

**Laboratory reports:** These reports must be computer-generated, double-spaced, with 1-inch margins and 12-point font, STAPLED. No part of the report should be hand-written, including captions and figure numbers. Use complete sentences and proper American grammar and spelling. A formal laboratory report contains all of the sections listed below and in this order.

- **Title page (5 pts).** This should include an informative title, each group member's name and the section(s) they authored.

The body of your report should include each section below and start with these headings:

- **Introduction (25 pts).** This section begins with a statement of the purpose of the experiment. Look at what you are trying to find out in the lab. Then, discuss the theory behind the experiment, and include any useful or interesting background information about chemicals found in natural water. Cite sources.

Questions to answer as part of your introduction:

- 1) What role does phosphate play in the aquatic environment?
- 2) What are sources of phosphate in natural water supplies?
- 3) What is a calibration curve and how is it useful in this experiment?
- 4) What other methods could be used to determine the concentration of phosphate in water?

- **Procedure (15 pts).** The procedure should be brief but sufficient for the lab to be repeated by a competent scientist; it **should not** be step-by-step; it **should** contain pertinent information such as how you prepared your solutions, the concentration of the stock solution, amounts of reagents used, instruments used and what measurements were taken. Be sure to include the location where you gathered your local natural water samples. The procedure should be written in third person past tense. Correct example sentence: "The pH of the solution was measured using the Vernier Labquest pH probe." Incorrect example sentence: "I measured the pH of the solution."
- **Results (25 pts).** All data should be recorded in a table. Tables should be titled and include descriptive column heading, including units. All figures must have a title that briefly describes how the data in the figure was obtained and what it means, clearly labeled axes with units, appropriate tic marks, etc. Figures and tables must be numbered in order of appearance in your report. Show **one** example of **each** calculation.

Your report should include 2 figures: 1) spectrum used for the determination of  $\lambda_{\text{max}}$  and 2) the calibration curve. All rules for figures are included in the course syllabus.

- **Discussion/conclusion (20 pts).** State your conclusions (go back to your purpose, see what it is you were trying to find out, and clearly state your results) and explain them. All conclusions **MUST** be supported by your experimental results. Discuss discrepancies in your data. Outline any problems you encountered during the experiment, with possible changes for future experiments.

**Questions to consider when writing your discussion:**

- Does each water sample have the same concentration of phosphate?
- Why do you think your samples had the same or different phosphate concentrations?
- How accurate and precise was your calibration curve?
- How would you determine the accuracy of your unknown sample? If possible, comment on your accuracy and include your reference.

• **References (5 pts)**

- **All text should be the original work of each student. Any paraphrased material or quotes must be referenced in a works cited section. All sources used for theory, etc., should be cited. Plagiarism is not tolerated and will result in a 0 for the first offense and WF for the second.**
- Use in text citations to refer to what information in your report was taken from your references. Follow the ACS style (see document on D2L or here <http://pubs.acs.org/doi/pdf/10.1021/bk-2006-STYG.ch014>) . In text citations are covered on p. 287.
- Note: web sources are generally not acceptable. The **only** acceptable webpages that can be used as references are those sponsored or published by governmental agencies. (ie, Water Authority, EPA, NIH, etc). This means that Wikipedia and personal web pages are not acceptable.

*Reference Section – examples (see Table 14-2 in ACS style guide for other examples):*

1. Fechter, E. J.; Olenyuk, B.; Dervan, P. B. Sequence-Specific Fluorescence Detection of DNA by Polyamide-Thiazole Orange Conjugates. *J. Am. Chem. Soc.* **2005**, *127*, 16685-16691.
2. Hamelberg, D.; Williams, L. D.; Wilson, W. D. Influence of the Dynamic Positions of Cations on the Structure of the DNA Minor Groove: Sequence-Dependent Effects. *J. Am. Chem. Soc.* **2001**, *123*, 7745-7755.

**Overall quality (5 pts)**

- Be sure your report forms a coherent story and is free of spelling and grammatical errors. It should be presented in a professional format.

**Grading Scheme: 10 % of your final grade will come from the overall grade on the report and 10 % of your final grade will come from your specific part of the report for a total of 20 % towards your final grade**

**Lab report sections should be divided as follows for 4 member teams:**

- 1) Introduction including reference section    2) Procedure    3) Results    4) Discussion/conclusion

**If your group only contains 3 members, the person responsible for the procedure will also handle the results section**