

Notes for Completing the Lab Write-Up for "Molar Volume of a Gas"

(1) You need to find the mass of your strip of Mg ribbon. You never put it on a balance, but you *did* find its length. You wrote down the length in cm. You need to convert this to m, and then convert this to grams using the conversion factor "1.27 g = 1.000 m of Mg ribbon". (Recall that I weighed out 1 whole meter of Mg ribbon before the lab, and recorded its mass on the board.)

*** cm → m → g

(2) Convert g (from #1) to mol using the periodic table.

(3) Correct the P of the gas in the eudiometer to account for the fact that the gas you collected contained water vapor.

a. The P in your eudiometer is equal to the P outside of the eudiometer (i.e., the atmospheric pressure) because you equalized the water levels (in the eudiometer and water column) before recording the gas volume.

b. The P of the atmosphere ("barometer reading" in your data table on p.93) was 30.04 **INCHES** of Hg, but must be converted to **mm of Hg** in order for you to finish this lab report.

c. Dalton's Law: $P_{\text{tot}} = P_{\text{H}_2} + P_{\text{H}_2\text{O (g)}}$.

d. You looked up $P_{\text{H}_2\text{O (g)}}$ in the fat green book in class – "vapor pressure of water at observed temperature" in your data table.

(4) Do not do #4 or #5 as written in the lab handout. Instead, solve the combined gas law one time. This will answer both questions at once. You are doing this step to correct your volume to standard conditions ("STP").

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

P_1 = your corrected pressure from #3

V_1 = the volume of H_2 gas that you recorded in the Data Table (p.93)

T_1 = the temperature that you recorded the Data Table (p.93), but it has to be converted to K first

P_2 = standard pressure (must be in mm Hg)

V_2 = what you are looking for here

T_2 = standard temperature (must be in K)

(5) Question six: Solve a proportion. You used only a tiny fraction of a mole of Mg, so you only produced a tiny fraction of one mole of H_2 . Therefore, find out how much your volume *would have been* if you *had* used a whole mole of Mg:

$$\frac{(\text{answer to \#2}) \text{ moles}}{(\text{answer to \#4\&5}) \text{ ml}} = \frac{1.00 \text{ moles}}{X \text{ ml}}$$