

FCH 381 Instrumental Methods of Analysis Lab Reports

Lab reports are to be handed in to me the Monday after each two-week lab is completed. Therefore, the lab reports are due on Mondays: **February 5 (Lab 1), February 19 (Lab 2), March 5 (Lab 3), March 26 (Lab 4), April 9 (Lab 5) and April 23 (Lab 6).** **Points will be deducted for lab reports that are late. There is no lab on April 25.** Your goal in writing the lab report is to clearly and concisely describe the experiment(s) that you conducted as well as the results that you obtained. A chemist should be able to use your lab report to successfully repeat your experiments. Therefore, when you write your reports, think about their content from the perspective of the reader. Each lab report should contain the following sections:

- 1.) Title Page** On this page, you should identify the name of the lab, the class (FCH 381), your name and the name of your lab partners, and the date.
- 2.) Introduction (25 pts)** This section should contain a brief background of the methodology used in the lab followed by a statement of the purpose and goals of the lab. Include pertinent chemical structures and reactions here.
- 3.) Method (25 pts)** In this section, you should reference the lab handout for details of the experimental method. In addition you should include the following sections **(a) standards** You should describe how solutions of the standards were prepared, if this information is not given (or is different) in the lab handout. **(b) apparatus** Provide a sketch of the instrument used, detailing the essential components. You should also list the instrumental settings that were generally used (e.g., scan speed, wavelength). **(c) procedure(s)** Describe any procedures that you employed that are different from that described in the lab handout (e.g., sample preparation/collection, derivatization reaction conditions, calibration methods). **(d)** Describe any sampling procedures (e.g., where the sample was collected and how it was collected).
- 4.) Results (25 pts)** The purpose of this section is to logically present your data and any resultant data analysis that you may have performed. Make sure to use text to present your results (do not only present numbers, calculations, etc). For example, in the chromatography labs you should show sample chromatograms here and label the peaks that you have identified, and identify the chromatograms with a figure number and a written description in the results section. You should also show a graph(s) of your standard curve along with the results of your regression analysis. You should include illustrative calculations to show how you derived values for various parameters (e.g., n). Also include sample calculations to show how concentrations of unknowns were determined. In your calculations, pay attention to the number of significant figures that you report. Also, be careful with your units. Finally, show the calculations for any error analysis that you performed. **Don't forget units!!!**
- 5.) Discussion (25 pts)** Here is where you interpret and discuss your results. What are potential sources of error in your lab (e.g., contamination)? When appropriate, how do your results compare to other investigators (i.e., literature values)-- are they significantly different? For example, in the spectroscopy lab, you are asked to compare your equilibrium constant with published values. You should also answer any questions posed at the end of your lab handout. If you detected unknowns that were not in your standard then discuss what they might be. How do your results from week 1 and week 2 compare (e.g., are the slopes of your standard curves significantly different?), etc.

Lab reports can be handwritten in your notebook (except for graphs) or typed as a separate lab report. If you submit hand written lab reports, I expect them to be legible. Points will be deducted if we cannot understand what you've written. Lab reports are expected to be handed in on time.

Points will be deducted for late reports. Grading will be based on content, clarity and neatness. For the lab reports, I expect you to know how to use Excel (available in the ESF computer cluster). Again, pay attention to significant figures. Also be sure to keep a good, detailed lab notebook. A well-written lab notebook simplifies that task of writing a lab report. It is also a permanent record of what you did in lab.