mf of element Cu: 0.1267g

Calculations

% Yield = $\frac{\text{actual}}{\text{theoretical}}$ x 100%.

= $\frac{\text{mf Cu}}{\text{mi Cu}}$ x 100%.

= $\frac{0.1267\text{g Cu}}{0.2534\text{g Cu}}$ x 100%.

= 50.00% Yield.

Conclusion

∴ The percent yield of copper was 50.00%.

Discussion

Sources of Error:

1) One of the reasons why the yield was low and not close to 100% was because copper must have been lost during the decants throughout the experiment. At the beginning of the experiment, the copper existed as very fine granules, making it very easy to lose while decanting. However, near the end of the experiment, the copper wasn't as fine, making it easy to decant without losing copper. Thus, you can conclude that most of the copper lost due to decanting was near the start of the experiment.

2) Another source of error occured when weighing the final mass of the copper. The dry, fine copper granules stuck to the sides of the beaker which essentially made it difficult to include the actual mass of copper while measuring the final mass on the scale. This may have altered the yield in a minor way. Similarly, during the reactions in the experiment, bits of the copper stuck to the sides of the beaker, making it difficult to transfer all the copper between subsequent reactions.

3) Lastly, when the 2g of Zinc was added to the copper sulfate solution, the solution did not become completely colourless after stirring. This indicated that there was still some copper sulfate in solution. Thus, when the solution was decanted, the potential mass of copper was lost in copper sulfate solution. This would be influential in the final mass and thus the percent yield obtained.