Name: _____   Section: _____

Data and Calculations

Unknown Number _____

Atmospheric pressure _____ torr = _____ atm

	Trial 1		Trial 2
1. Mass of dry flask with stopper	_____	=	_____
2. Mass of flask, stopper, & <u>condensed</u> liquid	_____		_____
3. Mass of <u>condensed</u> liquid	_____		_____
4. Temperature of boiling water	_____		_____
5. Volume of flask (see flask)	_____	=	_____
6. Molecular weight of sample)	_____		_____

(These values must be within 5 % of each other. If not, a third trial must be run.)

7. Average Molecular Weight[*]   _____
    [*]*Average only those values within the limit*

SHOW CALCULATIONS:

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Questions (to be completed while in the laboratory)

1. Obtain the mass percent composition information of your unknown from your instructor. Solve for the empirical formula, and then using your determined molecular weight, solve for the molecular formula of your compound.

Empirical Formula _____

Molecular Formula _____

2. Determine your percent error using your experimental molecular weight and the theoretical molecular weight determined via your molecular formula.

3. Write the ideal gas law equation for molecular weight.

Post-lab Questions

4. It was found that 0.801 gram of vapor exerted a pressure of 744 torr at 100 °C when confined to a 260 mL flask. If this vapor came from a volatile liquid, what is the molecular weight of the liquid?

5. Based on this experiment:

    A. How do you experimentally determine the temperature of the unknown when it is a gas?

    B. How do you experimentally determine the pressure of the unknown when it is a gas?

6. What is the purpose of cooling the flask?

7. Why will air rush into the cooled flask when the stopper is removed?

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8. How would each of the following procedural errors affect the calculated molecular weight in this experiment? Give your reasoning in each case.

    A. All of the liquid was not vaporized when the flask was removed from the water bath.

    B. The flask was not dried before the final weighing with the condensed vapor inside.

    C. The flask was left open to the atmosphere while it was being cooled, and the stopper was inserted just before the final weighing.

    D. The flask was removed from the bath after all of the liquid had vaporized but before the vapor had reached the temperature of the boiling water.