FLINN SCIENTIFIC

Name____

Leftover Aluminum Wire Worksheet

Data Table

	Trial I	Trial II
Initial mass of $CuCl_2{\cdot}2H_2O$ (g)		
Initial mass of aluminum wire (g)		
Mass of "leftover" aluminum wire (g)		
Actual mass of aluminum reacted (g)		
Mass of evaporating dish + copper (g)		
Mass of evaporating dish (g)		
Actual mass of recovered dry copper (g)		

Results Table

	Trial I	Trial II
a. Moles of $CuCl_2{\cdot}2H_2O$		
b. Moles of aluminum that should react (theoretical)		
c. Mass of aluminum that should react (theoretical)		
d. Percent error for reacted aluminum		
e. Predicted mass of recovered copper (theoretical)		
f. Percent error for recovered copper		
g. Percent yield of recovered copper		

Post-Lab Questions and Calculations

1. Write the *balanced* chemical equation for the reaction that occurred between the aluminum wire and the copper(II) chloride solution.

2. Which starting material in the reaction is the limiting reactant and which material is present in excess? Show calculations and all work for your determination of this.

3. Complete the Data Table and the Results Table on page 4. Show all calculations on a separate sheet of paper, clearly indicating where each result came from for each box a through g.

4. What physical evidence do you have that shows that copper(II) chloride is, indeed, the limiting reactant?

5. Discuss reasonable and potential sources of error in this experiment.

6. Discuss potential reasons why the percent yield of recovered copper may be greater than 100%.

7. Why do you think that scientists add excess of one or more chemicals when performing a reaction rather than combine the exact stoichiometric ratio?

8. What factors do you think may lead scientists (in industry, for instance) to decide to use a certain starting material as the limiting reactant and another as the excess chemical?