Page 18

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6. Stoichiometry and Limiting Reagent

Purpose:

> To practice using stoichiometry and identifying and calculating the limiting reagent by reacting copper(II) sulfate with iron, determining the limiting reagent, and observing the reaction for precipitates and changes and calculating the percent yield and writing formulas using stoichiometry.

Procedure:

1. Place about 7.00g of copper(II) sulfate in a beaker.
2. Add about 50mL of water to the beaker.
3. Arrange the beaker and stand.
4. Carefully heat and stir the mixture in the beaker. The solution should be hot but not boiling. After all the crystals have dissolved, remove the beaker from the heat.
5. Add about 2.00g of iron fillings slowly to the hot $CuSO_4$ solution while stirring. Record observations.
6. Allow the beaker to cool for 10-15 minutes.
7. Pour off(decant) the solution into a different beaker. Pouring the solution down a stirring rod is recommended. Make sure not to disturb the solid product.
8. Add a small amount of water(at least 10mL) to the copper and stir.
9. Let the copper settle to the bottom of the beaker and decant again.
10. Dry the copper and mass it.

Data:

Mass empty beaker w/ tape	**Mass $CuSO_4$**	**Mass Fe**	**Mass Beaker+Copper**
117.25g	7.00g	2.00g	119.42g

Observations:

> Water was exactly 50mL, all other measurements were exact.

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