

Guide to Writing Scientific Laboratory Reports

Chem 151L, Spring 2009

Report writing skills are an important part of a science education and will be required for any subsequent career in science. The ability to effectively communicate ideas and results is crucial whether one goes on to graduate studies, directly into industry, or into any area related to chemistry. The ACS Style Guide is an excellent source of information on writing a scientific laboratory report.¹ Text should be double-spaced, left- or fully-justified and written in the impersonal, passive voice. Written laboratory reports for this course will usually only be around five pages in length, not including figures such as spectra. Lengthy discussion is discouraged; just address the topic at hand.

There are seven distinct sections of a laboratory report or journal article and should follow the format of an ACS article in *Inorganic Chemistry* or *Journal of the American Chemical Society* (<http://pubs.acs.org/journal/jacsat>, also see links on the 151L website):

1) Title and Author. The title should be succinct and clear. It describes the experiment in approximately four to fifteen words.

2) Abstract. The abstract is a brief summary (one paragraph) of the experiment and should highlight outstanding features of the experimental results such as reaction pathway, characterization method(s) (just give name), spectroscopic results or difficulties that were overcome. Include the IUPAC name of the compound and pertinent quantitative results such as wavelength of absorption, extinction coefficient or percent yield. This section should be single-spaced.

3) Introduction. The introduction for 151L reports is generally one page in length. Some examples of the basic topics that should be addressed: 1) brief introduction to the subject material and its importance; 2) theory behind the method(s) of analysis, (include theoretical equations for calculations if not in a previous lab report); 3) objectives of the study; 4) choice of ligand. Use only proper literature references (i.e. journal articles or books, not URLs), number sequentially and place in the references section (see #7, below).

4) Experimental. The experimental section is written as prose (i.e. not point form) and uses the *past tense* and *passive voice* to explicitly and sequentially describe the actual experiment. For this course, you can reference the lab handouts instead of writing the entire procedure. Note any changes, however, that were made to the standard procedure.

5) Results and Discussion. The results and discussion section presents the data that was acquired in the experiment and interprets the data. All tables (M.W., color, % yield, M.P., ϵ and IR stretches should be tabulated) and figures must be properly labeled, sequentially numbered *and contain a suitable caption*. Spectra and graphs should clearly display axis labels and units. Experimental results are compared with those reported in

the literature when possible. Answer the questions in the handout, but incorporate into the discussion rather than answering one by one. This section may be broken into two separate sections if desired. In this case, the results section displays or summarizes the data collected, while the discussion section interprets the data.

6) Conclusions. What does it all mean? The conclusions are **not** a simple summary of the experiment, or a repetition of points that were made earlier in the report such as the abstract. It should be one paragraph in length, and tie together all of the data in a manner that makes some sort of statement as to the relevance of the results. Other possible topics include discussion of future work or development, or the efficacy of the method.

7) References. At least four relevant literature references should be cited. Scholarly, peer-reviewed, scientific journals and books are the primary source for these references; *websites are not a valid source* (but can be used beyond the four minimum). The writing format of the references should follow that found in the journal *Inorganic Chemistry*, *J Am. Chem. Soc.* or the ACS Style Guide.¹ The main method nowadays for finding literature on a desired subject is through scientific search engines to which the campus subscribes, namely SciFinder Scholar and Web of Science (links on the 151L website). These crucial search engines allow one to find specific desired literature, which is vast and ever-expanding. In addition, the Science & Engineering Library contains many hardcopy sources ideal for inorganic chemists,²⁻⁴ though note that reference texts may not be checked out. Some references will be placed on the 151L website.

References

1. The ACS Style Guide: A Manual for Authors and Editors; Dodd, J. S., Ed.; American Chemical Society: Washington, DC, 2006 (Science & Engineering Library, Reference Section, QD8.5 .A25 2006).
2. Chemical Abstracts; American Chemical Society: Columbus, Ohio, 1907- Present. (Science & Engineering Library, Reference Indexes and Abstracts, QD1.C43)
3. Dictionary of Organometallic Compounds, Buckingham, J., Ed.; Chapman & Hall: London, 1984. (Science & Engineering Library, Reference Section, QD 411 .D53 1984)
4. Encyclopedia of Inorganic Chemistry, King, R. B. (Ed.); Wiley: New York, 1994. (Science & Engineering Library, Reference, Chemistry Corner, QD 148 .E53 1994)