

FINAL WRITTEN PROJECT REPORT

WRITTEN REPORT

Your written report should be in the same format and have the same tone as a research paper published in a scientific journal. It should be an objective report of your results and interpretation. The required components of the final written report were detailed in the “Chemistry 329 Laboratory Project: Analysis of Phosphorus Concentrations in Lake Mendota” handout and will not be repeated here. However a few points should be emphasized:

Review the Experimental Objectives in “Laboratory Project Analysis of Phosphorus Concentrations in a Natural Water System” to be sure you have addressed all of the requirements of the project.

Experimental

This section should be *concise*, yet have enough detail and clarity that someone else could repeat your experiment. Do not repeat experimental procedures that are given in a paper or book chapter, rather you should reference each procedure and briefly explain any modifications that you may have made to that procedure. When a method has multiple options, be sure to explicitly state the option you are using in your analysis. This section should include information on:

- How, when and where you collected your samples and how you stored or treated your samples prior to analysis;
- Quality assurance measures you used to show that your samples and standards were not contaminated, including information on any standards, blanks and controls you used;
- The method you used to determine if your sample had matrix effects and the result of this experiment;
- Details on the experimental design you used for part 3 of the project.

This section must be written using paragraph format.

You may have modified your experimental procedure during the course of the project. If you are not using the results from a particular experiment, you do not need to report those experimental details. You need only report the details that correspond to the results you are reporting. During the oral presentation, however, you might be asked about the parts of your experiments that didn't work and what you learned along the way.

Results

This section should summarize your best results. Graphs, tables and equations will help you present your results in a clear and scientific manner. You must provide sufficient detail to justify the conclusions you make later.

Pay attention to scientific presentation of your graphs. That is, you should make careful decisions for axis markers, axis limits, the use of color, the data displayed, and so forth. If at all possible, plots that use color should be printed in color. The graphs/figures noted below are required. You may also have others, depending on your experiments.

- **One absorption spectrum for each of the phosphorus methods.** Plot both absorption spectra on one plot, and point out the wavelengths you used for each method.

- **One calibration curve for each of the methods.** Provide a calibration curve (absorbance versus concentration) for each method. Concentrations of phosphorus should be in units of mg P/L or $\mu\text{g P/L}$. Provide one plot for each method and use the same concentration units in both plots. Clearly indicate the linear region of the curve on the plots.
- **A relevant figure (pie chart, bar graph, scatter plot, etc.) that summarizes your results for part 3.**

' Discussion

The function of the discussion section is to interpret your data in relation to the original objectives or hypotheses. Your discussion should include answers to the following questions:

- Do your results support your hypotheses?
- Are your findings consistent with what others have shown?
- What are the limitations of your experimental design?
- What conclusions can you make based on your results?
- What is the next step in your study? What experiments would you do next?

'Include an Appendix in your paper that contains a sample calculation for each type of calculation you did in the project.

The Results and Discussion sections of your paper are the core of your paper and should be the longest sections.

'The Introduction, Experimental section, and Results and Discussion should together be about 5 to 8 double spaced pages. The abstract, figures, tables, references and appendix do not count toward this 5 to 8 page total.

ORAL PRESENTATIONS

You will present your results orally to your the instructors at an appointed time during the lab period. You can view these presentations as a friendly and informal discussion of your project.

Your group should prepare a *brief* presentation (5 minutes maximum) where you highlight your experimental method and anything of particular interest about the data. You do not need to provide any background or introductory material. Instead you should focus on what you did, your results, what you learned, and suggest any possible improvements.

The presentation will be followed by ~ 15 minutes of questions. The questions will, in general, be posed to specific individuals. While you may refer some details of part of a question to another group member, remember that all group members should be aware of what was done with all aspects of the project. The primary goals of the questions are to determine your understanding of the project itself and your analysis of your data.

You may refer to figures in your written report during the course of your presentation. (We will all have copies in front of us.) If you would like to use other visual aids (such as PowerPoint, overhead transparencies, or photocopies of a handout), you may, but you are not required to do so.