

14

THE BEHAVIOR OF GASES

Vocabulary Review

Match the correct vocabulary term to each numbered statement. Write the letter of the correct term on the line.

Column A

- \_\_\_\_\_ 1. At constant volume and temperature, the total pressure exerted by a mixture of gases is equal to the sum of the partial pressures of the component gases.
- \_\_\_\_\_ 2. The volume of a fixed mass of gas is directly proportional to its Kelvin temperature if the pressure is kept constant.
- \_\_\_\_\_ 3. The rate of effusion of a gas is inversely proportional to the square root of its molar mass.
- \_\_\_\_\_ 4. the contribution each gas in a mixture makes to the total pressure of that mixture
- \_\_\_\_\_ 5. a measure of how much the volume of matter decreases under pressure
- \_\_\_\_\_ 6. For a given mass of gas at constant temperature, the volume of the gas varies inversely with pressure.
- \_\_\_\_\_ 7. the tendency of molecules to move toward areas of lower concentration until the concentration is uniform throughout
- \_\_\_\_\_ 8.  $\frac{P_1 \times V_1}{T_1} = \frac{P_2 \times V_2}{T_2}$
- \_\_\_\_\_ 9. the escape of a gas through a tiny hole in a container of gas
- \_\_\_\_\_ 10. 8.31 (L·kPa)/(K·mol)

Column B

- a. combined gas law
- b. ideal gas constant (R)
- c. diffusion
- d. compressibility
- e. Boyle's law
- f. partial pressure
- g. Dalton's law of partial pressures
- h. effusion
- i. Charles's law
- j. Graham's law of effusion

14

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Chapter Quiz

Fill in the word(s) that will make each statement true.

1. Adding more gas to a closed container increases the number of 1 of particles with the walls of the container. 14.1
2. Doubling the number of particles of a gas in a container 2 the pressure, assuming that the temperature is constant. 14.1
3. According to kinetic theory, the particles of a gas have a volume that is 3 compared to the total volume of the gas. 14.1
4. One difference between real gases and ideal gases is that 4 gases may be liquefied when they are cooled and pressure is applied to them. 14.3
5. The tendency of a gas to move toward areas of lower concentrations until the concentration is uniform throughout is 5. 14.4

Solve the following problems in the space provided.

6. A rigid container of O<sub>2</sub> has a pressure of 388 kPa at a temperature of 713 K. What is the pressure at 273 K? 14.2
7. A flexible gas storage container has a volume of 3.5 × 10<sup>5</sup> m<sup>3</sup> when the temperature is 27°C and the pressure is 115 kPa. What is the new volume of the container if the temperature drops to -10°C and the pressure drops to 99 kPa? 14.2
8. A mixture of gases at a total pressure of 145.0 kPa contains N<sub>2</sub>, CO<sub>2</sub>, and O<sub>2</sub>. The partial pressure of the N<sub>2</sub> is 28.5 kPa, and the partial pressure of the CO<sub>2</sub> is 76.0 kPa. What is the partial pressure of the O<sub>2</sub>? 14.4