Chem 332L: PHYSICAL CHEMICAL MEASUREMENTS

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Classes: Every Tuesday, SGM 142 (This room)
9:00 – 9:50 lecture/discussion
10:00 – rest of the day

Office hours
ST: LJS 152: Thu 11-12 am or by appointment
ZP: LJS 151: Wed 12-1 pm or by appointment

The final course grade will be determined based on
• Six lab reports (70 %)
• 20-30 min. presentations during the lecture/discussion period (30 %)
Plan experiment - presentation

• Before starting the experiment, have a clear idea about the goal of the experiment.

• What do you want to investigate with the experiment? Theoretical background?

• How do you perform the experiment? Setup?

• What sort of data will you obtain? What units and typical values are you expecting?

• What do you interpret the data?
Perform experiment

• Do test runs to make sure everything works, and that the output data makes sense (matches expectations and calibrations).

• Start collecting data and make sure to graph data as you go, so you can see that you are filling plot evenly.

• Think about your “sources of error”, your precision in making the measurement and put these error bars on the plot as you make it. This will show you quickly whether you are making measurements carefully enough (size or error bar compared to data value plotted).

• Repeat the measurement multiple of times.

• Don’t just look to see if you get the “straight line” plot you expect.
During experiment: what to put into your lab notebook

• Recording all raw data and instrument settings. Record file names.
• Write down everything needed to reproduce the experiment.
• Record directly into the notebook. DO NOT USE SCRATCH PAPER!
• Use ball point (if you need to correct data, put a line through incorrect text and write correction alongside).
• At the end of the day, show your lab note to me or TA.
Lab Report

• Write up in word processor, send finished document to zailpeng@usc.edu.

• Lab report should describe the aim of the experiment clearly.

• Lab report should include sufficient data analysis.

• Lab report should state clear conclusion.

• Lab report should be self-sufficient – not depending on having the manual pages alongside.
What to Put in Your Lab Report

• **Abstract** to show a summary of your work (a couple of sentences)
• **Introduction** to review experiment and relevant theory
• **Methods** to describe instrument and material (schematic). Do not repeat what is in the lab manual
• **Results** to includes plots, tables, description of results explaining what you had, how you estimated errors and your analysis.
• **Discussion** to compare with theory, model and previous results. Fits to theory (parameters of the fit) for example rate constants, $r_{\text{H-C}}$
• **Conclusion** to summarize your experiment and finding (somewhat larger/clear statement of what you achieved and what was found).
• **References** to show the related materials to describe fundamentals of experiment, theory, previous data …