

**Worksheet: Dalton's Law, Avogadro's Hypothesis, Molar Volume**

Name \_\_\_\_\_

1. A) John \_\_\_\_\_ was the first to form a hypothesis about partial \_\_\_\_\_ of combined gases. After experimenting with gases, he concluded that each gas exerts the same pressure it would if it \_\_\_\_\_ were present at the same temperature. If a gas is collected over water, the pressure in the container actually includes the sum of the vapor \_\_\_\_\_ of the gas and the \_\_\_\_\_ vapor pressure. Consequently, we must \_\_\_\_\_ the water vapor pressure from the total pressure to obtain the pressure of the \_\_\_\_\_ alone.

B) A quantity of gas is collected over water at 20.°C. The manometer indicated a pressure of 34.6 kPa. What would be the pressure of the dry gas?

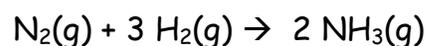
C) Determine the total pressure of a gas mixture that contains oxygen, nitrogen and helium if the partial pressures of the gases are: oxygen = 150 mm Hg, nitrogen = 350 mm Hg, and helium = 210 mm Hg.

2. A) Avogadro's law states that equal volumes of different gases, at the same \_\_\_\_\_ and \_\_\_\_\_, contain the same \_\_\_\_\_ of \_\_\_\_\_.

B) According to Avogadro's law, how will the number of molecules in 2 liters of hydrogen gas compare with the number of molecules in 2 liters of oxygen gas at the same temperature and pressure? \_\_\_\_\_

C) Why is 22.4 liters called the molar volume of a gas?

D) In the following equation, what volume of hydrogen will produce 0.25 mole of  $\text{NH}_3$  at standard conditions of temperature and pressure?



E) When magnesium burns in the presence of oxygen, magnesium oxide is formed. How many moles of magnesium were burned if at STP, the magnesium was ignited in a 0.50 L container of oxygen gas?