Directions: The lecture includes these practice problems. Use information from the lecture to complete these problems together in class.

Section 10.5 Further Application of Ideal Gas Equation

Question: How can we work mass into the Ideal gas Equation?

What is the density of carbon tetrachloride vapor at 714 torr and 125°C?

The safety air bags in automobiles are inflated by nitrogen gas generated by the rapid decomposition of sodium azide, NaN_3:

$$2NaN_3(s) \rightarrow 2Na(s) + 3N_2(g)$$

If the air bag has a volume of 36 L and is to be filled with Nitrogen gas at a pressure of 1.15 atm at a temperature of 26°C, how many grams of NaN_3 must be decomposed?

Section 10.6 Gas Mixtures and Partial Pressures

A gaseous mixture made from 6.00 g O_2 and 9.00 g CH_4 is placed in a 15.0 L vessel at 0° C. What is the partial pressure of each gas?

b) What is the total pressure inside the vessel?

A study of the effects of certain gases on plant growth requires a synthetic atmosphere composed of 1.5 mol percent CO_2, 18.0 mol percent O2, and 80.5 mol percent Ar.

(a) Calculate the partial pressure of O_2 in the mixture if the total pressure of the atmosphere is to be 745 torr.

(b) If this atmosphere is to be held in a 120 L space at 295 K, how many moles of O_2 are needed?

10.7 Kinetic Molecular Theory

Write the postulates of the KMT below:

1. _____
2. _____
3. _____
4. _____
5. _____

A sample of O_2 Gas initially at STP is compressed to a smaller volume at constant temperature. What effect does this have on:

a) The average kinetic energy of O_2 molecules?

b) The average speed of O_2 molecules?

c) The total number of collisions of O_2 molecules with the walls of the container per unit time?

10.8 Molecular Effusion and Diffusion

Calculate the rms speed, *u*, of an N_2 molecule at 25°C. Where R = 8.314 J/mol-K.

Calculate the ration of the effusion rates of N_2 and O_2

10.9 Real Gas Derivations

Write the Van der Waals Equation below:

What pressure is exerted by 2.00 moles of oxygen gas in a volume of 5.00 L at a temperature of 50° °C?