

Chemistry 1104 Lab: Molar Mass

Goals:

- 1. Introduction to Gas Laws.**
- 2. Determine the Molar Mass(g/mole) of an unknown substance.**

Ideal Gas Law:

$$**PV = nRT**$$

P = Pressure

V = Volume

n = moles of gas

R = Gas Constant(0.0821 L·atm/K·mole)

T = Temperature in Kelvin

Modified Ideal Gas Law:

$$M = \frac{mRT}{PV}$$

P = Pressure

V = Volume

m = mass of gas

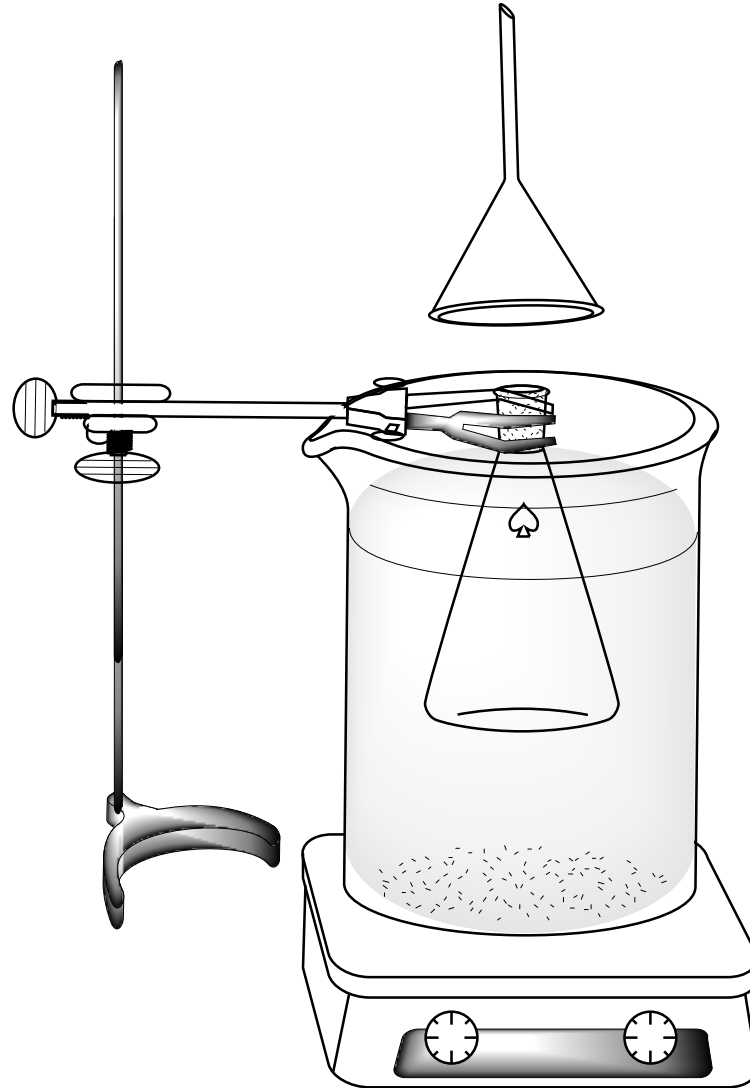
R = Gas Constant(0.0821 L·atm/K·mole)

T = Temperature in Kelvin

$$T(\text{K}) = T(^{\circ}\text{C}) + 273.15$$

Experimental Setup:

To vacuum



Experimental Procedure:

- 1. Record Mass of flask and stopper.**
- 2. Add unknown to flask. Cover.**
- 3. Heat flask and unknown until liquid vaporizes and fills flask.**
- 4. Remove flask. Stopper. Cool. Vent.**
- 5. Record mass of flask, stopper and condensed liquid.**
- 6. Discard unknown.**
- 7. Fill flask with water and determine mass of water. $\text{Mass of Water(g)} = \text{Volume(mL)}$**