

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 (where applicable).
 - Draw starting material and product structures with an arrow(s) pointing to the product(s) with appropriate stoichiometry indicated. Include solvent used above arrow.
 - Assuming that you use the quantities of starting materials 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 under the appropriate structure so that by glancing at the reaction sequence, you could easily see this information.
- 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).

► 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. Also, redraw the reaction sequence, only this time insert beneath the structures the quantities of reagents actually used in the experiment. 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 sections that are handed in for grading. **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.**

(Continued)

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."

You must obtain the dated signature of the professor or TA in your notebook before leaving the lab for the day.

► Conclusions (30 points)

1. 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.
2. 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.
3. Your evaluation of the experiment, and a brief summary of how you might improve your procedure if you were to perform it again.
4. 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.

NOTE: Your Instructor or TA may request more (or less) information to be included in your laboratory notebook.