

Experiment 29
Solubility Product of ZnC_2O_4

- **The Report is due Thursday, May 13.**
- **Formal Lab Report:** See the “General Lab Assignment Information” link on the top of this web site for more information about how to write a formal report.

Pre-Lab 10% Observations 10% Report 80%

Report Details

- This report must be entirely word-processed *except* for the calculations section which may be hand-written.
- If sections are out of order, you will lose credit. *No appendices!* Put the data table and the results table on separate pages – your calculation belong in between them!
- Objective
- Procedure. In addition to your regular procedure, if you changed your procedure in any way, state that here.
- Observations (including making your solutions). Observations are colors, odors, things that you notice during your experiment. This is not the place for a critique of technique, that goes in the discussion.
- Data – include data from making the individual zinc sulfate and ammonium oxalate solutions. If you put *data* in the results table or *results* in the data table, you will lose credit.
- Data includes 1) direct measurements made in lab 2) information obtained through a reference book- and cite the reference book or source and 3) “Given” information obtained from me (for example, the concentration of the KMnO_4).
- Calculations – can be hand-written. Include one set from your best titration and the calculation needed to make your 2 solutions – get info from your partner.
 - If you and your partner have close values, use all four values and average for your K_{sp} , or you can choose to only work with your data and obtain your average K_{sp} from your two values. I will leave this up to the individuals.
 - Include the calculations that lead up to making your solutions (ask your partner if you need information).
 - You need to determine the K_{sp} value for ZnC_2O_4 and show one sample for EVERY calculation (except for molar mass calculations) that lead up to that calculation.
 - EVERY calculation needs a header, verbal, and sample.
 - The accepted value for K_{sp} of ZnC_2O_4 at $25^\circ\text{C} = 1.38 \times 10^{-9}$. The source is David R. Lide, ed. CRC Handbook of Chemistry and Physics. 79th ed. New York: CRC Press LLC, 1998.
 - Calculate an average K_{sp} value and a % error (based on your average) for this experiment. You do not have to do a precision calculation or average deviation calculation as some of you are only working with two sets of data.
- Results table. Results are the answers from ANY subtraction, addition, multiplication, or any other algebra problem, and numbers obtained from a graph.

- Discussion section. 1) you should discuss the quality of your experiment (but don't tell me it went "really well" and that there were "no errors", or that it was a "bad lab day and the experiment was a disaster". Just comment on the likely errors in your particular experiment (as opposed to all possible kinds of errors) and leave the judgments as to overall quality for your supervisor/manager/professor. Besides likely mistakes, and errors associated with instrumentation (which are actually quite small), lab technique is something you can comment on. You can also comment on your results, if there is something to say. If there is a 5% error between your results and the theoretical/reference book value, no comment necessary. If your error is 20% or 200%, you should comment! At least let me know that you noticed! And consider....what could have lead to a large error? [assumptions, systematic error in technique...].

Conclusion- should be numerical and with associated error analysis (if there is one). It should mirror your objective.

The Reason for reports!

- All reports (for any class, project, internship or job) should be written with the audience in mind. Write at the appropriate level. For an internship or school project, never use slang in a formal report. Don't joke with your audience within your report - which is very different from a Presentation or Talk, where joking is sometimes very helpful and effective. Also, don't spend time telling people how great the work is - if it is truly remarkable, that will be noticed. If it is not, and you brag about it, that may backfire on you.
- All reports should have a point to make! Your point is stated in your objective. The reason for the report is to show me how you answered the question (the objective). You start by explaining a) what your experimental set up is (Procedure) b) what you measured (data) and noticed (observations) during your experiment, c) how your measurements and observations lead you to your results (via calculations and graphs) and then e) your overall take on the big picture - without editorializing! (Discussion) and ultimately, the bottom-line Answer (conclusion) to your original question (back to the Objective).
- Write your report so it is easy to read and comprehend. For example, when making tables, all columns should be aligned and fonts should be large enough to read (12 point is typical, but depends on the different styles of fonts). For these lab reports, write them as if you were writing to a student taking the same class from a different professor.