**GASES Review**

List the characteristics of gases.

Under what conditions do gases not behave ideally?

Which of these gases would probably exhibit the most ideal behavior? N2, He, H2O Which would be least ideal?

Explain your reasoning. Larger molecules have more attractive forces(LDFs) and what is special about water?

Explain the 2 corrections of the van der Waals equation.

What is KMT? How does the KMT explain Charles’ Law and Boyle’s law?

Why MUST temperatures be converted from oC to K when completing gas law calculations?

Ex: What happens to the volume of a gas if the temperature goes from 20oC to 40oC? ***versus***

What happens to the volume of a gas if the temperature goes from 200K to 400K?

What ***elemental gas*** would have the highest rate of effusion? \_\_\_ the lowest? \_\_\_\_ Explain your choices.

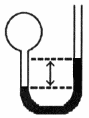
(don’t forget some elements are diatomic)

Compare the KEs of these 2 gases at the same temperature. Explain.

A sample of unknown gas effuses at a rate that is ¼ the rate of Ne gas. What is the molar mass of this gas?

(Use Graham’s Law)

6 moles of N2 are mixed with 8 moles of Xe at a total pressure of 3atm. What is the partial pressure of each gas?



A gas vessel is attached to an open-end manometer filled with mercury as shown. The difference in heights of the liquid in the two sides of the manometer is 32.3***cm*** when the atmospheric pressure is 765 mmHg. What is the pressure of the gas in the manometer?

How does a decreased temperature affect the pressure of a gas in a rigid container? How does KE change?

Three different gases are in 3 separate 1L containers at the same temperature and pressure. What can be said about the moles of gas in each? Which one would have the lowest mass?

A sample of carbon dioxide gas in a rigid 1L container at 20oC. Will EVERY molecule in the container have the EXACT same speed? Why/why not?

One container has 500 molecules of gas inside while another has 250 molecules inside. Both containers have the same volume and temperature. Which one has the lower pressure? Why?

A gas is collected over water during an experiment at 25oC. How would you determine the partial pressure of the “dry” gas in the container?

FRQs : Ideal Gas Law, Stoichiometry, Percent Error, Percent Yield, Redox, Daltons Law

\*All FRQs require you to analyze data

A rigid 5.00 L cylinder contains 24.5 g of N2(*g*) and 28.0 g of O2(*g*). 2003 FRQ2

a) Calculate the total pressure, in atm, of the gas mixture in the cylinder at 298 K. *(2-4pts)*

b) The temperature of the gas mixture in the cylinder is decreased to 280 K. Calculate each of the following.

i) The mole fraction of N2(*g*) in the cylinder *(1pt)*

ii) The partial pressure, in atm, of N2(*g*) in the cylinder *(1-2pts)*

moles of N2(*g*)

c) If the cylinder develops a pinhole-sized leak and some of the gaseous mixture escapes, would the ratio moles of O2 (*g*) in the cylinder increase, decrease, or remain the same? Justify your answer. *(1pt)*

A different rigid 5.00 L cylinder contains 0.176 mol of NO(*g*) at 298 K. A 0.176 mol sample of O2(*g*) is added to the cylinder, where a reaction occurs to produce NO2(*g*).

d) Write the balanced equation for the reaction. *(1-2pts)*

e) Calculate the total pressure, in atm, in the cylinder at 298 K after the reaction is complete. *(2-4pts)*