

CT Chem Unit 10 Gases

Dalton's Law of Partial Pressures Notes

Dalton's Law: When gases are mixed each gas has its own pressure, but share a volume.

Review:

- Ideal gas Law $PV=nRT$ ($R= .0821 \text{ L*atm/mol*K}$)

Notes:

- This gas law is very simple. Just add the partial pressures to get the total pressure.
- Page 420 through 425 in the book.
- Mathematically: $P_{\text{Total}} = P_1 + P_2 + P_3 \dots$ where the pressures are for each individual gas.
- Can be combined with the Ideal Gas Law: $P_{\text{Total}} = n_{\text{Total}}(RT/V)$

Cautions:

1. Always use Kelvin (K) and moles not Celsius ($^{\circ}\text{C}$) and grams!
2. The volume is the SAME for both gasses!

Examples:

1. What is the total pressure when 5.0 L of Hydrogen (H_2) at 1.00 atm is pumped into a 5.0 L container along with 5.0 L of Oxygen (O_2) at 1.00 atm?
2. What is the total pressure, in Kpa, when 720mmHg of Hydrogen (H_2) is mixed with 350 torr of Oxygen (O_2) and .753 atm of Helium (He)?

3. Assume that oxygen gas is being collected over water at 25°C . Write an equation for the pressure of oxygen gas (assume the pressure in the bottle is STP)
4. If 4.0 g of $\text{O}_2(\text{g})$ and 4.0 g of $\text{He}(\text{g})$ are placed in a 5.0 L vessel at 65°C , what will be the partial pressure of each gas and the total pressure in the vessel (Hint: calculate the number of moles using molar mass)?