

Guidelines for Report 1
Experimental Chemistry I, CH 361/CH 361H
Department of Chemistry, Oregon State University
Fall Term 2022

DUE DATE: 11:59 PM, Wednesday, Nov. 2 on Canvas

Please read the section titled "Integrated Laboratory Reports" in your CH 361 lab manual. Here you will find a rich source of information and advice on how to approach the lab reports in Experimental Chemistry.

Format:

For optimum legibility, please type your report in 11 or 12 point font with 1 inch margins. Times New Roman, Arial and Calibri are optimal fonts for ease of reading, but other fonts are acceptable. Single or 1.5 line spacing is preferred, with 2 spaces in between sections.

Length:

There is no pre-determined length that you must meet. However, most reports will be 4 – 5 pages, including figures/tables and references. You will not be graded on length; you will be graded on the substance and style of your writing and your data.

Tone & Style:

The report should be written for a professional audience, that is, someone who has a chemistry background but may not be an expert in this particular field. You can assume your audience is familiar with basic terms and techniques such as filtration, melting point, acidity, solubility, etc.

In general, when writing scientific papers, one should avoid the use of 1st person language (I/my/we/our pronouns). Reports should be written in the third person, using past tense, and whenever possible, an active versus passive voice. Aim to write simple, clear, and direct sentences. Scientific writing should not be "flowery" or "literary"; it should be precise and unambiguous.

For example:

"The crude acid melted over the range 108.5-111.0°C"

vs. "I measured the crude acid's melting range to be 108.5-111.0°C"

vs. "It was observed that the crude acid's melting range was 108.5-111.0°C"

"The unknown carboxylic acid dissolved completely in toluene at room temperature."

vs. "My unknown carboxylic acid dissolved completely in toluene at room temperature."

vs. "It was observed that the unknown carboxylic acid was completely dissolved in solution at room temperature"

Tables & Figures:

Please label tables, figures, graphs, schemes, etc., in chronological order, and include a descriptive title for each, e.g., "Figure 1: Potentiometric Titration Curve". When referencing this data in the text, refer to it using the appropriate label, e.g., "...the melting point data summarized in Table 2..." Always include a reaction scheme whenever a chemical transformation is performed. This may be hand-drawn, but it is better to use professional chemical drawing programs such as ChemDraw or ChemSketch, both of which can be obtained free of charge. Chapters 15 and 16 in the 3rd Edition of the ACS Style Guide provide excellent descriptions on how best to use and format tables and figures.

Parts of the Paper: (see Lab Manual, section titles “Integrated Laboratory Reports”)

Abstract This is NOT an introduction. No rationalization of the work is present. This is ONLY the major results. Hint: if we are giving you a grade for a result, it should be in the abstract!

Introduction This is where you lay out the “why” of the work. In this paper, you can provide the general flow of experiments that take the impure salt to purified acid and identify it.

Experimental Remember that you will be citing the specific pages in the lab manual that describe this in detail, but you do have to provide specific amounts of materials and reagents used and provide a narrative that someone could follow in order to reproduce your results.

Results You have a choice here. Often, Results can be included in the Experimental, or if the flow of the paper makes better sense to do so, combined with the Discussion. You may be well served with a separate Results section that makes use of tables to illustrate your findings.

Discussion This is where you interpret the data in the results. The first thing you must focus on is: did you achieve the goals set out in the Introduction? In this experiment, that is: what is the identity of your unknown and what is the chain of logic that leads you to that conclusion? While errors or uncertainty in any of the operations influence how you interpret the data, those errors are usually secondary to the overall goal (unless they prevented you from reaching a conclusion).

References:

As this course is designed to teach students professional standards and practices in chemistry, we require that you use the ACS citation format. (See the CH 361 course website for more information on this citation style). Keep in mind that whenever your report mentions observations that you did not make or conclusions drawn by others, it must be properly referenced. Whenever the phrase “literature value” is used, it must be followed with a citation. The best references are textbooks and peer-reviewed scientific articles. Avoid referencing websites. “Lecture notes” should never be listed as a reference. If you need help finding appropriate and credible references, the CH 361 Instructional Team is happy to provide assistance.

Writing, editing, revising:

These are three different activities, and one should not attempt to perform all three simultaneously! Good writing takes a good amount of time and effort. Please be kind to yourself (and the person reading your report!) and allow yourself ample time to write, edit and revise your report. You will most certainly generate several drafts before your final draft is submitted for a grade. We strongly encourage you to seek help from the OSU Writing Center, the CH 361 instructional staff, and/or your peers as you navigate the report writing process.

Other Notes:

The discussion section of Report 1 should clearly outline how you used your data to identify the unknown carboxylic acid. Remember, you are making an argument, and scientific arguments are always supported by data. You may wish to structure your discussion section using the framework shown below:

“Based on the melting point, there were 11 possible candidates (list those candidates, along with their physical data in a table); after determining the molecular weight, the list was narrowed to 4 possibilities; determination of the pKa narrowed the list to 2 possibilities; based on the melting point of the amide derivative, the unknown was confirmed to be _____”.

The discussion section is also the place to explain why you deemed certain pieces of data more or less reliable. Can you identify a source of systematic error? If so, explain how that affected the outcome of the experiment and/or calculation. It is not appropriate to list all the things that could go wrong; rather, you want to provide context and explanation for plausible and/or suspected sources of error and explain how those errors affected the data point in question.

Lastly, make sure you include your unknown # in your abstract!