

Grading for CHM 2201 Laboratory Notebooks

► Pre-Lab (25 points)

- 5 points: The following are at the top of each and every notebook page:
 - Statement of Purpose
 - Name
 - Title of the Experiment
 - Section Number
 - Lab Partner and Date
- 10 points: Reaction Sequence (when applicable).
 - Draw starting material and product structures with an arrow(s) pointing to the product(s) with appropriate stoichiometry indicated.
 - Assuming that you use the quantity of starting material for a reaction specified in the text (the actual amount you use may be different), show the calculation for the theoretical yield of product that you expect. You may also want to write the grams and moles of each reagent actually used under the appropriate structure so that by glancing at the reaction sequence, you could easily see this information. Likewise, once you carry out the experiment, you could put the theoretical and actual yields of the product under its structure.
- 5 - 10 points: Table of Physical Constants. Show all reagents and solvents used in the experiment and/or reaction sequence along with appropriate physical and chemical data. Also, point out any particularly hazardous reagents that will be used and describe any precautions that should be taken.
- 5 - 10 points: Procedure – short, succinct and in outline form (use bullet points to make clear if desired).
- 5 points automatically deducted if Pre-Lab is not handed in at the beginning of class.

► Observations (45 points)

Observations should be recorded in your notebook as you carry out your experiment. This means that you will repeat in more detail the actual procedure that you've previously outlined in the pre-lab. Your observation section will be more detailed and much longer than the pre-lab procedure. Record exact amounts of all reagents and solvents, the size and type of apparatus used, how and in what order you mixed the reagents, how long you stirred or refluxed the reaction mixture, how you quenched or stopped your reaction (by pouring into water, for example), any color changes that occurred, how you recrystallized the product, the boiling point of your product if you distilled it (if appropriate use a table displaying the volume of distillate collected and the boiling point range of the distillate), a drawing of your TLC plate showing starting material and product, the melting point of your product, etc. Attach IR and NMR spectra and GC traces to your notebook. **IN OTHER WORDS, RECORD EVERYTHING THAT YOU DO IN ENOUGH DETAIL SO THAT ANOTHER PERSON WITH A BASIC KNOWLEDGE OF CHEMISTRY COULD REPEAT YOUR EXPERIMENTAL WORK.**

- You must obtain the dated signature of the professor or TA before leaving the lab for the day. (5 points will be deducted if not done)
- Do not use personal pronouns (I, we, he, she, us, etc) when writing in your notebook. Instead of writing "I added 4 grams of phenol to 30 mL of methanol in a 100 mL round bottom flask equipped with a reflux condenser" write "To a 100 mL round bottom flask containing 30 mL of methanol and fitted with a reflux condenser was added 4 g of phenol."

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► Conclusions (30 points)

1. Your conclusions may be written after you leave the lab. The conclusion section should include, at a minimum, the following:
2. Results, such as % yields (show calculations) and comparisons between literature values for yields, melting points and boiling points, chromatographic, spectral data with those which you obtained.
3. Your interpretation of results which you consider to be unusual, or are not in agreement with those indicated in the text or by the instructor. You should focus especially on how errors or other factors might have contributed to the outcome. For example, if your yield was less than expected, could side reactions have caused the decrease? If so, show the side reaction and how it might be minimized next time. Did the reaction go to completion? Did recrystallization give a poor recovery? Etc.
4. Your evaluation of the experiment, and a brief summary of how you might improve your procedure if you were to perform it again.
5. Answers to assigned post-lab questions (if any).

General: In all of the above sections of your lab notebook, points may be deducted for lack of neatness. Handwriting must be legible or points will be deducted. Use a ball point pen or other writing instrument which insures that a clear, easily read duplicate is produced. Some duplicates are so faint that they are very hard to read.