

Name: Key - Sample Data  
Lab Partners:

Date:

## Experiment IRON-COPPER SULFATE REACTION

### INTRODUCTION

In this experiment you will let iron filings react with copper sulfate solution. An excess of copper sulfate will be used so that all of the iron will be reacted. By weighing the amount of iron used and the amount of new substance formed you will be able to determine a quantitative relations between reactants and products for this reaction.



### PROCEDURE

1. Weigh a clean, dry 100 mL beaker.
2. Add approximately 10g of copper sulfate. You need not determine this mass precisely.
3. Add 25mL of distilled water to the copper sulfate crystals.
4. Place the beaker on a ring stand and warm the solution until it just starts to boil. Make sure the solution does not boil over. Remove the beaker with beaker tongs from the heat Place on a hot plate on the countertop.
5. Weigh out 2 g of iron filings.
6. Slowly add the iron filings to the copper sulfate crystals a little at a time. Stir constantly. It should take about 7-8 minutes to add all of the iron filings.
7. Wash the product 3 times with 10 ml of distilled water. Carefully decant after each washing.
8. Place your sample with your name on the beaker in the bin which your teacher instructs you to. Let your sample sit overnight to dry. Weigh your sample the next day to find its mass when dry.

### DATA TABLE

A Mass of empty beaker	48.79
B Mass of iron filings	2.03
C Mass of dry product and beaker	51.14



- A Mass empty Beaker = 48.79 g  
 B Mass of Iron = 2.03 g  
 C Mass of Dry Products = 51.14 g  
 Beaker

### PROCESSING THE DATA

1. Determine the moles of iron used.

$$\text{MM Fe} = 56$$

$$\textcircled{B} \div 56 = \text{_____ moles Fe}$$

$$2.03 \div 56 = \underline{.03625 \text{ moles Fe}}$$

2. Determine the mass of the product.

$$\textcircled{C} - \textcircled{A} = \text{_____ g product}$$

$$51.14 - 48.79 = 2.35 \text{ g}$$

3. Assuming the product to be copper, determine the moles of copper produced. MM Cu = 63.5

$$\text{Ans \# 2} \div 63.5 = \text{_____ moles Cu}$$

$$2.35 \text{ g} \div 63.5 = .0370 \text{ moles Cu}$$

4. Divide the moles of iron by the moles of copper, (Fe/Cu), to determine the mole ratio. Is this the ratio you should have found? Explain.

$$\frac{\text{Ans \# 1}}{\text{Ans \# 3}} = \frac{.03625}{.0370} = .979$$

Should have been "1"

5. From the chemical equation, the ratio of Fe/Cu is 1. Calculate percent error for the mole ratio.

$$\frac{|1 - \text{answer from \#4}|}{1} \times 100$$

$$\frac{|1 - \text{Ans \# 4}|}{1} \times 100$$

$$\frac{|1 - .979|}{1} \times 100 = 2.1\%$$

6. What evidence did you observe to indicate that some of the copper in solution remained unchanged?

There was a blue-green coloring in the beaker w/ copper

Sources of error: