

Chem 1A – Fall 2019

Experiment 18

For the evaluation of results section, please include this in your analysis as one of the sources of error.

A significant source of error in this experiment is that solid hydrated compounds are rarely pure: the compound labeled $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (s) will also contain some $\text{CuSO}_4 \cdot 4\text{H}_2\text{O}$ (s) and some $\text{CuSO}_4 \cdot 3\text{H}_2\text{O}$ (s) (and other (smaller) numbers of H_2O).

- How will this affect the initial calculated molarity of the standard Cu^{2+} solution? Explain your reasoning clearly.
- How will this affect the concentrations of the diluted solutions?
- Will this error affect the accuracy of the data points on the graph? Will it affect the precision of the data points on the graph (Will it cause more scatter in the points)? Explain.
- How will it affect the slope of the line obtained? How will it affect the y-intercept of the line? (Draw a little sketch showing how the line will change.)
- How will this error affect the calculated M of the unknown solution – will it be too high or too low? Why?
- How will it affect the calculated mass percent $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ of the unknown – too high or too low? Why?

Reminders:

Make sure your graph follows all of the graphing guidelines in the "Checklist for Graphs".

Summary of Results section:

List the major results, but not the result of each step in the calculation.

Major results for this experiment:

- Molarity of standard copper solution
- Unknown number
- Molarity of copper in unknown
- Percent purity of unknown solid mixture

Evaluation of Results section:

Choose three or four sources of error that are specific to this experiment. Make sure to include the most obvious sources of error.

For each of the 3-4 sources of error, write a paragraph discussing the impact of that error, step by step. Which measurement would be off, and in which direction? Explain whether that error would make the final result (in this lab, the percent purity) higher or lower, and detail every step in your reasoning to explain why it would make that result higher or lower. Your goal here is to be clear and complete, so that I can see if you understand what you're talking about and so that I can check your logic. If you are vague or too brief here, points will be deducted.

Remember, one paragraph per error. This section should be at least 3 or 4 paragraphs long.