

Chapter 2 The Nature of Matter ▪ Section 2 Summary

Changes in Matter

Key Concepts

- What is a physical change?
- What is a chemical change?

Chemistry is the study of changes in matter. Matter can change in two ways. In a **physical change**, matter changes its appearance but does not change into a different substance. **A substance that undergoes a physical change is still the same substance after the change.** One example of a physical change is a change in state. Changing from a solid to a liquid or from a liquid to a gas is a change in state. Another example of a physical change is a change in shape or form. Other examples of physical changes are dissolving, bending, crushing, chopping, and filtering.

The other way that matter can change is through a chemical change. In a **chemical change**, matter changes into one or more new substances. **Unlike a physical change, a chemical change produces new substances with properties different from those of the original substances.** Combustion, or burning, is one type of chemical change. Silver tarnishes due to a chemical change. The silver combines with oxygen in the air to produce a new substance called silver oxide. Other examples of chemical changes are electrolysis and oxidation.

Although it may seem like matter disappears when it burns, that is not what is really happening. It has long been proven that mass is not lost or gained when matter changes. The **law of conservation of matter** states that matter is not created or destroyed in any chemical or physical reaction.

The chemical change resulting from the combustion of natural gas, such as the gas from a stovetop burner, is a good example of the law of conservation of matter. Natural gas, primarily composed of methane, burns with oxygen and chemically changes into carbon dioxide and water. If you measured all the matter involved in this reaction before and after combustion, you would find equal amounts of carbon, oxygen, and hydrogen on both sides of the reaction.

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Chemical Change (pp. 70–72)

4. What is a chemical change?

5. How does a chemical change differ from a physical change?

6. Circle the letter of each example of a chemical change.

- a. distillation
- b. filtration
- c. oxidation
- d. electrolysis

7. The fact that matter is not created or destroyed in any change in matter is described by the _____.

8. Identify the following as a physical or chemical change.

- a. turning milk into chocolate milk _____
- b. tarnishing silver _____
- c. melting copper with tin to form a bronze _____
- d. burning a match _____