CONCEPT: THE IDEAL GAS LAW

- **The Ideal Gas Law** formula relates the behavior of gases under varying conditions of ____, ____, ____, & ____.

Ideal Gas Law

Ideal Gas Law Formula

$$PV = nRT$$

- ☐ P = Pressure of the gas in _____.
- ☐ V = Volume of the gas in _____.
- ☐ n = Amount of the gas in _____.
- ☐ R = Gas constant of all gases in _____.
- ☐ T = Temperature of the gas in _____.

EXAMPLE: A 500 mL container at a pressure of 600 mmHg possesses 29.3 g nitrogen gas at 50 ºC. Determine the correct units needed for the Ideal Gas Law.

R Constant

- The gas constant R can have two different values depending on the situation.
  - ☐ R = 0.08206 when using **atm** in the Ideal Gas Law Formula.
  - ☐ R = 8.314 when we deal with _____, _____, or _____.
  - ☐ The **conversion factor** between both R values is 1 L•**atm** = _____ **J**.

Gas Constant

When using **atm**	**Conversion Factor**	When using **J**
$\frac{L \cdot atm}{mol \cdot K}$	$=$	$\frac{J}{mol \cdot K}$

EXAMPLE: How many moles of NH_3 are contained in a 25.0 L tank at 190 ºC and 5.20 atm?

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PRACTICE: How many grams of carbon dioxide, CO_2, are present in a 0.150 L flask recorded at 525 mmHg and 32 ºC?

PRACTICE: How many liters of HNO_3 gas, measured at 28.0 ºC and 780 torr, are required to prepare 2.30 L of 4.15 M solution of nitric acid?

PRACTICE: When 0.670 g argon is added to a 500 cm^3 container with a sample of oxygen gas, the total pressure of the gases is found to be 1.52 atm at a temperature of 340 K. What is the mass of the oxygen gas in the bulb?