

# 3.4 DENSITY

## Section Review

### Objectives.

- Calculate the density of a material from experimental data
- Describe how density varies with temperature

### Key Term

- density

### Key Equation

◦ Density =  $\frac{\text{mass}}{\text{volume}}$

### Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

- The ratio of the mass of an object to its volume is its 1.      1. density
- Density is an 2 property that depends only on the 3.      2. intensive
- of a substance, not on the size of the sample.      3. extensive

### Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- ST 4. The density of a substance decreases as its temperature is increased.
- ST 5. Density has units of grams per cubic centimeter.

### Part D Questions and Problems

Solve the following problems in the space provided. Show your work.

6. A rock has a mass of 127 g and displaces 32.1 mL of water. What is the density of the rock?

$$32.1 \text{ mL} \times \frac{1 \text{ cm}^3}{1 \text{ mL}} = 32.1 \text{ cm}^3$$

$$\text{Density} = \frac{\text{mass}}{\text{Volume}} = \frac{127 \text{ g}}{32.1 \text{ cm}^3} = 3.96 \text{ g/cm}^3$$

7. A 1.00-L sample of carbon tetrachloride has a mass of 1.58 kg. What is the density of this substance in g/cm<sup>3</sup>?

$$1.00 \text{ kg} \times \frac{1000 \text{ g}}{1 \text{ kg}} = 1580 \text{ g}$$

$$\text{Density} = \frac{\text{mass}}{\text{Volume}} = \frac{1580 \text{ g}}{1000 \text{ cm}^3} = 1.58 \text{ g/cm}^3$$