

Sample Lab Report - Chemistry

Introduction:

This experiment aimed to determine the molar mass of an unknown gas by using the ideal gas law, $PV = nRT$. By measuring the gas's pressure, volume, and temperature under controlled conditions, we can calculate its molar mass.

Materials and Methods:

- Set up a glass tube containing the unknown gas connected to a pressure gauge and a water displacement apparatus.
- Measured the volume of gas collected over water, correcting for the water vapor's partial pressure.
- Recorded the barometric pressure and the temperature of the gas.
- Used the ideal gas law to calculate the number of moles of gas.
- Determined the molar mass of the unknown gas.

Results:

The collected gas had a volume of 55.2 mL, a barometric pressure of 760 mmHg, and a temperature of 25°C. The water vapor's partial pressure was calculated to be 24.8 mmHg. Using the ideal gas law, the molar mass of the unknown gas was determined to be 31.2 g/mol.

Discussion:

The calculated molar mass of the unknown gas was consistent with our expectations, as it fell within the range of typical molar masses for gases. The experiment's accuracy depended on the precision of our measurements and the ideal gas law's applicability under the conditions tested.

Conclusion:

The molar mass of the unknown gas was found to be 31.2 g/mol. This experiment demonstrates the practical application of the ideal gas law in determining the molar mass of gases and can be useful in various chemical analysis and research.