

## Information and Outline for Article Submission and Publication

There are no special programming or formatting skills required to submit or publish articles in *The Chemical Educator*. Manuscripts may be submitted electronically or by hardcopy as explained below. Upon acceptance for publication, the final word-processor file containing the manuscript is often all that is required. Processing and formatting of the final manuscript will be handled in the editorial office. Full-color graphs, photographs, figures, color animations, video clips, student/instructor handouts and computer template or example files may accompany an article.

Articles should be submitted to:  
Clifford LeMaster, Editor in Chief  
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Boise, ID 83714  
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Questions may be sent by email to tce@chemeducator.org or answered by calling 208-440-1866 (fax 208-426-4493).

Authors submitting manuscripts should include all supporting materials and a cover letter containing their email address at the time of submission. Notification of receipt of the manuscript will normally be sent by email within two working days. Only original, unpublished articles, not currently submitted to other publications are acceptable. Authors are responsible for the accuracy of their contributions. *The Chemical Educator* will send the manuscript to three reviewers for consideration.

### Submission Guidelines

Authors wishing to submit hardcopy should send one original and three copies of each manuscript to the address above.

Articles may also be submitted electronically by one of the following methods:

- Mail a diskette, CD, or zip disk (Macintosh or PC) to the address above.
- Attach all required files to an email message (preferably in one compressed ZIP file).

The preferred electronic format for the manuscript is a PC or Macintosh word processor file. Postscript or Adobe PDF files are also acceptable for the reviewing process. A cover letter, which may be sent by email or conventionally, should list the filenames and their contents as well as the programs that created them (i.e., article.doc; manuscript, created with Word 2000) and include all author contact information including email address. For assistance with electronic submission contact the editorial office.

**Final Manuscript.** After acceptance, please include graphics files, preferably in TIFF format (or original prints), for all figures. If Microsoft Excel was used to produce the figures please include the native files. Please also include the signed copyright form (downloadable from *The Chemical Educator* site).

**Permissions.** If you are using materials for which the copyright is held by an organization or person other than yourself, you must obtain permission from the copyright holder in writing. This also applies to material that you have authored but for which you have transferred the copyright. When asking for permission please include the date of your request, your name, address, email address, telephone, fax number, the manuscript title, that the manuscript is to appear in *The Chemical Educator* published by Chemical Education Inc. in both electronic and print versions, and a full description of the material to be used (including journal/book reference).

**Keywords.** Please include a few keywords to help readers when searching for articles. The Editorial office will assign the category for the manuscript as the first keyword (e.g. Laboratories and Demonstrations). The following list should be consulted: Area (e.g. physical chemistry), Subtopic (e.g. quantum mechanics), Focus (e.g. harmonic oscillator), Pedagogy (e.g. active learning, case studies), Specific (e.g. quantum mechanical tunneling).

### Manuscript Format

The manuscript should be double-spaced with one-inch margins. There are no minimum nor maximum page limits for articles. All articles will begin with a title followed by the author's name(s) and affiliation(s) and a one-paragraph abstract. Indicate the author to whom correspondence should be addressed with an asterisk.

Due to the current limitations of HTML, which will be used for the Table of Contents and abstracts, avoid using special characters, symbols, equations, and chemical structures in the title and abstract. Use chemical names rather than formulas where possible. Special elements that are absolutely necessary will appear as graphics.

Equations, tables, and figures may be included in the manuscript in the order in which they are referred to in the text (do not flow text around these elements). References and notes should appear on a separate page at the end of the manuscript. Alternately, authors may elect to use the traditional order of manuscript, references, tables, figures, and captions to figures.

**Supporting Materials Section.** For manuscripts that include supporting materials, a description of the materials should appear in the "Supporting Materials" section that is located just before the reference section. Linking to these materials within the manuscript will appear at this point. Other supporting material, not discussed previously, may include syllabi for courses, course handouts, information made available to students online, or anything that makes an article more useful to readers. All supporting material files are also downloadable from the article's abstract page. We prefer to make this information available on *The Chemical Educator* website, even if it is available on another site. We will link to these materials from this section of the manuscript.

### Manuscript Elements

*The Chemical Educator* follows the recommendations outlined in *The ACS Style Guide (A Manual for Authors and Editors*, 2nd ed.; Dodd, J. S., Ed.; American Chemical Society: Washington DC, 1997) for manuscript formatting and

preferences. Exceptions and notable changes from our past format are listed below:

- Table row and column headings use sentence case capitalization. (The first word only.)
- Quotation marks, both double and single, generally go outside of periods and commas and inside of semicolons and colons. The question mark, exclamation point, and dashes go inside the quotation mark only if they are part of the quotation.
- Beginning and ending page numbers are now required for references.
- Links within the text must be referenced (see below).
- The preferred graphics file format is Tagged-Image File Format (TIFF), no LZW compression.
- Graphics *may* be embedded in your word-processor file but please include separate graphics files upon acceptance.

