GRAVIMETRIC ANALYSIS OF
A SOLUBLE CARBONATE

Name: _____   Date: _____   Station #:_____

Objective: To determine the molar mass and identity of an unknown metal carbonate using gravimetric analysis.

Procedure: As in CHEM 1105 lab manual, pages _____ .

Observations:

DATA:

Unknown number: _____

Mass of vial & sample (g)			
Mass of vial and ½ sample (g)		Mass of sample for run 1	
Mass of empty vial (g)		Mass of sample for run 2	

	Run 1	Run 2
Mass of empty crucible (g)		
Mass of crucible + precipitate (g)		
Mass of precipitate (g)		

CALCULATIONS:

Show a full set of calculations for one run only. Write the answers only for the second run.

i) The molar mass of calcium carbonate:

ii) The number of moles of calcium carbonate obtained:

iii) Write a balanced chemical equation, and use it to determine the number of moles of unknown metal carbonate:

iv) The molar mass (g/mol) of the unknown carbonate is:

v) The average molar mass of the unknown is (If the two molar masses do **not** agree within 10 grams, do not average them; simply report the two values):

vi) As you are told the unknown metal is an **alkali metal**, the formula of the unknown metal carbonate must be M_2CO_3. Therefore, calculate the atomic mass of the metal using the atomic masses of oxygen and carbon:

vii) Suggest the identity of the unknown metal M:

viii) Now calculate the % difference between the expected molar mass of your <u>metal carbonate</u> and the molar mass of the metal carbonate you obtained experimentally:

RESULTS/CONCLUSION:

unknown # _____	RUN 1	RUN 2	Average (or Best Value if one run had known error)
Calculated molar mass of metal carbonate _____			

QUESTIONS:

1. Imagine some of the solution was lost by placing a stir rod containing some of the precipitate on the counter. In what way will this affect the calculated molar mass of the metal carbonate? *Explain by discussing if the molar mass will increase, decrease, or remain unaffected, and why, based on each step of calculations.*

2. In what way will the calculated molar mass be affected if the precipitate is **not** heated to constant mass? *Explain as above*.

3. What chemical is being driven off as we heat a sample of calcium carbonate to a constant mass?

4. Why is the mass of the crucible not determined while it is hot?