CHAPTER 1 REVIEW

CHAPTER SUMMARY

1-1

- Chemistry is the study of the composition, structure, and properties of matter and its changes.
- Chemistry is classified as physical science. Six areas of study in chemistry are organic chemistry, inorganic chemistry, physical chemistry, analytical chemistry, biochemistry, and theoretical chemistry.
- A chemical is any substance that has a definite composition or is used or produced in a chemical process.
- Basic research is carried out for the sake of increasing knowledge. Applied research is carried out to solve practical problems. Technological development involves the use of existing knowledge to make life easier or more convenient.

Vocabulary

chemical (6)
chemistry (5)

1-2

- All matter has mass and takes up space. Mass is one measure of the amount of matter.
- An element is composed of one kind of atom. Compounds are made from two or more elements in fixed proportions.
- All substances have characteristic properties that enable chemists to tell the substances apart and to separate them.
- The physical properties of a substance can be observed or measured without changing the identity of the substance. Physical changes do not involve changes in identity.
- The three major states of matter are solid, liquid, and gas. The particles in these states differ in proximity to one another and ease of flow. Changes of state, such as melting and boiling, are physical changes.
- Chemical properties refer to a substance's ability to undergo changes that alter its composition and identity. Chemical changes, or chemical reactions, involve changes in identity.
- Energy changes accompany physical and chemical changes. Energy may be released or absorbed, but it is neither created nor destroyed.
- Matter can be classified into mixtures and pure substances. Pure substances differ from mixtures in that they have a definite composition that does not vary. Solutions are homogeneous mixtures.

Vocabulary

atom (10)
change of state (12)
chemical change (13)
chemical property (12)
chemical reaction (13)
compound (11)
element (10)
extensive property (11)
gas (12)
heterogeneous (16)
homogeneous (16)
intensive property (11)
liquid (12)
mass (10)
matter (10)
mixture (15)
physical change (12)
physical property (11)
plasma (12)
product (13)
pure substance (17)
reactant (13)
solid (12)
solution (16)

1-3

- Each element has a unique symbol. The periodic table shows the elements organized by their chemical properties. Columns on the table represent groups or families of elements with similar chemical properties. Properties vary across the rows, or periods.
- The elements can be classified as metals, nonmetals, metalloids, and noble gases. These classes occupy different areas of the periodic table. Metals tend to be shiny, malleable, ductile, and good conductors. Nonmetals tend to be brittle and poor conductors. Metalloids are intermediate in properties between metals and nonmetals, and they tend to be semiconductors of electricity. The noble gases are generally unreactive elements.

Vocabulary

family (21)
group (21)
metal (22)
metalloid (24)
nonmetal (23)
period (21)