**CONCEPT:** PARTIAL PRESSURE

- **Partial Pressure ($P_{Gas}$)** is the pressure exerted by an individual gas within a mixture.
  - □ In a container of unreacting gases, *total pressure* of the container is the sum of the *partial pressures* of each gas.

**Law of Partial Pressures**

$$P_{Total} = P_{Gas\_\_} + P_{Gas\_\_} + P_{Gas\_\_} + .....$$

**EXAMPLE:** A sample of neon gas exerts a pressure of 1.85 atm inside a cylinder. Some nitrogen gas is also present, at a pressure of 500 torr. What is the total pressure inside the cylinder?

**Using moles to determine Partial Pressure**

- If you assume that the gases behave ideally, then their partial pressures can be calculated from the Ideal Gas Law.

**Partial Pressure (Ideal Gas Law)**

$$P_{Gas\_\_} = \frac{n\_\_RT}{V}$$

**EXAMPLE:** If 12.0 g helium and 20.0 g oxygen are placed inside a 5.0 L cylinder at 30 ºC, what is the partial pressure of the helium gas?

**CONCEPT:** PARTIAL PRESSURE

**Dalton's Law**

- Uses *Mole Fraction (X)* of a gas to calculate its partial pressure.

**Dalton's Law**

$$P_{Gas\_\_\_} = X_{Gas\_\_\_} \bullet P_{Total}$$

**EXAMPLE:** A container has 16.7 g $O_2$, 8.1 g $H_2$ and 35.2 g $N_2$ and contains a total pressure of 0.83 atm. Calculate the mole fraction of $O_2$ and its partial pressure.

**PRACTICE:** A sample of 3.51 g argon and an unknown amount of oxygen are mixed in a container at room temperature. The partial pressure of argon was calculated as 71.0 torr and the partial pressure of oxygen as 188 torr. What is the mass of the oxygen within the container?

**PRACTICE:** A gas mixture contains 72.8% chlorine and 27.2% neon by mass. What is the partial pressure of neon in the mixture if the total pressure is recorded as 809 mmHg?