**Chem 11 Lab: Predicting Product Yield** Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Question: Can we accurately predict the amount of product that will form in a chemical reaction?*** This is not a formal lab. Use this worksheet.

1. In this reaction you are going to add 3.0M hydrochloric acid to a sample of solid baking soda (sodium bicarbonate). Write a balanced equation to predict what will happen in this reaction:

Now, put a very small amount of baking soda on a glass dish. Add 2 drops of HCl. Observe:

|  |  |  |
| --- | --- | --- |
| Before | During | After |
|  |  |  |

1. Does the equation you wrote above match your observations? Revise your equation if needed. In the space provided here, write the balanced equation you’ve decided is correct:

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1. In the steps ahead, you will repeat this reaction in a larger quantity. Our goal is to add exactly the right amount of HCl to use all of the baking soda. Look at the reaction and your observations: how will you be able to tell when the reaction is finished?
2. You will repeat the reaction in larger quantities. Your goal is to figure out how many grams of NaCl are produced from the reaction of 3.0 grams of sodium bicarbonate with exactly the right amount of 3.0M HCl. Design a procedure for this process. What will you do? Which data will you record? When will you record it? **Take this procedure to your teacher for approval.**
3. Do the experiment, and record your data, observations, and any calculations you can do now) on your procedure page. **ATTACH THAT PAGE TO THIS LAB** BEFORE YOU HAND IT IN!
4. Once you’ve cleaned up, work with a partner to PREDICT how many grams of salt should be produced if all 3.0 grams of sodium bicarbonate react. Show your reasoning mathematically.
5. Show the work you used to calculate your MEASURED mass of salt:

8. Compare this number to your PREDICTED mass from Question 6. How close was your prediction?

9. Sources of Error: Considering the law of conservation of matter, give sources of error to explain any difference in mass. Would those errors make your numbers too big or too small?

10. Conclusion (Reasoning/Theory): Why does stoichiometry allow us to predict the amount of product in a chemical reaction? What principles are the stoichiometry calculations based on?