

Determination of Reaction Stoichiometry

The stoichiometric ratio between $\text{Pb}(\text{NO}_3)_2$ and KBr will be determined by the method of continuous variations (Job's Method).

Principles

Stoichiometry, as we have learned before, is the branch of chemistry that deals with the ratio between reactants and products in a chemical reaction.

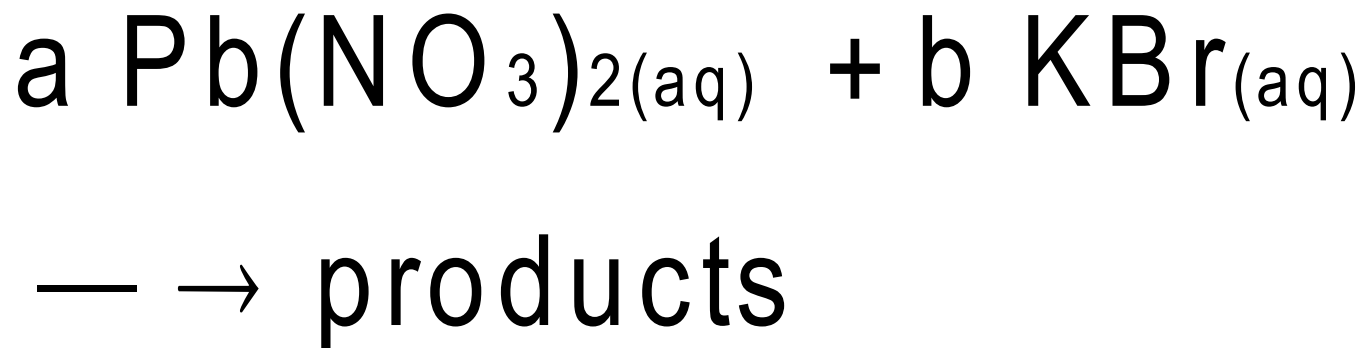
Principles

In order to determine the stoichiometric ratio, some quantitative property must be measured.

Could use temperature, volume, mass, or pressure changes.

Principles

In this Lab we will use the amount of precipitate, or solid product, given off.



Principles

The amount of precipitate can be graphed versus the number of moles of reagent.

