# CHM 111 - Molar Mass and Chemical Formula of a Volatile Liquid

Unknown number \_\_\_\_\_\_\_\_2024\_\_\_\_\_\_\_\_\_\_\_

For all report forms, include a neat example of each calculation on a ***separate*** sheet of paper. Include units and apply significant figure rules correctly.

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| Trial 1 |  | Trial 2 |
| Mass of vapor (g) \_\_\_\_0.6567g\_\_\_\_ |  | \_\_\_\_0.4989g\_\_\_\_ |
| Volume of flask (L) \_\_\_\_0.163L\_\_\_\_\_\_ |  | \_\_\_\_0.158L\_\_\_\_\_ |
| Temp. of boiling water (oC) \_\_\_\_100C\_\_\_\_\_\_\_\_ |  | \_\_\_\_100C\_\_\_\_\_\_ |
| Barometric Pressure (atm) \_\_\_0.9936 atm\_\_\_\_ |  | \_\_\_0.9936atm\_\_\_ |
| Molar Mass \_\_\_124. g/mol\_\_\_  Average Molar Mass (1) \_\_\_111. g/mol\_\_\_ |  | \_\_\_97.3 g/mol\_\_ |

Elemental Analysis (list data copied down in lab):

C = 37.5%, H = 12.5%, O = 50.0%

Empirical Formula: CH4O

Molecular Formula: C7H28O7

Molar mass based on molecular formula (2) \_\_\_\_\_\_\_\_224.294 g/mol\_\_\_\_\_\_\_\_\_\_\_\_\_

**Reflection:** Write a brief statement (2-3 sentences) on the quality and reasonableness of the data you collected. Note what you might do differently if you performed the lab again. How does what you did in lab this week relate to what we are learning in lecture (1-2 sentences)?

The quality is bad. One molar mass indicates an integral factor of 3, the other indicates a 4, the mean of them indicates a 3.5, which then translates to a 7. If I had a third trial to make the data clearer the quality would certainly be improved. The quality was also significantly dropped due to the absence of my lab partner, the incompatibility of the new partner I worked with, and unknown factors that made our unknown substance boil prior to water boiling by a large margin (~10-20C before 100C). If I were to perform the lab again, I would most importantly work alone, and perform a 3rd, maybe even a 4th trial to solidify my data, and certainly swap out whatever impure substance that was sitting on our table ruining our data. The lab related to our lectures where we used the PV = nRT formula to determine moles of a gaseous substance