Lab: Gravimetric Analysis of a Metal Carbonate

Context:

A bottle containing an alkali metal and carbonate, M_2CO_3, is unlabeled in the stock room. As rock star AP chemistry students, you and your peers will analyze the compound using gravimetric analysis and determine the identity of the metal.

Useful information:

- The compound is soluble in water.
- Alkali metal carbonate compounds are hygroscopic.

Prelab questions:

1. What is gravimetric analysis?
2. What information leads you to believe that the carbonate compound contains an alkali metal? What other element/ion could it contain?
3. What does hygroscopic mean? What does this mean for your sample of the alkali metal carbonate?

Safety considerations:

What general points can you make about staying safe in this experiment? What are some specific safety concerns about the chemicals?

Materials:

- Unknown metal carbonate, ~ 2 g
- Calcium chloride solution, 0.20 M
- Distilled water
- Ring stand
- Funnel
- Stir rods
- Bunsen burner
- Crucible and lid
- Balance
- Beakers
- Drying oven
- Filter paper
- Clay triangle
- Tongs
- Watch glass

Experiment planning

Procedure:

Design a procedure to prepare the metal carbonate sample and determine the formula using gravimetric analysis.

Data/observations/calculations/graph:

- What qualitative data will you gather?
- What quantitative data will you gather?
- What calculations are required to answer the question?
- What balanced equations can you write?

Other lab report requirements

Beginning question

Claim

Evidence and reasoning

Errors and improvements

How do you know there are errors? Can you quantify them?

Reflection

Presentation