

This document provides general guidelines for students enrolled in chemistry courses at Haverford College. It contains “default” standards for written such as lab reports, term papers, proposals, and senior theses. Instructors for individual Chemistry courses may give students instructions on written work that go beyond this document, or that instruct students to disregard parts of this document.

Authorship and Acknowledgements: Authors are those who claim intellectual ownership of the written report. Except for group projects, there should only be one author on a paper handed in for a grade. Students or faculty who assisted with experimental work or interpretation should be acknowledged in an Acknowledgements section at the end of the paper.

General writing: The college writing center may be able to provide advice on using correct grammar and a clear and concise writing style. You are urged to use a spell-checker and to proofread your *printed* document before handing it in; pictures and symbol fonts that show up on the computer screen are sometimes not printed correctly

Format: For ease of reading and grading, papers should be one-sided and double-spaced (3 lines per inch) with at least 1 inch margins and a font size of 12 point. Pages should be numbered in the upper right corner (it is OK to add the numbers by hand). It is acceptable to write by hand missing symbols and/or mathematical equations, and also acceptable to tape in figures.

Abstracts: When an abstract is requested, it should stand on its own and repeat what is in the rest of the paper. Abstracts should be short and summarize the main results and conclusions of the paper.

Chemical structures: Inclusion of chemical structures of the molecules you are writing about can dramatically improve the quality of a paper. Students should draw their own chemical structures and reaction schemes rather than relying on photocopies. Chemical structures may be drawn freehand or with structural drawing programs such as ChemDraw, ChemWindows or IsisDraw (the last is a freeware program; see Links from the Chemistry Department home web page).

Figures, Tables and Schemes: Figures should be numbered starting with Figure 1. Each figure should have a caption underneath that describes what is shown in the figure. When the figure contains a spectrum or other experimental data, its caption is a good place to include experimental details. Tables and schemes should also be numbered starting with 1. For these, the captions go above the table or scheme. Schemes are used for synthetic pathways and reaction mechanisms, and often have very minimal captions, such as just “Scheme 1”. The figures, tables and schemes may either be interleaved with the text or placed at the end of the paper (tables first, then schemes, then figures).

Use of copyrighted material: If you wish to publish your paper (or even post it on the web) you would need to get copyright permission to use a photocopied or scanned figure. When photocopies of journal articles or books are used as figures, a statement

such as “(copied from ref. 5)” should be included in your figure caption. Even when you use a photocopied figure, its caption should be your own writing rather than a copy of the original figure caption. Use of photocopied tables is discouraged. Data from a short table can be more easily reported using a table you type in and format yourself. In the case of large tables from the literature, it is unlikely that all of the information will be relevant to your own report, so again it is preferable to create your own, abridged, table.

Equations: These should be inserted into the text as they are introduced and numbered consecutively. The number of the equation is included within parentheses, as shown below for equation 1, which was produced with the MS Word equation editor.

$$\chi = \frac{nfe^{-2k^2\sigma^2}}{kr^2} \sin(2kr + \alpha) \quad (1)$$

References: It is very important that you clearly cite the source of the information you use in your paper. This is usually done using either footnotes (bottom of page) or endnotes (end of paper). If using footnotes, the numbering should be continuous throughout the paper (do not restart at 1 on each page). Use the citation style found in chemical journals; for example, see any recent article in the *Journal of the American Chemical Society*.¹ More details may be found in a book on reserve in the library.² The exact pages do not need to be cited for journal articles, but should be included for references to books. In published scientific papers, if the same article is cited several times, it is given the same footnote or endnote number each time the citation occurs.² Because this is logistically difficult (unless you invest in specialized software such as *ProCite* or *EndNote*) your instructor may allow you to submit papers with multiple complete footnotes to the same reference.

Passive voice and first person: Scientific writers generally use the passive voice and avoid the first person in writing Experimental sections. For instance, instead of writing “I added acetic acid (3.51 g) to the 100 mL round-bottomed flask”, the author might write “Acetic acid (3.51 g) was added to the 100 mL round-bottomed flask.” However, there is no rule that passive voice must be used in *all* scientific writing, and experts on writing suggest that the passive voice should be avoided whenever possible. [Let’s try that again: experts suggest that writers avoid the passive voice whenever possible.] So if you are describing experiments carried out by Smith and co-workers, “Smith et al. found that...” is better writing than “It was found that....” Also, there is nothing criminal about using “I” (or, in a co-authored paper, “we”); for instance: “one difference between my experiments and those performed by Smith et al. is the polarity of the solvent.” As another example, assume that you wish to propose a novel reaction mechanism (i.e. one that has not been made previously in the literature, to your knowledge). In this case, make it clear to your reader that this is your original proposal by writing “I propose the following mechanism:”.

¹ LeCours, S.M.; Philips, C.M.; de Paula, J.C.; Therien, M.J., *J. Am. Chem. Soc.* **1997**, *119*, 12578-12589.

² *The ACS Style Guide*; Dodd, J. S., Ed.; American Chemical Society: Washington, DC, 1986; pp 106-114.