

LABORATORY 10.1

Introduction

The purpose of this laboratory is to determine the molar mass of a volatile liquid. The experiment involves measuring the mass of a known volume of the liquid in a flask, and then using the ideal gas law to calculate the molar mass.

The procedure involves the following steps:

1. Weigh a clean, dry flask with a stopper.
2. Heat the flask in a boiling water bath until the liquid has completely vaporized and the flask is filled with the vapor.
3. Cool the flask and stopper, and weigh the flask with the condensed liquid.
4. Measure the volume of the flask.
5. Record the temperature of the boiling water bath and the atmospheric pressure.

The molar mass can be calculated using the ideal gas law, $PV = nRT$, where P is the atmospheric pressure, V is the volume of the flask, n is the number of moles of the gas, R is the ideal gas constant, and T is the temperature in Kelvin. The number of moles, n , can be determined from the mass of the condensed liquid and the molar mass, M , using the equation $n = \frac{m}{M}$.

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