

Basics of Scientific Writing

****Parts A & B are nearly identical to the CHEM 8L worksheets since W16. Parts C-E are unique to CHEM 8M. Bring this worksheet to the first lab meeting with Parts A&B completed (ok to bring the 8L worksheet). Save paper and print only what you need! You can begin part C before lab, but this must be completed before the end of the first lab.**

A good technical writer is concise, yet descriptive and does not confuse the reader by packing too much information into one sentence. Publication in any journal requires the authors to follow strict guidelines. It is unlikely that a paper will be accepted for publication if the provided guidelines are not followed. This document is designed to help students get started with proper technical writing skills. A significant portion of each lab report grade is devoted to proper writing, neatness, and organization (10-20%). Carefully review the guidelines for each section of the lab report.

Part A: Attention to Detail – complete before 1st lab meeting (OK to bring 8L worksheet)

- Choose one font, one font size, and stick to it (suggested Arial or Times New Roman, font size 10-12), except for changes to font size for headings. Otherwise, there are no specific font or document setting requirements for 108 lab reports.
- Use spell-check then have a human read it for anything spell-check may not catch (especially chemical names).
- Use subscript and superscript where appropriate (H_2O not H2O or worse H20; cm^2 not cm2).
- Give tables proper titles and headings. Tables should not span over two pages (get it on one).
- Avoid casual language. Words like “whatever” and “kinda” do not belong in technical documents!

Small mistakes can have a big impact on the impression of the author. Carefully read each sentence below, circle and correct each mistake.

- 1) The procedure for this experiment can be find on 40 and 41 of the attached lab notebook pages.
- 2) The results in this experiment show the different colors that can be obtained bye dying the fabrics.
- 3) The solution was kind of blue-ish.
- 4) Sodium dithionite (Na_2S2O_7) was the oxidizing agent.

Part B: Writing in the passive voice - complete before 1st lab meeting (OK to bring 8L worksheet)

Science writing, particularly technical writing, is unlike expository writing in that the passive voice is usually preferred in technical science writing. The passive voice enables the writer to maintain an objective stance when describing the purpose, procedure, results, and conclusions in an experiment. Objectivity can also be conveyed by avoiding the use of possessive pronouns like I, we, our, my, etc. **Past tense is used except when stating facts, which are in the present tense.** For example, "Limonene eluted first from the column, indicating that it is less polar than carvone."

Each example below contains far more words or information than necessary, not to mention inclusion of personal pronouns and unprofessional writing style. Carefully read, indicate the errors, and re-write the sentences properly.

1) *The whole meaning of this lab is determining the percent yield of the reaction and looking for the synthesis of indigo.*

2) *To begin the synthesis we had to place o-nitrobenzaldehyde into a beaker and add water and acetone into it. We used a magnetic stirring bar to stir it while we added NaOH solution. After a certain time we waited for it to cool inside an ice bath them remove it and drop it inside a Buchner funnel.*

3) The following are two different incorrect ways of writing the results sentence in a chemical synthesis. Reconstruct these sentences into one using the following format:

"Chemical name was isolated as a description of product (xx mg, xx % recovery)."

"*The actual yield of the blue indigo dye for this experiment was about 0.7 grams or about 70% of what was supposed to be yielded.*"

"*For the percent yield of this reaction we ended up with 70% of indigo synthesized, and the mass was 0.7 g.*"

5) "*Based on how it came out for me, I made plenty of mistakes so it did not come out the way I had hoped.*"

6) "*Me and my lab partner found that the beaker was the least accurate because the % error was the highest out of all of the glasswares at 27%.*"

Part C: The Abstract – for general reference, no abstracts in 8M reports

The abstract is an especially concise description of the experiment. It should briefly state the purpose of the experiment, including the experimental purpose to the learning objectives. The abstract should include a brief synopsis of the general experimental procedure (without using specific amounts or sizes of glassware), as well as a statement about the primary results and conclusions. **This can typically be accomplished in four-six brief sentences.** Use the following to gather the content of the abstract then construct concise, grammatically correct sentences to convey this information.

Purpose

What was the experimental purpose? This is typically, but not always, found in the experiment title. What were the primary learning objectives? These would be new techniques, principles, or reactions observed. Begin the abstract with the following:

"The purpose of this experiment was to (experimental purpose) so that (learning objectives)."

Procedure

This is the most challenging section to keep short but it is possible to convey the procedural guidelines in **2-3 sentences. Avoid run-on sentences!** Include the chemicals and techniques used. Do not include equipment unless it is significant to the outcome of the experiment (microcolumn, GC, TLC, etc.).

Results

Report the final result or results. Refer to the in-lab questions for guidance and decide on only the most important information to present to the reader (this will not be every result). Use one to two complete sentences to state the result(s) in words and numbers in parentheses with units.

Conclusion

How successful was your experiment? Were the results as expected? Do not assume the reader knows the expected result. This is not the place for emotions – avoid phrases like “I think the results were good”! Keep it factual and use only one sentence. The following are two suggested ways to begin the conclusion sentence.

"The experiment was successful / not successful based on..."

"The results were as expected / not as expected based on..."