Molar Volume Lab

Purpose: To experimentally determine the molar volume of a gas and the value of R.

Materials: Thermometer, eudiometer tube, 3 M HCl, Mg ribbon, stopper, Cu wire

Procedure:

1. Cut the assigned length of Mg ribbon.
2. Place 10 ml of HCl in the bottom of the eudiometer tube.
3. Fill the tube with water
4. Tie the Mg ribbon in a string and use your finger to hold it in place.
5. Without spilling water, tip the tube into a large beaker or graduated cylinder.
6. Record the volume of gas created. **When reading the volume, how should the water level inside the tube compare to the water level outside the tube?**

Calculations:

Use information given in class and other data as necessary to determine the volume of one mole of a gas. After determining the volume of one mole, use your value to calculate a value for R. Determine the percent error for your molar volume determination.

Additional questions and calculations:

1) Explain how Dalton's law of partial pressures relates to the collection of a gas over water.

2) Write the balanced equation and net ionic equation for the reaction which took place in the lab today.

3) Assuming you used exactly 10.0 mL of 6.00 M HCl, determine how many mL of HCl remain unused after all the magnesium has reacted.

4) Using your original mass of magnesium, calculate the number of mL of hydrogen gas which should have formed at classroom conditions. You will need to use your knowledge of stoichiometry and the ***ideal gas law*** in order to make this calculation.

5) Now, using your original mass of magnesium, calculate the number of mL of hydrogen gas which should have formed at classroom conditions. This time you will need to use your knowledge of stoichiometry and the ***combined gas law*** in order to make this calculation.

NOTE: Your answers to questions 4 and 5 should be identical.

In two typewritten paragraphs, explain the math used to determine the molar volume and the R value.