Honors Chemistry
Module 9 – Guided Notes

Name _____

Properties of Gases

Gas molecules are _____.

Since they are so _____, we can _____ the molecules together, _____ the gas.

A gas is the only main state of matter that can _____.

All Gases Have Four Properties

_____ – determined by how often the gas molecules _____.

_____ – the amount of _____ the gas takes up

_____ – a measure of the _____ of the molecules

_____ of gas molecules – usually measured in _____

Boyle's Law

the _____ of a gas is _____ proportional to its _____.

A balloon is filled with 30. L of helium gas at 1 atm. What is the volume when the balloon rises to an altitude where the pressure is only _____ atm?

Charles' Law

the _____ of a gas is _____ proportional to its _____.

= K

A balloon in an air-conditioned room at 27°C, is inflated to a volume of 4.0 L. It is then heated to a temperature of _____°C. What is the new volume of the balloon if the pressure remains constant?

Gay-Lussac's Law

the _____ of a gas is _____ proportional to its _____.

A tire has a pressure of 20.0 p.s.i. when the temperature is –17.°C. What will be the tire pressure when the temperature goes up to _____.°C?

A sealed zippered plastic bag has 1.00 liter of air sealed inside at a room temperature of _____°C. When the bag is placed into a freezer at a temperature of –18°C, what will its volume be?

Combined Gas Law – the first three gas laws, all combined

A container with an initial volume of 1.0 L is occupied by a gas at a pressure of 1.5 atm at 25°C. By changing the volume, the pressure of the gas increases to _____atm as the temperature is raised to 100.°C. What is the new volume?

Ideal Gas Law

$$\mathbf{P\,V = \mathit{n}\,R\,T}$$

P = _____ in _____ R = _____

V = _____ in _____ T = _____ in _____

n = number of _____ of gas

A rigid steel container with a volume of 20.0 L is filled with nitrogen gas to a final pressure of _____ atm at 27.0°C. How many moles of N_2 gas does the cylinder contain?

What volume will 12.0 g of oxygen gas (O_2) occupy at 25°C and a pressure of _____atm?

Graham's Law of Effusion

The _____ of gas particles is _____ to their _____.

Effusion is the _____ of molecules through a _____ in a material.

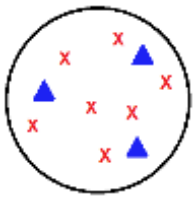
Graham's Law tells us that more _____ molecules move more _____ than _____ molecules.

Which gas effuses faster: nitrogen or helium? How much faster?

Calculate the ratio of the velocity of helium atoms to neon atoms at the same temperature.

A total of 0.150 moles of a gas has a volume of _____L. If the temperature inside the gas container is 77°C, calculate the pressure of the gas, in atmospheres.

Partial Pressure of a Gas



What percentage of the pressure is due to the red X molecules? _____

What percentage of the pressure is due to the blue triangle molecules? _____

Dalton's Law of Partial Pressures

$$Partial\ Pressure_{Gas} = X_{Gas} \cdot P_{total}$$

Partial Pressure = the pressure that a specific gas is _____

X_{gas} = the _____ the gas is _____ in the mixture

P_{total} = the total _____ in the container

A flask has a total pressure of 1.25 atm. If the flask contains 7.2 moles of water vapor and _____moles of carbon dioxide gas, then what is the partial pressure of (a) water vapor? (b) carbon dioxide?

A gas chamber has a total pressure of 1.80 atm. If _____grams of oxygen gas (O_2) and _____grams of nitrous oxide (N_2O) are present in the chamber, what will be the partial pressure of (a) oxygen? (b) nitrous oxide?