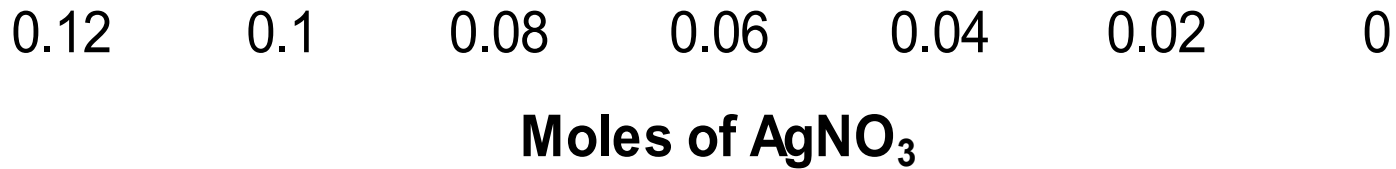
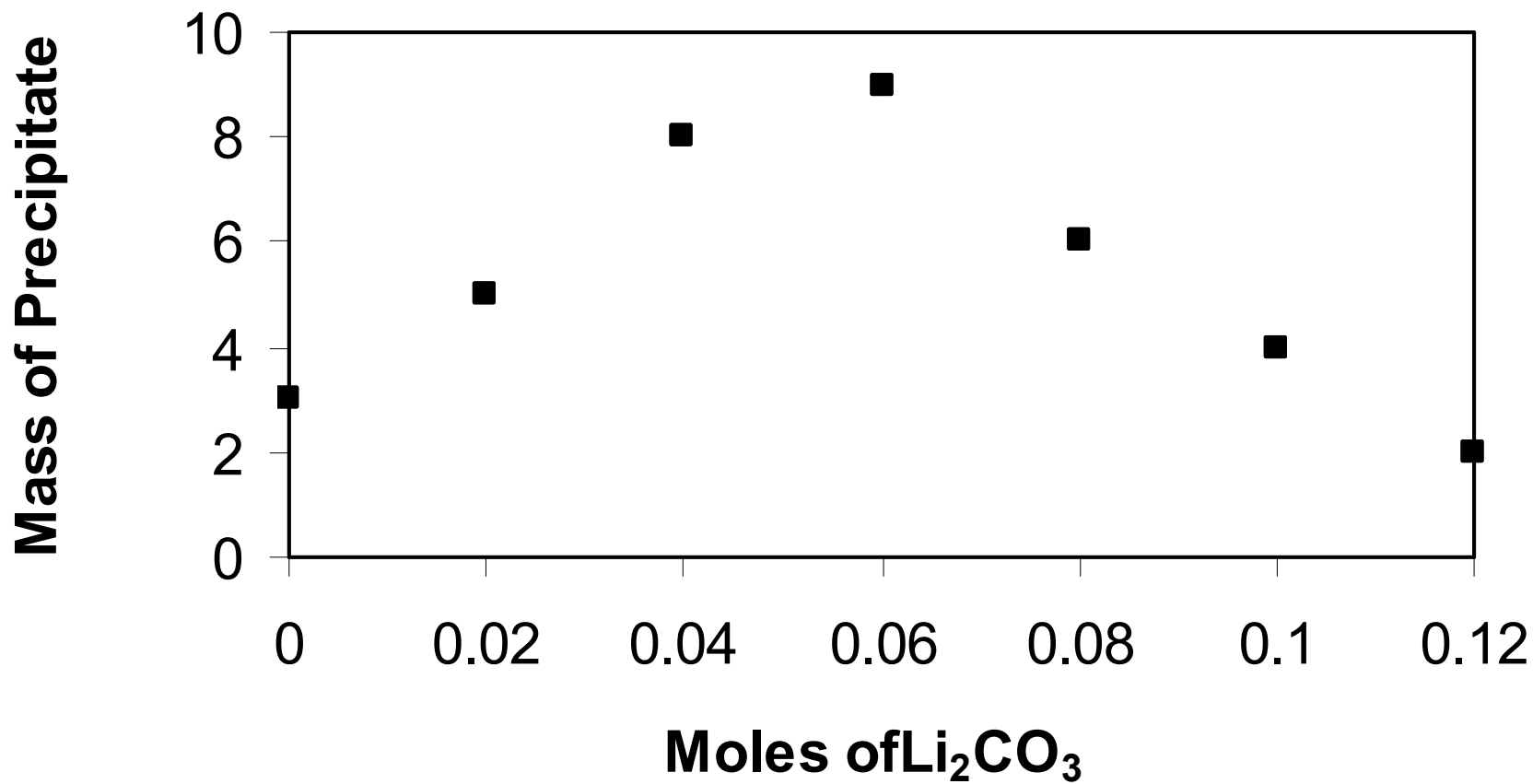
From the graph the stoichiometry can be determined

