Names:

Data Table		
Mass of 100 cm of Mg		g
Room temperature (rt)		°C
Vapor pressure of H_20 @ rt		mm Hg
Room pressure		mm Hg
"wet" gas volume		mL

Procedure:

1. Cut and measure approximately 4.00 cm of Mg ribbon. Measure the length of this segment as accurately as possible.

2. Crumple the ribbon into a ball small enough to fit into the eudiometer. Make sure as much surface area as possible will be exposed to the HCl.

3. Tie some thread or copper wire to the ball of Mg, and thread through the hole in the rubber stopper.

4. Pour approximately 10 mL of 6.0 M HCl (or approx 20 mL of 3 .0 M) into bottom of eudiometer. If you spill any acid on your hands, quickly, but safely, place eudiometer in clamp, and wash your hands.

5. Layer distilled water, using squeeze bottle, on top of the HCl, until the water is almost overflowing the tube.

6. Place rubber stopper/Mg assembly in end of tube, making sure no air bubbles get into tube.

7. Keeping your finger over the hole of the plug

8. Turn the tube upside down, and quickly, and carefully, place the stoppered end in a ¾ full 1000 mL beaker of water.

9. Secure the tube in a eudiometer clamp on the ring stand.

10. When the Mg is totally reacted, lower the tube into the water so that the level of the water in the tube is at the same level of the water in the beaker.

11. Read the volume of gas from the eudiometer to the maximum precision possible.

Determine the:

1) mass of magnesium used. (length of sample x (mass of 100cm of Mg ribbon)/100)

2) moles of magnesium used. (atomic mass of Mg = 24.3 g/mol)

3) moles of hydrogen gas produced. (what is molar ratio of Mg:H_2?)

4) pressure of the "dry" hydrogen gas. (pressure of “wet” gas – vapor pressure)

5) volume of "dry" hydrogen gas at STP. (rt = Room Temperature)

a. adjust for 273K, use Charles’ Law $V_{273\,K} = V_{rt\,K}$ (273 K/ rt K)

b. adjust for 760 mm Hg, use Boyle’s Law $V_{760mm} = V_{dry}$ (P_{dry}/760 mm)

6) value (in liters/mole at STP) for molar volume. Use the data from your experiment. (convert mL to L)

7) percent error. The true value for molar volume at STP is 22.4 L/mol.
% error = (l 22.4 – experimental value l)/22.4 x 100

8) Please discuss what *experimental* errors (not misreading the equipment) may have affected the outcome of your calculations. Please describe *how* the calculations would be affected.