Writing a Good Lab Report - Organic Chemistry I

Lab report is an integral part of a chemistry lab. There are three components of writing a lab report.

1) **Pre-lab Work**

This should be typed and ready to submit when you come into the lab. It will be returned to you with your lab report after both are graded.

a) Your Name; Partner's Name
b) Title
c) Date
d) Purpose
e) Abstract
f) Table of Quantity
g) Reaction

2) **Flow Chart and Observations**

This is to be written in the carbon copy lab notebook. You should have the following in this notebook:

a) The title, date and your name at the top of every page in this notebook.
b) The flow chart.
c) Any relevant diagrams that you need for the lab.
d) The procedure or changes in the procedure. This has to be done while you are doing the lab. You should write all your observations during the lab here.
e) All your data taken during the lab.
f) Take care that the writing does not bleed through the carbon to the next page.
g) You cannot skip any pages in the lab book. All pages that you have written on during the lab have to be submitted.
h) All lab reports in this notebook MUST be written in pen only (no pencil). The color of the ink should be ONLY blue or black.

You will submit the carbon copy pages of this lab report after you have finished the experiment in the lab, and ***before you leave the lab***. These flow charts will not be returned after grading. These are the property of the chemistry department.

Remember: These flow charts are what you use as your guideline for writing your reports - not the lab text book.

3) **Lab Report**

This will be the typed report that you submit for grading. It should have the following components in the exact order listed below:

a) Pre-lab Write Up - you would have submitted this to me prior to starting the lab, so you don't have to submit this again; i.e. don't print those pages again.
b) Procedure - you will have to type this from the procedure and data you wrote during the lab. See in the table on page 3 for writing the procedure.
c) Calculations - show the calculations for theoretical and percent yield where the final product has been weighed.
d) Conclusions - this should reflect your purpose of the lab, explain your yield, data and analysis (mpt, IR etc.)
e) Attach any spectrum or analysis graph at the end of the report.

Document Typing Guidelines

1) All reports must be written in Times Roman font of size 12.
2) The entire report should be in 1.5 or double spacing.
3) The margin all around should be 1 inch.
4) In the header write "Your name", "Title of the Experiment" and "Date" in that order. The footer should have the "number of the page".
5) The printing should be in black ink on white paper only. All the pages should be of the same quality and color.
6) I don't need a title page. Your write up can begin from page 1.
7) General formatting - begin a new heading on a new page; the entire "table of quantities" should be on one page. You can move the reaction and the table back and forth to save space if you want to.
8) Staple the report only once in the top left corner.
9) Do not submit any blank pages or duplicate pages.

Writing the Product Label and Submitting Product

Any time a lab is done in which a product is isolated, it must be submitted for grading. The product can be submitted in a small vial. Alternatively, it can be submitted in a test tube or flask, if it is a large amount. The product container should be labeled. The label should be have the information given below. Place this label horizontally and just under the top edge of the container, unless it is a test tube.

Tips:

1) Write on the label with majority of the information before you place it on the vial.
2) Place the label closer to the top of the vial rather than middle or low.
3) Weigh the vial with the label and without the lid.

Sapna Gupta + partner	Benzoic Acid
Date: 09/29/2010	Mpt. ^{o}C: 120-123
Wt. of Vial: 13.78 g	
Wt. of Sample + Vial: 15.22 g	
Wt. of Sample: 1.44 g	

Your product will be graded on the following:

1) dryness of the product
2) color of the product
3) cleanliness of the product
4) how clean the sample container is
5) data on the product label (weight, melting/boiling point etc.)
6) how you place the label on the vial.

