

Name: _____ Per _____

Mixed Gas Laws and Applications

Practice Sheet #31

Directions: Give the name of the gas law required to solve each problem. Solve the equation and give the answer with appropriate units.

1. The initial pressure of a gas is 2.0 atm and the initial volume is 150 mL. Determine the final pressure if the final volume is 200 mL.
2. The initial temperature of a gas is 27 °C and the initial pressure is 4.00×10^5 Pa. Determine the final temperature if the final pressure is 6.50×10^5 Pa.
3. Calculate the volume of 3.4 mol of a gas at STP.
4. The initial temperature of a gas is 800 K and the initial volume is 3.00 L. Determine the final volume if the final temperature is 600 K.
5. Calculate the volume of 0.750 mol of a gas at 4.00 atm of pressure at 250 K.
6. A sample of gas has an initial pressure of 2.0×10^6 Pa and an initial volume of 4.0 L at an initial temperature of 55 °C. Calculate the final pressure if the final volume is 2.0 L and the final temperature is 65 °C.
7. Calculate the total pressure of a mixture of neon, argon, and xenon if the neon has a partial pressure of 0.50 atm, the argon has a partial pressure of 0.75 atm, and the xenon has a partial pressure of 0.25 atm.
8. Determine the volume of 2.00×10^{24} atoms of krypton gas at STP.
9. Determine the pressure (in Pa) if 200 g of water vapor occupies 200 mL at 43 °C.
10. Determine the temperature if 6.80×10^{22} molecules of sulfur dioxide gas occupies 0.500 L at 2.00 atm.

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11. A sample of monatomic gas has a mass of 0.920 g and occupies a volume of 200 mL at 1.32 atm and 20 . Determine the molar mass of the gas. Identify the gas.

12. A sample of a diatomic gas has a density of 1.30 g/L at 45.4 kPa and 298 K. Determine the molar mass of the gas. Identify the gas.

13. A sample of gas (containing only nitrogen and fluorine) has a mass of 0.822 g and a volume of 0.400 L at 722 mm Hg and 400 K. Calculate the molar mass of the gas. Determine the formula for the gas.

14. A sample of gas (containing only sulfur and oxygen) has a density of 1.28 g/L and 0.400 atm and 32 °C. Calculate the molar mass of the gas. Determine the formula for the gas.

15. Answer the following questions
 - a. A 0.400 g sample of a gas has a volume of 0.125 L at 0.800 atm and 280 K. Calculate the molar mass of the gas.

 - b. The 0.400 g sample is analyzed and is found to have 0.122 g of nitrogen and 0.278 g of oxygen. Determine the empirical formula of the gas.

 - c. From the molar mass (ie the molecular weight) and the empirical formula, determine the molecular formula.

 - d. Give the name and the molecular formula of the gas.