

## Laboratory Report Format and Check-List

Organic chemistry laboratory write-ups are required for each experiment. They are either **Partial** or **Full Reports** as noted on each experiment handout. Most of the experiment for Chem 12A/B are Partial reports. The requirements and format for each type of report are described below.

**Partial Reports** – The following items are required and should be assembled and placed in the order listed below (before you staple them together and turn in).

1. *The cover page - typed:*  
Title of the experiment  
Authors  
Affiliation  
Date of Experiment
2. *Next – also typed:*  
Conclusions  
Analysis (of Primary Data) and Graphs or Charts  
Assigned Questions  
References
3. *Finally – not typed*  
Laboratory Notebook pages (carbon copy)  
Primary Data (chromatograms, spectra)

**Full Reports** – In addition to the items listed for Partial Reports, the following items are needed and should appear between the Date of Experiment and Conclusions entries and is also typed (any chemical structures or diagrams should be drawn with a drawing program – not copied from the internet!)

Abstract (see guidelines)  
Introduction and Background for the Experiment  
Experimental Procedure  
Results

All laboratory write-ups (**Partial** and **Full**) should be typed with double-spacing in a regular typeface (Times, Helvetica, Arial, etc., Don't use fancy or "interesting" fonts, even for the cover page). For **Full Reports** the structures of all reagents and products should be drawn using a chemistry drawing software program such as ChemDraw, ChemSketch, or ISIS Draw. The latter two of these are available for free (ask instructor about how to get a free copy).

Information about each section is given below.

### **Title**

The title should be descriptive, but not too long (and is the same as used in your notebook) – it should be the same as the title given on the experimental handout.

### **Authors**

Put your full name first, then any names of partners second (or third).

### **Affiliation**

Indicate where you performed the experiment (e.g., Department of Organic Chemistry, Hauser Laboratory, University of Colorado, Boulder, Colorado, *or in your case*, Department of Chemistry, Organic Laboratory, Laney College, Oakland, CA).

### Abstract (Full)

Probably the hardest part to write, the abstract is a concise statement that tells the purpose of the experiment, the essential elements of the procedure, and the results. The abstract is only one paragraph in length (and approximately five sentences). Consider writing this part last!

(A good reference for this is the *The ACS Style Guide. Effective Communication of Scientific Information*. Editor(s): Anne M. Coghill, Lorrin R. Garson. 2006 American Chemical Society)

### Introduction and Background (Full)

Provide the background for the experiment that was performed. Discuss and show all aspects of the relevant chemical reactions – the expected products, side-products and maybe even another example from the literature (your textbook, or another book suggested by the instructor). Other items to discuss are the experimental conditions that are normally used for the type of experiment you are describing and potential methods to identify your product.

### Experimental procedure (Full)

Provide a step-by-step account of the experiment the way you performed it. It should give all of the vital details necessary to be repeated by another person (i.e., somebody else should be able to repeat the experiment without having to ask you any questions). Save any discussion of the quality and quantity of your product for the Results section (below). Try writing the text in 3<sup>rd</sup> person (e.g., “The contents of the flask were heated...” instead of “I heated the flask...” or “The layers were separated and the organic layer was dried with sodium sulfate, then filtered...”)

### Results (Full)

Report the direct results from your experiment, such as primary data, with reference to what instrument or technique was used to obtain it. This might be presented in a table fashion. For a full report combine this section with your conclusions sections (i.e. Results and Conclusions)

### Conclusions

Discuss the results of the experiment. Of course give the percent yield and any information used to identify the product. Did you get the product? How do you know it is the desired product? What are the limitations of your method of analyzing the product? What would you do differently if you were to repeat this procedure? Give a final summary of the overall experimental procedure and the results of the experiment.

### References

Provide all references to the experiment and the procedure used, including any modifications and the information used in your introduction, using the correct bibliographic format for each type of reference. (see: <http://www.lib.usm.edu/research/guides/mla.html> if you are unsure) Usually, your source will be your laboratory textbook, however give the full correct citation.

### To turn in the experiment when it is finished

The instructor will sign your notebook to indicate that you have a complete prelab. Once you've finished the experiment both *you and the instructor will sign and date the last* page of the experiment – before you tear out your copies of the notebook pages.

Type your conclusions and any post-lab questions and include with your completed report. You'll find the required items for the conclusions and any questions for each experiment under the heading **To Complete the Experiment**.

Write any post-lab analysis (from data obtained in the lab) in the laboratory notebook. Attach copies of all relevant data, such as chromatograms or spectra. You must have copies of all items for each experiment. You'll find the required analysis for each experiment under the heading **To Complete the Experiment**.

Experiments are routinely due one week after the entire class has finished the laboratory experiment (note that some experiments extend for two lab periods). Full reports are due two weeks after the work in the laboratory has been completed.

## Laboratory Report Check-List

- \_\_\_ Name (at the top of each page?\_\_\_)
  - \_\_\_ Date (at the top of each page?\_\_\_)
  - \_\_\_ Purpose
  - \_\_\_ Outline
  - \_\_\_ Chemical Equations and/or Structures of compounds under study (if applicable).
  - \_\_\_ Reagent Table (if applicable)
  - \_\_\_ Picture or diagram of the apparatus that was used (should be a *schematic* not an artistic reproduction; mostly needed for a setup like a distillation apparatus; not necessary for just simple glassware like flasks and beakers)
  - \_\_\_ Observations and Data
  - \_\_\_ Conclusions
  - \_\_\_ Analysis of product (mp, bp, IR spectrum, etc.), actual yield, and percent yield
  - \_\_\_ Post-lab Analysis and/or Assigned Questions
- } Prelab done by day of lab (not during lab!)

### Follow the recommendations below when entering data in your notebook.

- \_\_\_ Only use ball-point or rollerball pen (***no pencils or felt pens***) for writing in your notebook (Remember to correctly move the separator page in your notebook so that you only make one carbon copy!)
- \_\_\_ Don't use "White-out" or correction tape in any laboratory notebook. You might lose points if you do!
- \_\_\_ If you make an error in a number or text simply put a line through it (don't obliterate it!) and write the correct value right above it or right after it. (e.g., ~~0.3456 g~~ 0.4356 g or "the flask was ~~heated~~ broken, so ...")
- \_\_\_ Don't copy the procedure from the textbook. Instead, in your Outline section give a brief summary for each step that you will perform.
- \_\_\_ Description of product (mp, color, powder or crystalline)
- \_\_\_ All numbers and units are separated by a space (e.g., 0.5 g not 0.5g, 25 mL not 25mL) Also, always add a zero to a number less than 1 (e.g., 0.5 not .5)