	Description	Points
Prelab - Typed and to be Submitted Prior to Starting the Lab (10 pts)		
Title	Title of the experiment (this can be the technique you are doing or the title from the lab book)	1
Date	Date that the lab is done. If lab is done over two weeks then give both dates.	1
Purpose	What is the purpose of the lab? Write this in 1 sentence.	1
Theory and Abstract	Theory: You should also include a few sentences on the theory behind the experiment you are performing. Abstract: This should include what you are planning to do, how you propose to do it and how you will analyse your product. Do NOT copy the procedure.	5
Table of Quantity	Make an actual **table** of all the chemicals you will be using in lab except water. You should have ALL the substances, including product, used in the lab, their physical property data. The data should be written in the following order. • name of compound • structure and formula of the compound. All ionic compounds and small molecular compounds can be written as is e.g. NaCl, HCl, CH_2Cl_2, Na_2SO_4; however you need to draw the structures of larger organic compounds. • for solutions: you must give the concentration in molarity or % solution. For solutions you don't need to write any other physical information below (mol wt, moles etc.) • molecular weight • amount used in grams • moles (in case of synthesis) • melting point or boiling point • density • solubility in water • if a commercial product is used then the brand name should be given. Make sure you check units! Include any special equipment (IR, Melting pt apparatus etc) below the table. Check MSDS online to get safety information on chemicals you will use in lab. This website has a number of links you can use. http://www.ilpi.com/msds/	5
Reaction and Mechanism	Write the reaction if you are doing any synthetic procedure. You don't need this part if no synthesis or chemical change is being done. • You should draw your reaction using a chemistry software. The best one (and free) that I know of is Chemsketch from ACD labs. You can download it on your computer and save the files. The structures can be imported into Word files. I will show you how to use in the lab. http://www.acdlabs.com/resources/freeware/chemsketch/ • You can use any other software if you wish to. • Under no circumstances should you cut and paste, scan or photocopy reactions from any source to submit in your lab report. All reactions should be drawn by you.	2
	Total Points	**15**

Lab Report to be Submitted the Week After the Lab		
Procedure	This portion is the bulk of your lab report. Try to write as many observations as possible DURING the lab. Write in detail as to what happened during the lab, all the weights, data, observations. There is a general tendency to forget what you did in the lab when you go home! You should take care of the following when you are typing the lab reports. You will be graded on the following: • Write in past tense third person, e.g. "2.50 g of benzoic acid was weighed" NOT "I weighed 2.50 g of benzoic acid". • Draw a setup if helpful to procedure - don't draw beakers or simple set ups like a hot water bath. • Include all the data in the procedure - not in a separate table. All your measurements/data should have the correct significant figures. • Explain "why" for techniques you have performed and observations you have made. • Write and explain any observations - write the colors, energy exchanges (exo or endothermic reactions) etc. • You should include time durations in case of synthesis or where appropriate. • Write ALL your data (weights, mpts etc) in the procedure. • Check all your general English spellings and technical spellings. • There should be a general order and readability of the report. • You should use the correct vocabulary for your reports. **<u>One word of warning</u>**: Do not copy the procedure from the lab text book. We make changes in the experiments sometimes. All those changes should be made in your flow chart while you are doing the lab. That is the appropriate way of noting alterations.	10
Calculations	This section should have all the calculations; weight subtractions from the data in your procedure, theoretical yield, percent yields and any other calculations. Make sure you have all the necessary units and significant figures.	4
Conclusions	Here you will explain what results you got from your experiment and compare them to what you were expecting. If you got what you were expecting, then great. If not, then explain why you did not get the expected results. In addition, cover all the details given below. • What do you think you could have done differently to get better results? • You should explain your % yield. • Analyze your data here: mpt, bpt and IR results. This is how you know that your product is the product. • Write any physical properties of your product (color, smell etc.)	6
Formatting	These are points given for the proper formatting of the report.	5
	Total Points	**25 pts**

Flow Chart and Observations/Data		
Flow Chart/ Lab notebook	This is the handwritten flow chart you will write out prior to coming to lab. 1. It is a brief flow of procedural steps you will perform during the lab. You can write this on the left half of your lab report. 2. Add any specific diagrams you need for the experiment. 3. Write your observations and data during the lab on the right column, so you don't have to keep writing the procedure in the lab. 4. You have to submit this to me before you leave the lab. 5. This will be graded on the flow chart and the submission of data. This should be legible, in proper order and have the proper data. 6. You cannot use any ink on the carbon copy.	**5**