

SECTION 1-1

SECTION SUMMARY

Describing Matter

1

Guide for Reading

- ◆ What are the three states of matter?
- ◆ Why are characteristic properties useful?
- ◆ How can matter be classified?

Matter is the “stuff” that makes up everything in the universe. Some of matter’s properties include hardness, texture, flammability, and color.

Matter can change properties. For example, water is a liquid at room temperature, a solid at cold temperatures, and an invisible gas at high temperatures. **Solids, liquids, and gases are the three principal states of matter.**

A **characteristic property** is a property that always holds true for a substance. **Since, for a given substance, characteristic properties never change, they can be used to identify unknown matter.** Boiling point is a characteristic property. **Boiling point** is the temperature at which a liquid boils. Comparing boiling points can be used to identify one liquid from another. Melting point is a characteristic property that can be used to help identify solids. **Melting point** is the temperature at which a solid melts, or turns to liquid.

Matter can change in two ways. **Physical changes** alter the form of a substance, but not its identity. Ice melting is a physical change. **Chemical changes** occur when one or more substances combine or decompose to form new substances. Heating table sugar changes it into caramel. This is an example of a chemical change, because the original sugar particles no longer exist. The ability of a substance to undergo a chemical change is called the **chemical activity** of the substance. Chemical activity is another example of a characteristic property.

Matter can be classified into two general categories: mixtures and pure substances. The pure substances include elements and compounds.

A **mixture** consists of two or more substances that are mixed together but not chemically combined. In some mixtures the parts are so well blended they appear to be a single substance. This type of mixture is called a solution. A **solution** is the “best-mixed” of all possible mixtures.

Not every substance is a mixture. A **pure substance** is made of only one kind of material and has definite properties. **Elements** are pure substances that cannot be broken down into other substances by any chemical means. Elements can chemically combine in many different ways to form a huge variety of compounds. A **compound** is a pure substance formed from chemical combinations of two or more different elements. Compounds always have properties different from the elements that formed them. Water is an example of a compound.