**Footnotes and References.** The use of footnotes is discouraged. Try to incorporate the footnote information into the body of the text. When necessary, this type of information can appear as a note in the "References and Notes" section.

Example of a *TCE* reference: Eagle, C. T.; Dearman, B. M.; Goodman, A. B. *Chem. Educator* [Online] **2003**, 8(2): DOI 10.1333/s00897030674a

Please include DOI numbers where available at the end of the reference preceded by a semicolon.

**Links and URL Usage.** Authors may link to other Internet sites from within their article but need to cite the URL in the reference section. See the ACS Style Guide for URL referencing. The link will be made active from within the reference section. Give the date that you last accessed the site (e.g. May 2003).

**Special Characters and Fonts.** The symbol font is preferred for Greek letters and other special characters not included in the normal lower/upper ASCII Times Roman font.

**Color Usage in Graphs and Figures.** Color may be used to differentiate data sets in graphs. Use dark colors (black, blue, red, green, and purple). Avoid using light colors such as yellow and light blue.

**Images.** Images may be submitted as photographs or as graphics files. Glossy black and white or color photographs will be scanned by *The Chemical Educator* staff and incorporated into the final document. Reviewer copies of the manuscript may contain photocopies (color copies for color photographs) or duplicate prints which should be attached at the end of the manuscript with captions on a separate page for their captions. Indicate in light blue pencil the figure number, principal author, and first three words of the title in an inconspicuous region of the photo or copy.

**Video Clips and Animations.** Short video segments or animations may be submitted as supporting material or as active figures for any article. Segments that are submitted as supporting material will normally be reviewed separately from the article and will not affect whether or not an article is accepted. Active figures are treated (and numbered) as any other figure in the article. The digitization of video creates files of enormous size. Try to limit the total playing time to one minute or less whenever possible.

AVI, MPEG, or Quicktime files are acceptable video formats. Typical parameters are 8–15 frames per second, 256 or 64 K colors, and a resolution of 160 by 120 or greater. Most animation file formats are acceptable.

### **To enhance the quality of your video presentation:**

- Always use a tripod with the video camera.
- Do not pan or zoom unless absolutely necessary.
- Use a contrasting backdrop to improve subject visibility.
- Adjust lighting to avoid shadows.

**Computer Files and Program Listings.** Examples of supporting computer files include spreadsheets, mathematical program templates (Mathematica, Maple, MathCad, etc.), molecular modeling, data acquisition, programming in languages, or examples from any computer software that facilitates the learning of chemistry. Normally, these materials will not be directly referred to in the manuscript, but will be available as supporting material. Native file formats will be used for commercial software packages and ASCII text files for program language source code and its input/output files.

### **A Special Word about Laboratory Experiments and Demonstrations**

Normally, articles containing laboratory experiments will begin with an introduction that addresses the experiment's purpose, the need it fulfills, and its uniqueness in fulfilling this need. The experimental section should describe the major instrumentation, chemicals, and supplies required and give a brief description of how the experiment or demonstration is performed. The Results and Discussion should be combined into one section followed by a conclusion and acknowledgments. Authors are strongly encouraged to submit supplemental information so that educators may easily adopt the experiment. This material should include specific background and experimental details as supplied to laboratory students. Some other examples of supplementary materials are: instrument parameters, relevant spectra, special disposal methods, vendor addresses for unusual chemicals and equipment, electronic diagrams, typical student results with standard deviations, sample calculations and data, common student problems or sources of error, and computer files and program listings. Please include CAS numbers whenever available.

### **Additional guidelines for reviewing articles on research in chemical education**

Research papers are normally held to more stringent criteria than are articles of general interest or reports on innovations. Like research in other fields, research in chemical education should be based on theory, involve the collection and analysis of data, and be generalizable. The main points that you should look for when reviewing chemical education research papers are:

1. Does the study represent valuable new knowledge that is relevant to chemical education, generalizable, and of interest to the readers of *The Chemical Educator*?
2. Is there a clear theoretical base or rationale for the study and an appropriate literature base?
3. Are the research methods well designed, appropriate to the research questions, and documented? and Is there sufficient information to duplicate the study elsewhere?

4. Does the article report on the data collected (for qualitative studies the data may consist of summaries and interpretations of interviews) and is the analysis of the data appropriate and complete?

5. Are the conclusions consistent with the data and are the implications of the results for the teaching of chemistry described?

For additional information on appropriate criteria for evaluating research in chemical education, see the following:

1. Eybe, H., and Schmidt, H-J. Quality Criteria and Exemplary Papers in Chemistry Education Research. *International Journal of Science Education*, **2001**, 23(2), 209-225.
2. Bunce, D., Gabel, D., Herron, J. D., and Jones, L. L. Chemical Education Research. *J. Chem. Educ.* **1994**, 71, 850-852, (report on the ACS Chemical Education Division Task Force on Chemical Education Research).