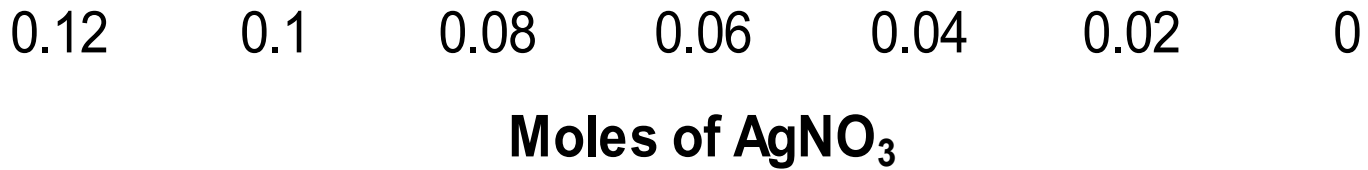
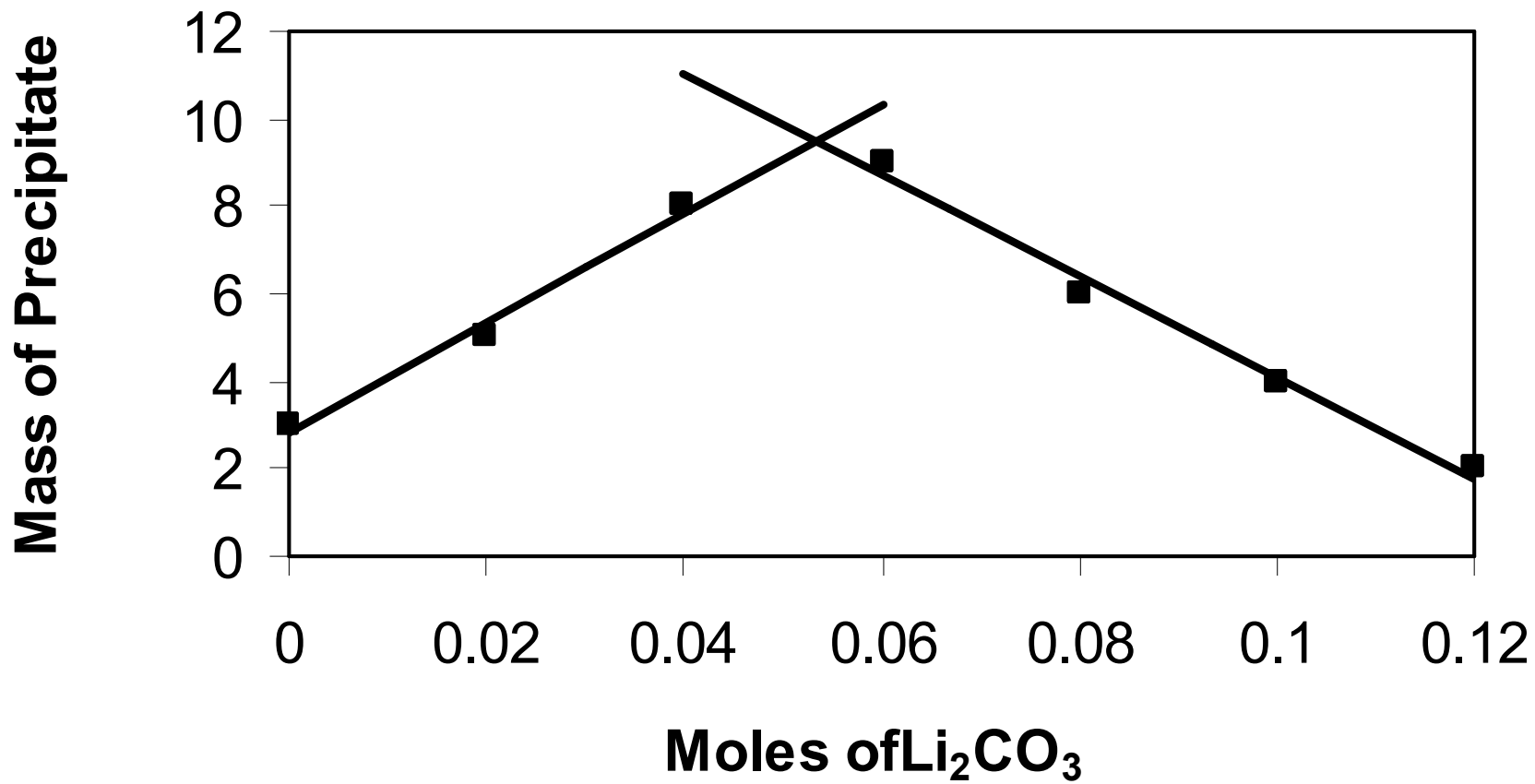
Calculations

Number of moles of reactant:

