



These guidelines supplement the Guide to Submissions (published in *J. Chem. Educ.* 2003, 80, 1541 and at www.jce.divched.org/Contributors/Authors/Submissions/guideTo.pdf; they are also available on request from the *JCE* editorial office). Manuscripts that describe laboratory experiments should first follow the Guide to Submissions and then apply these Supplemental Guidelines.

Rationale

JCE receives many submissions that describe laboratory experiments. The broad range of experiments readers can find each month is one of our most important features. These supplemental guidelines have been designed to make published laboratory experiments as useful as possible to readers. They are based on these fundamental ideas:

- Peer review of a lab-experiment manuscript should be based to a large degree on the written and technology-based materials used by students in the laboratory, not just on a description of those materials.
- *JCE* will print the information a reader needs to decide whether to try to use the experiment; this includes information about possible safety hazards.
- Readers who decide to use a lab should be able to adapt it to their circumstances quickly and easily.
- Detailed information, including student materials, should be available in a format that is modifiable and easily adapted for use by faculty, students, and support staff who will use the experiment.
- Lab experiment submissions should describe experiments that students have done as part of the lab curriculum, not untested experiments being suggested for student labs.

What to Send

To support these goals we require that a laboratory experiment manuscript contain a Lab Summary and Lab Documentation (described in detail below) as well as an Abstract and Keywords. If, after peer review, a lab-experiment manuscript is accepted for publication, only the Lab Summary will be printed in *JCE*. The Abstract, the Lab Summary, and all Lab Documentation will be published via *JCE Online*. Lab Documentation is placed on the Web, as files that can be edited by those who adopt a lab and often as PDF files that can be displayed and printed by Acrobat Reader. Those without Web access can request printed copies of materials related to a particular experiment, which will be provided at cost.

Literature Search

Those who plan to submit a lab-experiment manuscript should first search the Annotated List of Laboratory Experiments, a keyworded database compiled by Carolyn Allen, Stanley Bunce, James Zubrick, and members of the ACS Division of Chemical Education Committee on Project ChemLab, available at www.jce.divched.org/JCEWWW/Features/Chemlab/. Next, search titles in the *JCE* Index online at www.jce.divched.org/Journal/Search/ to make certain that a similar experiment has not already been published in the *Journal*. Finally, search other journals and commercial lab manuals. Related experiments should be cited in the Literature Cited section; if a previously published lab is very similar, explain why the new manuscript provides information not already available to readers.

Lab Summary

The Lab Summary must be accompanied by an abstract, keywords, and Lab Documentation. It will usually include literature cited and may include tables and figures. (See *JCE* Guide to Submissions for details.) The Lab Summary should be no longer than two *Journal* pages (about 1500 words).

The Lab Summary should enable a reader to decide whether the experiment described would be suitable for a local course or program. It should briefly give a rationale for adopting the experiment and an indication of the course or level where the experiment would fit into a curriculum. The Lab Summary should briefly describe the procedures, techniques, facts, and concepts students will learn. It should explain how and why the experiment helps students learn and give typical results obtained by students who have done the experiment. It should list equipment, chemicals, and/or instruments that are not expected to be available in a typical chemistry department. Manufacturers and suppliers of equipment and chemicals should be included for reference. Consideration should be given to significant figures when reporting results or quantities used in the experiment section.

The Lab Summary must include a "Hazards" section that lists each hazardous substance or procedure and states the hazards involved. If there are no significant hazards, the Hazards section should say that.

Lab Documentation

Lab Documentation should include all material not available in the Lab Summary that would be useful to a reader who intended to carry out the experiment with students at the reader's institution. This section must include: written directions used by students; instructor notes to help the adopter of the experiment adapt it to local conditions; CAS Registry Numbers for all chemicals; complete information regarding potential hazards to students and instructors; and appropriate safety warnings in student directions. (If any of these are unnecessary for a particular experiment, the Lab Documentation should indicate that they are absent and explain why they are not needed.) If the experiment cannot be carried out without author-produced software, spreadsheet templates, or other technology-based materials, copies of these materials should be supplied in computer-readable format.

Examples of Lab Experiments already published in this format are available at *JCE Online*; go to www.jce.divched.org/Journal/Authors/laboratory/examples.html.

