Chemical Reactions

Chapter 14 – 4

Energy And Rates of Chemical Reactions

Essential Questions

- How can exothermic and endothermic reactions be classified?
- What is meant by activation energy?
- What are the five factors that affect the rate of a reaction?

Definitions

- Exothermic reaction – a chemical reaction in which heat is given off
- Endothermic reaction – a chemical reaction that requires heat
- Law of conservation of energy – energy cannot be created or destroyed, but can be changed from one form to another

Definitions, continued

- Activation energy – the minimum amount of energy needed to start a chemical reaction
- Inhibitor – substance that slows down or stops a chemical reaction
- Catalyst – substance that speeds up a reaction without being used up or destroyed

Exothermic Reactions

- Exothermic reaction – a reaction where energy is released
- Released energy can be in many forms: light, heat, electrical, thermal

Endothermic Reactions

- Endothermic reaction – reaction where energy is taken in
- Ex: photosynthesis

Law of Conservation of Energy

- Energy cannot be created nor destroyed

Activation Energy

- Activation energy – smallest amount of energy needed to start a chemical reaction
- Sources: friction, electric spark. light

Rates of Reactions

- Temperature – the higher the temperature, the faster the reaction
- Concentration – the higher the concentration, the faster the reaction
- Surface Area – the more surface area present, the faster the reaction

Rates of Reactions, cont.

- Inhibitors – a substance that slows down or stops a chemical reaction
  - EX: preservatives in food keep it fresh longer
- Catalyst – a substance that speeds up a chemical reaction
  - EX: enzymes speed up the chemical reactions in your body