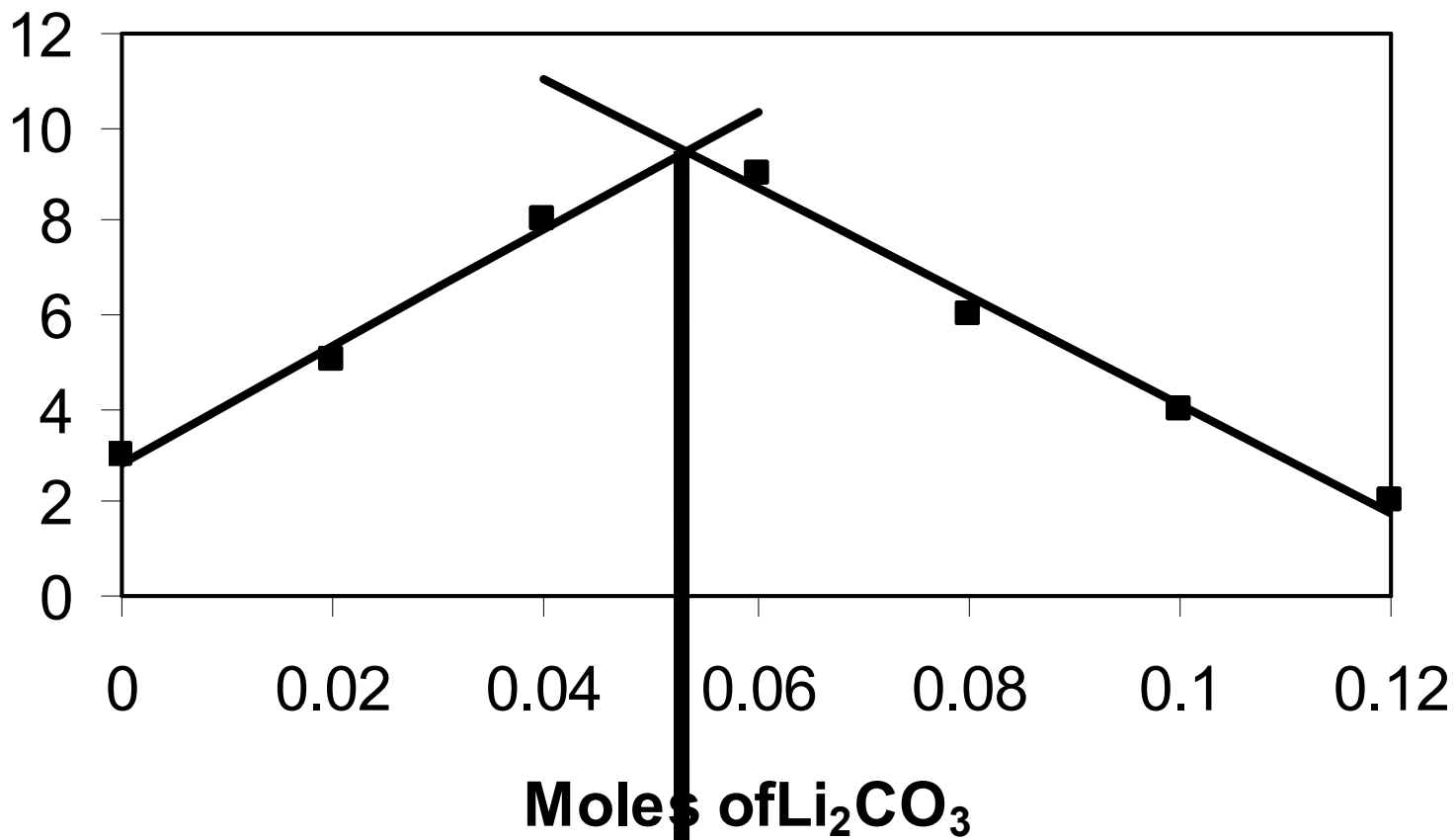
$$\text{Moles} = M V$$

$$\text{Moles} = (0.5\text{mol/L})(0.020\text{L}) = 0.010 \text{ moles}$$





Mass of Precipitate



Procedure

One reaction will be assigned to you by your TA

Measure appropriate amounts of $\text{Pb}(\text{NO}_3)_2$ and KBr and combine in one beaker

Procedure

Weigh a piece of filter paper and a watch glass.

Fold the piece of filter paper in half, and then in half again.

Procedure

Open one side of the paper forming a cone.

Place the cone into a funnel.

Pour your precipitate through the filter paper.

Procedure

Use the rubber policeman to ensure that all of the precipitate is transferred.

Wash your precipitate with two 10ml portions of COLD water.

Procedure

Put the filter paper onto your watch glass and dry over a beaker of boiling water.

Weigh dry filter paper and watch glass.

Procedure

Dry again for 5 more minutes.

Reweigh

Repeat until you get constant mass.

Procedure

Do not leave the lab until you have given the TA your final results.

Obtain the rest of the class data after it is posted.

If you do not obtain the class data, you will not be able to complete the lab.

Safety

- It is important that you always keep your safety goggles on.
- Use caution around the bunsen burners.
- Keep loose clothing and hair away from fire.