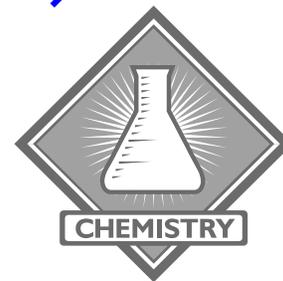


Name: _____

20 Pts.

Chemistry Lab: Mole Relationships and Limiting Reactant



I. Purpose:

Find the ratio of moles of reactant to product in a chemical reaction.
Relate a mole ratio to the coefficients in a balanced chemical equation.

II. Procedure:

1. Mass a clean, dry 150-ml beaker.
2. To this beaker add 6.00 grams of CuSO_4 . Record the actual mass of CuSO_4 .
3. Add 100 ml of water to the beaker and CuSO_4 .
4. Dissolve this mixture by stirring with a stir stick and warm gently (DO NOT BOIL) over a flame.
5. Measure out 1.00 grams of Fe filings onto a piece of weighing paper. Record the actual mass of Fe filings.
6. Stir the solution and SLOWLY add the iron filings to the dissolved CuSO_4 solution. Continue to stir.
7. Remove the stir stick from the solution by rinsing the stick back into the solution.
8. Allow the copper to settle to the bottom of the beaker.
9. Decant the supernatant into another beaker being careful not to lose any copper metal.
10. Wash the copper metal and decant the supernatant two more times for a sufficient wash.
11. Place a paper tag label with your lab group name on it and place it in the drying oven overnight to dry.
12. Day 2: Mass the beaker with copper metal.
13. Discard the copper metal into the waste beaker on the teacher's lab bench and wash your beaker.

III. Analysis:

Observations: Record you're a visual description of the reactants, the reaction and the products.

Data and Calculations: Show all work with units and sig figs.

Mass of empty beaker:	
Mass of CuSO_4 :	
Mass of Fe filings:	
Moles of CuSO_4 reacted:	
Moles of Fe reacted:	
Mass of beaker + copper: (Day 2)	
Mass of copper:	
Moles of copper produced:	

IV. Calculations:

1. Write a balanced equation for this reaction that includes phase notation. Classify this reaction.
2. Which reactant is the limiting reactant? Show your proof.
3. What is the mole ratio of copper to the limiting reactant? Show your work and describe with a written statement. How does this mole ratio agree with the coefficients in the balanced equation?
4. Based on the actual mass of limiting reactant that you used what is the theoretical yield of copper produced?
5. Calculate your percent yield of copper produced.
6. What mass of excess reactant was reacted in your experiment? (Stoichiometry)
7. Based on the total mass of excess reactant used how many grams were wasted?
8. What mass of iron(II) sulfate was also produced?

V. Conclusion Question:

What error is introduced into this experiment if the Cu product is not sufficiently washed with water?