Instructions and Guiding Questions for Abbreviated Formal Report for Experiment 6 – K_{sp} of Calcium Sulfate

Abstract

- Describe in 2-3 sentences the type of experiment that was performed, what was measured, and why.
    - What are the final, most important results/findings of the experiment? Identify them and state them in the abstract.
    - Did the important results differ by method? If so, note that.

Results

- Provide the reader with a summary description of the observed data and overall results of this experiment, including the comparison of Ksp values determined from molarities to those determined from activities. Include tables in this section. Report all numerical results to the proper number of significant digits. Always start with an introductory paragraph. Never start with a table!
    - What are the most relevant data tables that need to be provided?
    - What trends and relationships between experimental data are you able to observe? Describe them in your narrative.
    - What similarities and differences are observed between methods for the final results?
    - Are there any anomalies or inconsistencies? If so, describe them.

Conclusion

- Provide the reader with a thorough explanation(s) of your results, based on the underlying theory for this experiment. The basis of your discussion is what you have learned about solubility equilibrium chemistry, the solubility product, , and the effect of ionic charge on the solubility product and the behavior of ions in solution.
    - Are the results observed in all parts of the experiment consistent with the underlying concepts and theories being studied and the experimental procedures you performed? If so why?
    - What molecular-level explanations can you provide that explain the observed differences in the K_{sp} values, if there are differences? If there aren't differences, what are plausible explanations?
    - How does your value for K_{sp} compare to the "literature" value of K_{sp} as determined using the Gibbs free energy, and the "true" value obtained from the CRC Handbook? If there are differences, provide explanations.

Sample Calculations

- Provide neatly handwritten (not typed!) sample calculations on separate pages for the following:
    - The molar concentrations of calcium ion and sulfate ion determined from your titration data.

- The value of K_{sp} from the molarities of calcium ion and sulfate ion.
- The activities for calcium ion and sulfate ion, including the calculations for ionic strength and activity coefficients.
- The K_{sp} from the activities of calcium ion and sulfate ion.
- The calculation of the "literature" value of K_{sp} from the Gibbs free energy, and the percent error for the "best" experimental value of K_{sp}.