

GUIDELINES FOR A FORMAL LAB REPORT IN ORGANIC CHEMISTRY LABORATORY KIRK MANFREDI (1-13-03)

Being able to communicate your results is essential and requires a fair amount of work before it is perfected. When you are writing your lab report the goal is to allow the reader to understand your objective, procedure, experimental results and the conclusion, which tells the reader what you accomplished.

Your formal reports must be done on a word processor. You will often need to draw chemical structures and equations as well as insert graphs. These latter two procedures can be accomplished with software that is owned by the college (Chemintosh for Mac's and Chemwindows for PC's) and can be found on the college network server. There is a computer laboratory in room 214 MSH (its right across from my office). You will need to get a CNS computer account to get access. If you do not have an account let me know and I will make sure you get one. The computers in the college all have MS Office, Chemwindow, Kaleidagraph and Table Curve 2D. You are not restricted to these programs, but these are all we provide. Also note that you have disk space on the server where you can save your work.

Remember, the data you are using for your formal write-up should be kept in your laboratory notebook. I will ask you to hand in your notebook with the formal write-up. You can also use your formal reports on in class quizzes.

REPORT FORMAT

Scientific journals often differ from what perspective an article should be written (i.e., first person or third person). I would prefer that the reports be written third person, past tense. Number your pages. The computer program will do this for you. Figures, tables and graphs may be put at the end of the report. It is better to put them in the report where they belong, (i.e. after they are mentioned in the text) but I will accept them at the end. (The pages should still be numbered.) Do not place anything in the report unless it is mentioned in the text.

1) **Title and abstract page.** The first page of the report should contain your name, date and title of the experiment at the top. On the bottom half of the page you should write a 1 paragraph **abstract**. This briefly tells the reader what you did in the experiment, your results and a brief conclusion. Your goal is to do this in about 100 words. An abstract is required for virtually every piece of scientific literature written. They can often be difficult to write because of length limitations, but a good abstract can mean the difference between a paper being accepted or rejected and a proposal being funded or not. Its important to learn how to write a good abstract!

2) **Introduction.** This gives the reader background information on your experiment and what you did in the experiment and why. Do not confuse this with an "objective" which you will put in your laboratory notebook. Assume that your reader has chemistry background but might not know exactly what you doing. Explain it to him/her.

3) **Procedure.** This tells the reader what you did experimentally. It should essentially be a prose form of what is recorded in your laboratory notebook. It should contain a fair amount of detail such as glassware used, weights of reactants and products. Put any observation that you have in this section (e.g., it smelled bad..... it turned yellow, etc.). Don't put things like "weight of filter paper" or "weighed on the analytical balance", this information should stay in your notebook. Basically, the information in this section is a nicely written form of the "experimental / procedure" which is in your notebook.

4) **Discussion / Summary of results.** Report the important data here. For example, if the goal of your lab was to determine rate constants for a chemical reaction, you would report it here and give any details of the experiment. Discussion of spectral data, copies of GC outputs should also be included. If you have any graphs or tables they should also be put here. Never put a graph, structure, equation, spectrum or

table in a report without giving it a label and referring to it somewhere in the text. (e.g., Figure 1. ^{13}C NMR spectrum of oleic acid.)

5) **Conclusions.** This section summarizes what you did and tells the reader if you accomplished what you set out to do in the introduction. If, for example, you were given an unknown compound and did a series of tests to identify it, you would briefly tell the reader what your unknown was and how you came to that particular conclusion. You can also discuss problems associated with the lab and try to explain why things didn't work out the way you thought they would (if that's necessary).

6) **References.** On certain occasions you may need to site certain literature. For example, if you are identifying a compound based on its melting point, you should tell the reader what the literature value is for the compound and reference your source. You will also have to reference your lab book.

In conclusion, treat your formal write up like a quarterly report you are giving to your supervisor at work. You want to put your best foot forward when it comes time for promotion and raises. You can do great work, but if you can't tell me what you did, it's of little value.