**TICKET TO THE TEST**

Unit 9 Kinetics

Directions: Answer all questions and show all work. Use your notebook, homework, and videos to help you review all the concepts. I might ask you to come up with your own examples. Do not just copy ones I have done in class or a friend’s example in that case. Make your own. Come after school if you have questions. You should be supplying me with anything you think may be tested. Then, use this as a study sheet. It is due BEFORE the test. **No late tickets will be accepted.** This could be worth up to ten points on the test. The more you show, the more points you get, the more you might actually remember!

1. Explain what two parameters are needed in order for a reaction to be considered effective. Explain why the second collision was not effective in the box below:

**Effective collisions need proper \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



 **Explain:**

1. List and explain the five factors that affect the rate of reaction and how they do it (collision theory):
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Go back into your homework and class packets and find a question about reaction rates that you got wrong the first time. Give the question and explain the correct answer:
3. Pretend you are the teacher. Create a question that you could ask in order to judge if your students know what factors affect reaction rates and why. Create the question and answer.

Question: Answer:

1. Using table I give examples for the following:
	1. Endothermic **reaction**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. Exothermic **reaction**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. Doubling a **reaction** and finding the enthalpy value:
	4. Reversing a **reaction** and finding the enthalpy value:
2. Draw an exothermic and an endothermic potential energy diagram and label with the following with a-e:
	1. Reactants

endo

exo

* 1. Products
	2. Activated complex
	3. Activation energy
	4. Heat of reaction
1. Compare and contrast your two drawings.
2. If values were given, how could you calculate the heat of reaction?

**HEAT OF REACTION =**

1. What factors (a-e) change when a catalyst is added? Why? What does a catalyst do?

**Factors that change with a catalyst: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Role of a catalyst: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. Why do these PE diagrams have a “bump” even though energy is sometimes exothermic and releasing?
2. Give a definition and examples of **ACTIVATION ENERGY: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. If you were the teacher, what additional question would you ask to measure a student’s understanding of PE diagrams?

Question: Answer:

1. Define entropy: **ENTROPY: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. Give examples of:
	1. A **reaction** where entropy increases because of the phases:
	2. A **reaction** where entropy increases because of amounts:
	3. A **reaction** where entropy decreases because of the phases:
	4. A **reaction** where entropy decreases because of amounts:
3. How do changes in temperature affect entropy?
4. What two factors make reactions spontaneous? Give an analogy.

**SPONTANEUOS REACTIONS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Analogy:

1. **What is equal about equilibrium? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. What special sign do equilibrium reactions get?

 (not 🡪 but…)

1. At equilibrium, what happens to the quantities of reactants and products? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Give a word that represents a solution at equilibrium:

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ means a solution is at equilibrium.**

1. Using the following reaction, construct questions about concentration, pressure, volume, catalyst, and temperature changes on the system and then answer them.

**53 kJ + H2(g) + I2(g) 2HI(g)**

Question Answer

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. What topics do you still need to study after completeing this packet? Show me work for additional examples you have done:

**What is your goal grade on this kinetics test? Be reasonable. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Do you really feel you did enough to achieve that goal? Why or why not?**