

REPORT FORMAT

Some experiments will have a written format. Other experiments will have an oral report.

1. WRITTEN REPORT

IT IS TOTALLY FORBIDDEN TO USE PREVIOUS YEARS WRITTEN REPORTS (BIBLES)

Those students, who are proven to be guilty of this offense, will be graded either incomplete (I) or failed (F). See section on Ethics.

The written report **is limited to 10 pages, with spacing 1.5** and one-inch margins (not including cover sheets and Appendices). [Note: Only hard copies (no electronic versions) will be accepted.] It should be written in passive voice using past tense as appropriate. Procedures should be written in the simple past tense. The first person may be used if necessary for clarity. The **ACS Style Guide: A Manual for Authors and Editors** is an excellent source for elaboration of grammar, word usage and other aspects of scientific writing. The written report will consist of the following elements:

- A. Grade sheet
- B. Written report

On the first page print: Title of the experiment
Your Name (Your partner's name if partnered)
Your TA's name
Section MW or TR
Abstract

- (1) **Title.** This should be a brief, clear description of the subject of the report.
- (2) **Abstract.** This is a concise statement of the major results obtained. It should consist of *only* 2-4 complete sentences. It is best prepared after the rest of the report has been completed. Remember to briefly report your results, especially numeric ones. The abstract tells the reader what to look for in the lab report.
- (3) **Introduction.** The record of an experiment should begin with a concise statement about the experiment to be performed (historical background if there is any should be included here), with balanced chemical equations where relevant, and a statement about the goal of the experiment. The second page of the written report starts always with the Introduction.
- (4) **Procedures and Observations.** This is where you tell the reader what you did and saw and possibly what equipment you used if it was out of the ordinary. A clear and concise description of your procedures and observations based on your factual records. Be careful here, this is not an idealized form of the procedure from your lab manual or pre-lab but what actually happened. Clearly labeled sketches of experimental setups are usually preferable to lengthy descriptions. Particularly when describing a synthesis, attempt to use a style similar to that commonly employed in describing synthetic

procedures in scientific journals (e.g., "...a solution of 10.0 g of reactant A in 50 mL of anhydrous ether was added dropwise and with stirring over a period of 30 minutes, to..."). For each reactant, the correct name, formula, source, grade or stated purity, weight (or volume and density in case of a pure liquid, or volume and concentration in case of a solution), should be recorded. Standard data (m.p., b.p., etc., of reagents are not necessary. In addition, the volumes of any reaction solvents used should be specified. These data are very important and should be noted in table form. Don't forget to cover any safety issues.

(5) Summary of results. All data, yields, calculated results, etc. should be presented, preferably in tables or graphs if applicable. This is a tabulated form of your results and you should not be analyzing them here.

(6) Calculations and Graphs. A sample calculation should always precede results of calculations based on a formula. Notebook entries in this category should be done in the laboratory. Experience should soon convince you that, problems with quality, internal consistency, and data validity, which are detected immediately, are more quickly and efficiently rectified. Graphs should always be done separately on good quality paper referenced in your notebook. If you present a calculation at the least there should be a formula, sample calculation and final answer.

(7) Discussion The outcome of each experiment should be quantitatively and qualitatively discussed in relation to the goals of the experiment as stated in the introduction. You should:

- (a) briefly summarize the key results of each experiment;
- (b) explain the significance of your findings;
- (c) explain any unusual difficulties or problems, which may have led to poor results;
- (d) offer suggestions for how the experimental procedure or design could be improved by comparing your results to the procedures sections
- (e) answer all questions posed in the laboratory manual as part of the overall discussion-not as a series of questions and answers.
- (f) what are the sources of error and how did they affect your results
- (g) analysis of data and errors should be done here-- ALL ANALYSIS OF DATA IS TO BE DONE INDIVIDUALLY, even for the experiment where data is obtained with a partner. The reproducibility and precision of data should always be examined, and the major sources of errors identified. Detailed statistical analyses of error are rarely called for, but when possible, you should attempt to distinguish between systematic and random error.

(8) Conclusion. A very brief (1-3 sentence) conclusion to the experiment based on the data collected and analyzed. It's here that you need to summarize your results again. Did you achieve the goals in this lab?

