Reaction Energy & Rate Worksheet

PART A – REACTION ENERGY

1. Fill in the blanks on the reaction coordinate diagram with the appropriate letters. Not all letters will be used
   A. reactants
   B. products
   C. energy released
   D. energy absorbed

Specify whether each reaction is exothermic (EXO) or endothermic (ENDO).

2. _______ The reaction shown in the diagram to the right.
3. _______ The burning of wood to produce a hot flame.
4. _______ 4Fe(s) + 3O_2(g) → 2Fe_2O_3(s) + energy
5. _______ A test tube that feels cold to the touch after two substances have been mixed.

PART B – REACTION RATES

6. Using the reaction coordinate diagram above, draw a new curve that shows how a catalyst would affect the reaction pathway.

Place a checkmark next to the actions that would most likely increase the reaction rate.

7. ____ Lowering the temperature of the reactants.
8. ____ Dissolving two solids in water before mixing them together.
9. ____ Diluting an aqueous solution of HCl with water before adding a piece of magnesium.
10. ____ Grinding a solid into fine particles.
11. ____ Adding an enzyme catalyst.
Potential Energy Diagram Worksheet

1. Which of the letters a–f in the diagram represents the potential energy of the products? _______
2. Which letter indicates the potential energy of the activated complex? _______
3. Which letter indicates the potential energy of the reactants? _______
4. Which letter indicates the activation energy? ______
5. Which letter indicates the heat of reaction? ______
6. Is the reaction exothermic or endothermic? ______
7. Which letter indicates the activation energy of the reverse reaction? ______
8. Which letter indicates the heat of reaction of the reverse reaction? ______
9. Is the reverse reaction exothermic or endothermic? ___

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1. The heat content of the reactants of the forward reaction is about ______ kilojoules.
2. The heat content of the products of the forward reaction is about ______ kilojoules.
3. The heat content of the activated complex of the forward reaction is about ______ kilojoules.
4. The activation energy of the forward reaction is about ______ kilojoules.
5. The heat of reaction (\(\Delta H\)) of the forward reaction is about ______ kilojoules.
6. The forward reaction is __________ (endothermic or exothermic).
7. The heat content of the reactants of the reverse reaction is about ______ kilojoules.
8. The heat content of the products of the reverse reaction is about ______ kilojoules.
9. The heat content of the activated complex of the reverse reaction is about ______ kilojoules.
10. The activation energy of the reverse reaction is about ______ kilojoules.
11. The heat of reaction (\(\Delta H\)) of the reverse reaction is about ______ kilojoules.
12. The reverse reaction is ________________ (endothermic or exothermic).
Ch 17 Worksheet

Potential Energy Diagrams

Complete the following potential energy diagrams and questions.

Potential Energy Diagram

1. Reactant energy = 350 kJ
   Activation energy = 100 kJ
   Product energy = 250 kJ

   $\Delta H = \square$
   
   $E_{ac} = \square$

Potential Energy Diagram

2. Potential energy of reactants = 200 kJ
   Potential energy of activated complex = 400 kJ
   $\Delta H = +150$ kJ

   Activation energy = $\square$
   
   Product energy = $\square$

Potential Energy Diagram

3. Activation energy = 300 kJ
   $\Delta H = +50$ kJ
   Product energy = 150 kJ

   Reactant energy = $\square$
   
   $E_{ac} = \square$