

Gravimetric Lab Report

Dixie State University

Chemistry 1215-50

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Procedure:

1. Weigh 1 empty beaker.
2. Mass 1g of the unknown metal carbonate and place into beaker
3. Add 100 mL of deionized water to the beaker and stir to dissolve the unknown metal carbonate.
4. Add 50 mL of calcium chloride solution to the beaker and allow the precipitate to settle.
5. Mass a piece of filter paper and fold into quarters. Wet with deionized water.
6. Decant the liquid using a glass stir rod and deionized water to get the remaining precipitant out of the beaker.
7. Transfer the filter paper to a watch glass and place it under a heat lamp. Once dry, mass the cooled precipitate and repeat this step 2 more times.

Results:

Initial mass of unknown metal carbonate - 1.007g

Initial mass of filter paper - 1.588g

The table below shows the mass of the filter paper with the unknown metal carbonate after drying.

Filter Paper	Mass
Initial Mass	2.595g
1st Mass	2.386g
2nd Mass	2.306g
3rd Mass	2.256g
4th Mass	2.245g

The moles of CaCO_3 :

$$2.245\text{g} - 1.588\text{g} \times 1 \text{ mol } \text{CaCO}_3 / 100.086\text{g } \text{CaCO}_3 = 0.006564 \text{ mol } \text{CaCO}_3$$

Molecular Weight of Unknown:

$$1.007\text{g} \times 1/0.657\text{g } \text{CaCO}_3 \times 100.086\text{g } \text{CaCO}_3 / 1\text{m } \text{CaCO}_3 \times 1\text{m } \text{CaCO}_3 / 1\text{m } \text{M}_2\text{CO}_3 = 153.4042648\text{g/m } \text{M}_2\text{CO}_3$$

$$153.4042648\text{g/m } \text{M}_2\text{CO}_3 - 60.0\text{g/m } \text{CO}_3 = 93.40426484\text{g/m } \text{M}_2 / 2 = 46.7\text{g/m } \text{M}.$$

This points towards Potassium being the unknown metal carbonate. This is because the molecular weight of Potassium is 39.098g/m which is the only metal carbonate with a weight close to 46.7g/m that has a charge of +1.

Discussion:

$46.7\text{g/m } \text{M}$ was the final measurement from the calculations in this experiment. Although the conclusion was that Potassium was the unknown metal carbonate, the measurement was still 7.6 off. This is most likely due to not boiling the metal carbonate. We were unable to boil the metal carbonate due to a lack of crucibles. This would mean that the initial weight of the metal carbonate would be higher because of the water molecules that are trapped in between the potassium molecules. This would be fixed if we boiled the metal carbonate to release the water molecules.