Summary

These supplemental guidelines for laboratory experiments are intended to make *JCE* more useful and attractive to readers by providing in print a clear summary of the experiment and providing online more detailed information in a form that can be used and edited by readers. The checklist that follows suggests how a submission should be structured; it is also at www.jce.divched.org/Contributors/Authors/Submissions/suppGuideLab.pdf.



Lab-experiment submissions should follow the *JCE Guide to Submissions* (www.jce.divched.org/Contributors/Authors/Submissions/guideTo.pdf) first and these guidelines second. There should be three parts:

Abstract/Keywords, Lab Summary, Lab Documentation
Each part should begin on a fresh sheet of paper and should be labeled Abstract, Lab Summary, or Lab Documentation.

For a new manuscript or a revised manuscript that has not been accepted for publication, submit **four** copies of each part. Submit four copies of any software on four disks. Do not

send the *manuscript* on disk until the editor specifically requests it.

If you have been notified that your manuscript will be published, either "as is" or with minor revision, and we have requested a version on disk, then send **three printed copies** along with the disk containing the electronic version. **The printed copies should match the electronic version exactly.** Two copies will be used by Project Chemlab annotators.

Please check that each item listed below has been satisfied by your submission.

- **Follow the *JCE Guide to Submissions*** regarding manuscript format (spacing, page margins and numbering, style for citing references, etc.) for the Abstract/Keywords, Lab Summary, and all Lab Documentation except materials handed out to students, which can be provided in the same format that the students receive.
- **Send four copies** of Abstract/Keywords, Lab Summary, Lab Documentation, and necessary software.
- **Include Abstract/Keywords** as for any nonlab manuscript (abstract of no more than 200 words). Include "Laboratory Instruction" as one of the keywords.
- **Include Lab Summary** for publication in print (approximately 1500 words). The Lab Summary should:
 - Explain why, based on your experience using this lab with your students, others would find it useful.
 - Indicate the course or level where the experiment fits into the curriculum and how long it would take to do.
 - State clearly and briefly the procedures, techniques, facts, and concepts students will learn; for synthetic experiments include the reactions and synthetic methods involved but not detailed reaction conditions.
 - Explain how and why the experiment helps the students learn.
 - Include results (tables, graphs, percent yields, etc.) typical of those obtained by students who have done the experiment (use appropriate significant figures).
 - Summarize evaluation studies or personal reflections that indicate whether the experiment achieved its goals.
 - List equipment, chemicals, and/or instruments used in the experiment that are not expected to be available in a typical chemistry department; give manufacturer's or supplier's name.
 - Include a section headed "Hazards" that lists each hazardous substance or procedure and states the hazards involved, or that states that there are no significant hazards.
 - Cite references to related experiments that have appeared in *JCE*, other journals, or commercial lab manuals, and explain how this experiment differs from them.
 - Summarize other information that would help a person considering adopting the experiment to decide whether or not to expend the effort needed to adapt the experiment for use at his or her institution.
- **Include Lab Documentation** for *JCE Online* in computer-readable form. Lab Documentation should include
 - Written material used by students (with appropriate warnings of hazards), such as,
 - Directions and experimental procedures
 - Report forms, or examples of student assessment tasks
 - Handouts containing supplemental or background information, or pre- or post-lab questions
 - Instructor notes (with appropriate warnings of hazards), such as,
 - Background information
 - Lab preparation and equipment needs
 - Directions for preparing solutions, instruments, and other apparatus
 - Tips for success and/or troubleshooting notes
 - Answers to any questions asked of students
 - CAS registry numbers for all chemicals (<http://www.cas.org/EO/regsys.html>; accessed Sep 2004)
 - Complete information about *safety and hazards* of the experiment
 - Author-produced, technology-based materials needed for students to carry out the experiment, in computer-readable form, for example
 - Computer software, spreadsheet templates
 - Mathcad, Mathematica, MATLAB, or Maple documents
 - Information needed to carry out molecular modeling or other exercises
 - Amplification of any items in the Lab Summary where additional information would help a user
 - Any references or citations that were not included in the Lab Summary but are needed by students or those who are implementing the experiment
 - Any other information needed to implement the experiment