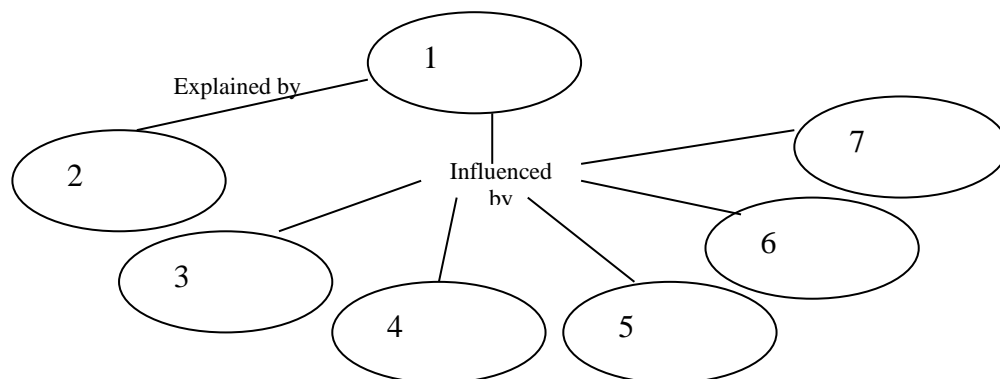
Concentration

Catalyst

Collision theory

Reaction rates

Reactivity



2. Define reaction rate. What does the reaction rate indicate about a particular chemical reaction?

3. In addition to colliding, what else must happen in order for a reaction to occur?

4. Use the collision theory to discuss how the following factors affect the rate of a chemical reaction:

a. Temperature

b. Concentration

c. Surface area

5. What role does the reactivity of the reactants play in determining the rate of a chemical reaction?

6. Answer the following questions about catalysts:

a. What is the difference between a homogeneous and a heterogeneous catalyst?

b. How does a catalyst affect the activation energy for a chemical reaction?

c. What is the result of adding a catalyst to a reaction?

7. Would the changes listed below increase or decrease the rate of the following reaction:

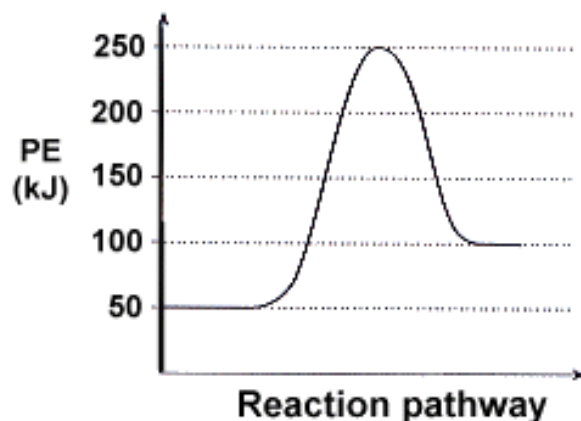


a. decreasing temperature _____ c. crushing I_2 _____

b. Increasing $[\text{Cl}_2]$ _____ d. adding a catalyst _____

Activation Energy Diagrams

Use the graph below to answer questions 1-7: Include labels on any numerical values.



1. Label the position of the **reactants** on the graph.
2. Label the position of the **products** on the graph.
3. Label the position of the **activated complex** on the graph.
4. How much energy do the reactants have at the start of the reaction? _____
5. What is the activation energy for this reaction?
_____ Label this on the graph.
6. How much energy do the products have at the end of the reaction? _____
7. Is this reaction exothermic or endothermic? Explain your answer using evidence from the graph.
8. Draw an energy diagram on the axes below using the given information. Be sure to include labels and units on both the x-axis and y-axis.

Potential energy of reactants = 350 kJ/mole

Activation energy = 100 kJ/mole

Potential energy of products = 250 kJ/mole



9. Is this reaction exothermic or endothermic? Explain your answer using evidence from the graph.
10. You add a catalyst to the reaction you graphed in question 8, which lowers the activation energy of the reaction from 100 kJ/mole to 50 kJ/mole. Draw the energy diagram of the catalyzed reaction on the same set of axes above (use a dashed line or a different color and label the reaction with the catalyst).