Name:

Worksheet #1

Period:

Seat#:

Required Sections: (Refer to R-5 for guidelines and requirements. Make note of any specific changes given by your teacher in class) Prelab: All written in your lab notebook – Answer Pre-Lab Questions, Materials, Reagent Table, Procedures, **During Lab:** Data section - Draw a larger version of the data table shown in this handout in your lab notebook – make it big enough for good observations and data! REMEMBER TO PUT IT ON A NEW PAGE AFTER YOUR PRELAB SO IT DOESN'T GET COLLECTED BEFORE YOU CAN USE IT!

Post-lab: - Calculation section, Conclusion section, Discussion Questions section

Introduction

Sometimes during a chemical reaction you may have too much, or too little of a particular chemical. When this happens one reactant is said to be the "limiting reagent" and one is the "excess reagent." In this lab you will determine, through calculations, which reactant is limiting and which is in excess. You will then calculate your theoretical yield, perform the lab, determine your actual yield, and identify sources of error within the lab as well as ways to improve upon the lab to result in a better percent yield.

Pre-Lab Questions

- 1. Describe what a double displacement/replacement reaction is.
- 2. Write and balance the equation for the reaction of Strontium Chloride with Sodium Carbonate.
- 3. Write the net ionic equation for the reaction in Question #2.
- 4. Look up a picture of a Büchner Funnel being used with a vacuum filtration set up. Sketch a picture and describe how it works and why you would want to use this kind of set up as opposed to a traditional cone funnel sitting on top of a flask.

Materials

0.15M SrCl₂ .

0.25M Na₂CO₃

- Two pipettes
- Graduated Cylinder
 - Wash bottle with
- One 150mL beaker Two 50mL beakers distilled H₂O
- Büchner Funnel
- Filter paper
- Filter flask
- Rubber tubing
- Aspirator on the
- sink faucet
- Weigh boat

- Procedure
- Using a graduated cylinder, measure 15ml of SrCl₂ and put into the 100mL beaker. 1)
- Rinse the graduated cylinder with the wash bottle with distilled H₂O so nothing reacts in the graduated cylinder when you measure 2) the next chemical.
- Measure 15mL of Na₂CO₃ and add to the SrCl₂ in your 100mL beaker. 3)
- 4) Record your observations in the chart below.
- Separate your precipitate from your solute by using the filter set up shown to you by your teacher. 5)
 - Make sure you weigh your filter paper, weigh boat, and Erlenmeyer flask before you start! You will need this information at a. the end when weighing your products!
 - b. Make sure you wet your filter paper down before you pour!
 - C. Make sure to use your wash bottle to get all the products out of your beaker!
- Dry your precipitate in the drying oven over night 6)
 - a. Make sure you label which weigh boat is yours!!!
- Boil off the water from your filtrate until you are left with only a solid product left. 7)
 - Weigh the product left from your boiled off filtrate, and when dry weigh the precipitate you formed and dried in the oven overnight. a. Make sure you are recording all numbers necessary to do this!

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Mass of Filter Paper	Mass of Weigh boat	Mass of Flask	Mass of Dried Precipitate	Mass of Dried Filtrate
Observations	5/		ABLE	

Calculations

- 1. Calculate the number of moles of Strontium Chloride and Sodium Carbonate that were used. *Hint* Molarity is a concentration and the formula for it is Molarity = moles/liter
- 2. Calculate which reactant is the limiting reactant and which is the excess reactant.
- 3. Calculate your theoretical yield of both products.
- 4. Calculate your % yields for both products.

Conclusion

Be sure to address all relevant parts referenced in your R-5 handout! Please remember that "human error" is not a "thing." Be specific! Do not list any possible error that could have happened...think about what potentially happened in your lab group specifically!

Discussion Questions

- 1. Based on your net ionic equation, which chemical was your original precipitate product, and what were your spectator ions?
- 2. Explain how you were able to take your aqueous spectator ions and convert them into a solid that you were then able to measure. What was the formula for this product?
- 3. If a student failed to dry their precipitate in the oven long enough, how would this affect the percent yield? Why?
- 4. If a student failed to wet their filter paper down before filtering, how would this affect the percent yield of each
- product? Why?5. Hypothetical Lab Scenario:
 - a. If Marie started this lab with 10.7 grams of strontium chloride and 12.5 grams of sodium carbonate, what would her limiting reagent and excess reagent be?
 - b. What should Marie's theoretical yields be for each product?
 - c. If Marie actually got 6.95 grams of the sodium containing product, did she get a better or worse percent yield than your lab group did for that same product? Show the calculations to determine this.