REVIEWING CONCEPTS

1. What is chemistry? (1-1)

2. What branch of chemistry is most concerned with the study of carbon compounds? (1-1)

3. What is meant by the word *chemical*, as used by scientists? (1-1)

4. Briefly describe the differences between basic research, applied research, and technological development. Provide an example of each. (1-1)

5. a. What is mass?
b. What is volume? (1-2)

6. How does the composition of a pure compound differ from that of a mixture? (1-2)

7. a. Define *property*.
b. How are properties useful in classifying materials? (1-2)

8. What is the difference between extensive properties and intensive properties? (1-2)

9. a. Define *physical property*.
b. List two examples of physical properties. (1-2)

10. a. Define *chemical property*.
b. List two examples of chemical properties. (1-2)

11. Distinguish between a *physical change* and a *chemical change*. (1-2)

12. a. How does a solid differ from a liquid?
b. How does a liquid differ from a gas?
c. How is a liquid similar to a gas?
d. What is a plasma? (1-2)

13. What is meant by a change in state? (1-2)

14. What is the significance of the vertical columns of the periodic table? What is the significance of the horizontal rows? (1-3)

15. Compare the physical properties of metals, nonmetals, metalloids, and noble gases and describe where in the periodic table each of these kinds of elements is located. (1-3)

16. In which of the six branches of chemistry would a scientist be working if he or she were doing the following: (1-1)
a. investigating energy relationships for various reactions
b. comparing properties of alcohols with those of sugars
c. studying reactions that occur during the digestion of food
d. carrying out tests to identify unknown substances

17. Identify the reactants and products in the following reaction: (1-2)

potassium + water $\longrightarrow$ potassium hydroxide + hydrogen

18. Suppose element X is a poor conductor of electricity and breaks when hit with a hammer. Element Z is a good conductor of electricity and heat. In what area of the periodic table does each element most likely belong? (1-3)

19. Identify each of the following as either a physical change or a chemical change. Explain your answers. (1-2)
a. A piece of wood is sawed in half.
b. Milk turns sour.
c. Melted butter solidifies in the refrigerator.

20. Use the periodic table to write the names of the elements that have the following symbols, and identify each as a metal, nonmetal, metalloid, or noble gas. (1-3)

a. K	c. Si	e. Hg
b. Ag	d. Na	f. He

21. An unknown element is shiny and is found to be a good conductor of electricity. What other properties would you predict for it? (1-3)

22. Identify each of the following as an example of either basic research, applied research, or technological development: (1-1)
a. A new type of refrigerant is developed that is less damaging to the environment.
b. A new element is synthesized in a particle accelerator.
c. A computer chip is redesigned to increase the speed of the computer.

23. Use the periodic table to identify the group numbers and period numbers of the following elements: (1-3)

a. carbon, C	c. chromium, Cr
b. argon, Ar	d. barium, Ba