

Concept Review

Section: Changes of Matter

1. Categorize each of the following examples as a chemical or physical change.

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|------------------------------|--------------------------|
| _____ a. bending a metal rod | _____ d. painting wood |
| _____ b. burning wood | _____ e. cooking |
| _____ c. breaking glass | _____ f. burning propane |

2. Explain why dissolving is a physical change.

3. Explain why baking is a chemical change.

4. Compare physical changes and chemical changes.

5. List 4 ways to detect that a chemical change has occurred.

Answer Key

Bellringer Transparencies

SECTION: WHAT IS MATTER?

1. **a.** magnesium **b.** bromine **c.** nitrogen
d. bromine **e.** sulfur **f.** calcium
g. boron **h.** zinc **i.** neon
2. iron, silver, sulfur, zinc

SECTION: PROPERTIES OF MATTER

1. The first, because the molecules are packed together tightly, and can't move.
2. The third, because the molecules are widely separated and don't touch.
3. solid and liquid
4. The third, because the particles don't touch, and have difficulty interacting.

SECTION: CHANGES OF MATTER

1. Iron filings, as the other substances are non-magnetic.
2. Sand, since it can't go through the filter.
3. Water evaporates, leaving behind the sugar.

Concept Reviews

SECTION: WHAT IS MATTER?

1. **a.** heterogeneous **b.** homogeneous
c. heterogeneous **d.** heterogeneous
e. homogeneous **f.** homogeneous
2. An atom is the smallest particle that has the properties of an element, while a molecule is the smallest unit of a substance that has the properties of that substance. Molecules consist of one atom or two or more atoms chemically joined together.
3. A pure substance is made up of matter that has a fixed composition and definite properties. Although a homogeneous mixture is uniformly mixed, it is a combination of more than one pure substance and does not necessarily have a fixed composition.
4. **a.** compound **b.** element
c. compound **d.** element
e. compound **f.** element

5. Elements are pure substances because each has a fixed composition of protons, neutrons, and electrons and particular characteristic properties. Compounds are pure substances because each has a fixed composition of atoms and definite properties.
6. **a.** mixture **b.** pure substance
c. pure substance **d.** pure substance
e. mixture **f.** mixture

SECTION: PROPERTIES OF MATTER

1. **a.** physical **2. a.** physical
b. chemical **b.** chemical
c. physical **c.** physical
d. physical **d.** physical
e. chemical **e.** physical
3. Aluminum is light, durable, and inexpensive (physical properties), and non-reactive (chemical property).
4. 136.3 g silver
 $m = DV$
 $= (10.49 \text{ g/cm}^3)(12.99 \text{ cm}^3) = 136.3 \text{ g}$
5. 2.3 g/cm^3
 $D = m/V$
 $= (820 \text{ g})/(350 \text{ cm}^3) = 2.3 \text{ g/cm}^3$
6. Characteristic properties are properties a substance is known for. In this case, ice is known for its coldness and solidity, but not for its heat of fusion (energy required to melt a standard amount of ice).

SECTION: CHANGES OF MATTER

1. **a.** physical **b.** chemical **c.** physical
d. physical **e.** chemical **f.** chemical
2. The properties of the compound are unaffected.
3. New substances are formed by the application of heat.
4. Physical—properties unaffected, same substances
 Chemical—new properties, new substances
5. color or smell change, or sound or gas production