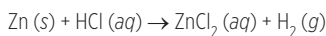


CHAPTER 5 PRACTICE QUESTIONS

Directions: Review what you just learned in this chapter and test your comprehension with these practice questions. Answers can be found directly after the questions.

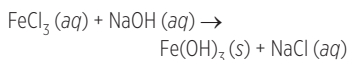
Balancing Chemical equations, Identifying Types of Reactions, and Assigning Oxidation States in a Reaction

- Aluminum metal is added to an aqueous solution of copper (II) sulfate to produce aqueous aluminum sulfate and copper metal. Write a balanced equation for this reaction.
- Consider the following reaction between zinc metal and a solution of hydrochloric acid.



- Balance the above reaction.
- What type of reaction is illustrated here?
- Assign oxidation states to all the atoms in the chemical reaction.
- During the reaction, which element was oxidized and reduced, if any?

- Consider the following reaction between solutions of iron (III) chloride and sodium hydroxide.



- Balance the above reaction.
 - What type of reaction is illustrated here?
 - Assign oxidation states to all the atoms in the chemical reaction.
 - During the reaction, which element was oxidized and reduced, if any?
- What product(s) will be formed in a synthesis reaction between Ca and O₂?

Heat transfer and Calorimetry

- Which process is exothermic?
 - The boiling of liquid nitrogen
 - The freezing of water
 - The sublimation (solid to gas phase change) of dry ice
 - The vaporization of water

DRILL

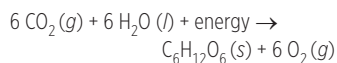
6. A match is held under a beaker of water and ignited. The beaker contains 25.0 mL of water. The initial temperature of the water was 22.5°C and the final temperature of the water was 24.4°C. How much heat was gained by the water while the match burned? (Remember! Water has a specific heat capacity of 4.18 J/g°C and a density of 1.0 g/mL.)

Factors that affect the rate of the reaction

7. A catalyst increases the rate of a chemical reaction by:
- A) lowering the activation energy of the reaction
 - B) increasing the average kinetic energy of the reactants
 - C) decreasing the potential energy difference between the reactants and products
 - D) increasing the number of collisions between the reactant molecules

Potential Energy

8. Living plants use carbon dioxide and water to produce glucose (a simple sugar) via the process of photosynthesis according to this equation:



Is this reaction endothermic or exothermic, and is the value of ΔH positive or negative?