why is the volume occupied by a gas about 1000 times that of the solid or liquid? *A3c*

16. Explain these properties of a gas in terms of the kinetic theory: *(a)* expansion; *(b)* pressure; *(c)* low density; *(d)* diffusion. *A3c, A3g*
17. Suppose the porous cup of Figure 10–5 is surrounded by carbon dioxide molecules. Carbon dioxide molecules are larger and heavier than the molecules of oxygen and nitrogen in the air. *(a)* Will air bubble from the glass tube? *(b)* Will water rise into the glass tube? *(c)* Explain. *A3i*
18. In terms of the kinetic theory explain what happens to a gas at its condensation temperature. *A3m, A3n*
19. Compare the strength of the attractive forces between the particles of nonpolar covalent molecular substances and polar covalent molecular substances as indicated by their condensation temperatures. *A3m, A3n, A3o*
20. Compare the strength of the attractive forces between the particles of molecular substances and the particles of ionic, covalent network, and metallic substances, as indicated by their condensation temperatures. *A3m, A3n, A3o*
21. At constant volume, how is the pressure exerted by a gas related to the Kelvin temperature? *A3p*
22. At constant pressure, how is the volume occupied by a gas related to the Kelvin temperature? *A3p*
23. At constant temperature, how is the volume occupied by a gas related to its pressure? *A3p*
24. A 50.0-mL sample of hydrogen is collected over mercury in one eudiometer, and a second 50.0-mL sample of hydrogen is collected over water in another eudiometer. The liquid levels inside and outside each eudiometer are the same. *(a)* How do the hydrogen pressures compare? *(b)* Why? *B5, B6*
25. How is the barometer reading corrected to give the pressure of the dry gas when *(a)* the gas is collected by displacement of mercury, level inside the eudiometer the same as that outside; *(b)* the gas is collected by displacement of mercury, level inside the eudiometer higher than that outside; *(c)* the gas is collected by displacement of water, level inside the eudiometer the same as that outside; *(d)* the gas is collected by displacement of water, level inside the eudiometer higher than that outside? *A2, B5, B6*
26. Boyle's and Charles' laws describe the behavior of the ideal gas. Under what conditions do they describe the behavior of real gases? *A3r*

PROBLEMS

Group A

Use cancellation if possible.

1. Some oxygen occupies 150 mL when its pressure is 720 mm. How many milliliters will it occupy when its pressure is 750 mm? *B1*
2. A nitrogen sample collected when the pressure is 800 mm has a volume of 190 mL. What volume, in milliliters, will the nitrogen occupy at standard pressure? *B1*
3. Some hydrogen has a volume of 300 mL when the pressure is 740 mm. How many milliliters will the hydrogen occupy at 700 mm pressure? *B1*
4. A sample of helium has a volume of 200.0 mL at 73.0 cm pressure. What pressure, in centimeters of mercury, is needed to reduce the volume to 50.0 mL? *B1*
5. Convert the following temperatures to Kelvin scale: *(a)* 25 °C; *(b)* 70 °C; *(c)* −18 °C; *(d)* −253 °C. *B2*
6. Given 100 mL of hydrogen gas collected when the temperature is 27 °C, how many milliliters will the hydrogen occupy at 42 °C? *B3*
7. A sample of argon has a volume of 155 mL when its temperature is 37 °C. At what Celsius temperature will the volume of the ar-