

Task 1: Measuring Molar Mass of CO₂ using HCl and Sodium Bicarbonate (NaHCO₃)

Write down the Ideal Gas Law Equation and define each variable.

Look up the value of the Ideal Gas Constant R, with units of $\frac{L \cdot atm}{mol \cdot K}$ and record it here:

Record all your measurements and observations for each trial in your notebook. Then record the relevant measurements in the table here. Always include units and proper sig figs.

	Trial 1	Trial 2
Mass of sodium bicarbonate (needs to be <0.50g)		
Mass of test tube "system" before reaction : Test tube and all contents (acid, gelatin capsule, sodium bicarbonate, stir bar)		
Mass of test tube "system" after reaction : Test tube and all remaining contents in grams		
Temperature CO ₂ (T _{CO2})		
Pressure of Room (Same as P _{CO2})		
Volume displaced water (Same as V _{CO2})		
Observations. What worked well, what didn't work well?		
What will you do differently or more carefully to improve measurements in next trial?		X

Task 2: Calculations for *Experimental* Molar Mass of CO₂. Perform your calculations for Trial 1 and 2 first in your notebook. Then in this table, record your calculations for Trial 1 and just your calculated values for Trial 2.

	Trial 1 Calculation (show all work and all units)	Trial 2
Mass of CO ₂ gas formed (m _{CO2}). Find the difference of test tube system before and after reaction which gives mass of CO ₂ that formed.		

Moles CO ₂ (n_{CO_2}) using Ideal Gas Law and Observations Watch your units!		
Experimental Molar Mass of CO ₂ using m_{CO_2} and n_{CO_2}		
Percent Error of Average Molar Mass		

In your own words, describe how displacing the water in the wash bottle allows you to calculate the amount of CO₂ generated. Draw a diagram to aid your explanation.

Task 3: Reflect on the experiment in today's lab

What were the advantages of using the wash bottle experimental set-up in today's experimental apparatus? What were the disadvantages? Comment on the adjustments you made to your experimental technique to improve your accuracy (percent error) in Trial 2?