(9) References. Present a numbered list of references to texts, monographs, journal article, and standard computer programs. Wikipedia is not a valid reference.

(10) Appendices. This is the place to put hard copies of computer output (tables, spectra, calibration curves). Each Appendix should have a number and a title and be referred to in the body of the report. If you have a table of results it belongs in the lab report and is part of your 10-page limit

(11) **Leftover unknowns and samples of prepared compounds** are turned in to your TA. Solid derivatives should be placed in a small vial and appropriately labeled: Student's name, Exp. No., Name of the compound.

Note: Spector Thomas, "Writing a Scientific Manuscript. Highlights for Success," *J. Chem. Educ.* **1994**, 71, 47-50 (appended at the end of this section) and the *ACS Style Guide* (available upon request), are very useful references for scientific writing.

2. **ORAL REPORT**

After completing the last experiment, you will present your results and analysis to your TA in the form of an **INFORMAL ORAL REPORT**. In this report, you should tell your TA briefly:

- the purpose of experiment;
- relevant theoretical background;
- what happened in **your** experiment;
- present your results and analysis;

Much of the preparation for your Oral Report will be the same as for a Notebook Report such as those you have turned in for earlier experiments. In particular, the data analysis, graphing and plotting, error analysis, etc. should be carried through to completion and the results should be presented in an appropriate form (tables, plots, etc.) for efficient communication. You will bring your lab notebook, raw data, analysis, results, plots, and any other materials that are appropriate for use in discussing your experiment with your TA. You also need the Experiment Grading Sheet. You may use any sources of help in understanding the analysis as well as any other aspect of the experiment.

You should plan on discussing your experiment for about 10-15 minutes. Be aware that it is impossible to present everything that you know about the experiment. Therefore, you should plan very selectively what you choose to present. During the last 8-10 minutes your TA will ask questions pertaining to your experimental work.

The objectives of the oral are to encourage you to learn as much as possible, and to find out how much you know in an efficient manner. In an informal exam of this type there is no substitute for knowing the material.

After analyzing your data and mastering the material, you will want to spend time organizing your presentation. You may want to use some notes, especially to guide you through theoretical discussions. You may use a blackboard if you wish. You may also just show your (neatly written) notes to your TA on occasion, rather than transcribe them onto the board. (This is especially convenient if there are many equations.) Do whatever makes you most comfortable, without wasting time. You will need to show your TA spectra, plots, etc. As always, attention should be paid to the presentation of data and results so that they are easily understood. Write neatly, label the axes of plots, indicate units, errors, etc. Some students prefer a poster presentation format.

NOTE: Overheads, slides, PowerPoint and other "high tech" forms of presentation are not permitted.

Report

Be prepared to give an informal but well organized, presentation. Your presentation should include the following elements, in sequence:

- Introduction;
- Background (why you did it);
- Experimental (what you did);
- Results (what happened);
- Discussion (including answers to questions posed in the manual);
- Conclusions.

The oral should not be a harrowing experience. Just tell your TA:

- what the experiment is about (briefly);
- what you know about it;
- what you did (briefly);
- what the results were, and why.

Ordinarily, you will not turn in your data, analysis, results, etc. However, you must do so if your TA so requests after your oral exam.

Your grade will reflect your ability to convince the TA that you understand the most important aspects of the experiment. The experiment-grading sheet will be used by the TA as a guideline for grading.

Oral report schedules will be posted on the 5.310 Stellar Website; Check the day, date, time, room number and topic of your oral Report. Plan to come to the assigned room approximately ten minutes prior to your scheduled Oral Report time. Your TA will come out for you and bring you into the presentation room. Please do not knock or open the door, as another presentation will be in progress.

Arriving more than 5 minutes late for a scheduled oral report, unless excused, will result in a 5-point penalty. Oral reports rescheduled due to an unexcused absence will result in a 10-point penalty.

EACH STUDENT PICKS THE DATE AND TIME FOR THEIR ORAL REPORT. ONCE THE DOCUMENT IS FINALIZED AND PRINTED NO CHANGES IN THE SCHEDULE ARE PERMITTED.

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Fall 2019

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