



American Mineralogist

Instructions for Authors

These guidelines explain the *American Mineralogist* publication procedures, standardized units, and style in brief. We have organized the information in helpful sections to make reference easier. A brief overview of the submission guidelines can be found on the inside back cover of each issue, highlighting recent changes. Remember editors, reviewers, and associate editors are all volunteers and vital to maintaining our standards of quality; therefore, make the most of their time and yours by following these instructions. Failure to adhere to these guidelines may delay submission, review, or production of your paper. For more information on Am Min's scope & mission, [click here](#).

Submit manuscripts to our [online submission site \(OSS\)](#). Note that updating your contact info on this web site does not "transfer" to the MSA membership database (contact the [MSA Business Office](#) to update your info).

Submissions must not be already published, in whole or in part, in print or online. [Click here](#) or read on if open access/open archive is desired or needed. All Open Access/Archive fees must be paid *before* publication, at the proof stage.

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MANUSCRIPT TYPES

Article Type	Notes	Page Limit**	Invite Only
Regular articles	Can be part of a Special Collection*	No set size limits.#	No
Letters	Rapid publication option for short manuscripts; Can be part of a Special Collection*; must require little or no revision	Limited to 4 typeset pages; tends to be less than 15 double-spaced pages, including refs, counting each fig. and table as 1 page.	No
Outlooks in Earth and Planetary Materials	A brief review of an emerging field of study, or a review of an existing field, emphasis on recent developments, forward-looking	Limited to 6 typeset pages or so; this tends to be less than 22 double-spaced pages counting each fig. and table as 1 page.	No
Crossroads in Earth and Planetary Materials	Interdisciplinary papers: a topic that falls at the boundary of the Earth Sciences, where it intersects other disciplines	Should be less than 50 double-spaced pages including refs, counting each fig. and table as 1 page.	No
Review Articles	Assemble previously published information and then analyze and reinterpret it in such a way so as to provide new insights	30 pages typeset; less than 100 double-spaced pages, counting each fig. and table as 1 page.	No
Highlights and Breakthroughs	Summaries that provide additional perspective on new articles that appear in Am Min	limited to one or two typeset pages (or less); tends to be under 4 manuscript pages	Yes
Mineral Matters	Short (one page) articles that review a foundational or transformative aspect of any journal-related theme. Targeted to students or researchers outside the discipline, and may be distributed by the society for educational or informative purposes. This article type is inaugurated to celebrate <i>American Mineralogist's Centennial</i> . A brief abstract of no more than 5 lines is required; attractive, compelling figures are highly encouraged.	1 page typeset	Yes; MSA Members Only
Discussion/Reply	Brief commentaries ("Discussion") on an Article, the author can respond ("Reply"). Only one round of exchange is allowed. Title your Discussion with the original title of the publication in question, and add "--Discussion" to the end. Title your Reply article with the original title and add "--Reply" to the end.	Discussion must be submitted with 12 months of the appearance of a paper in the print version of the journal. 2 journal pages, or 5 double-spaced, 12 pt font manuscript pages. Tables and artwork should be absolutely minimal	No
Book Reviews	View list of the titles available or contact the Book Review editor to suggest a title you wish to review	preferably 1 page typeset	Yes, contact Editor
Memorials	More info: http://www.minsocam.org/MSA/AmMin/Instr_Memorial.html		No

* [Special Collection info](#)

** Shorter papers = shorter review time, on average. For more information about Open Access and page charges, visit <http://www.minsocam.org/msa/AmMin/Financial.html>.

While they have no rigid size minimum or maximum, Articles tend to have a typeset length of eight to twelve journal pages. We expect papers to be written concisely, and even elegantly, to communicate the new and essential information in the most effective way possible. If the manuscript exceeds 50 pages (text, figures, tables), authors are encouraged to consider using the (free to authors and readers) electronic depository for some portion of the work (e.g., tables, figures, methods or part of methods, etc.), if appropriate. Contact the Editors with any questions.

AMERICAN MINERALOGIST INFORMATION FOR AUTHORS

Authorship Statement

Authorship is first a responsibility. Not all workers in a lab or office will want this responsibility although they may be delighted to help you, brainstorm, proofread, or other colleague aid. Authorship is defined as (1) substantial contributions to conception and design of the specific experiment, or acquisition of data, or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content; or (3) final approval of the version to be published. Finally, again, (4) all authors must agree to authorship. Authorship cannot be a gift or a surprise. If you are a single author, and you wrote the paper as a graduate student or post-doc, please let us know the name and contact info your then supervisor/mentor. (The place to thank people is in Acknowledgments.)

In case of any ethical or conflict of interest situations, MSA is guided by "The Code of Conduct and Best Practice Guidelines for Journal Editors" of the Committee on Publication Ethics (COPE). COPE website: <http://www.publicationethics.org/>.

- [COPE Ethical Guidelines for Peer Reviewers, English version](#)
- [COPE Ethical Guidelines for Peer Reviewers, Chinese version](#)

MANUSCRIPT FORMAT

Feature	Description
File type	Word .doc(x) or rich text format .rtf preferred* Express option: PDF (first round submission only, include line numbers#)
Line spacing	Double spaced throughout
Font	Times New Roman (or similar) 12-point type
Page size	US Letter (8.5 by 11 inches)
Page numbers	Yes
Line numbers	Not required (added automatically by the peer review system)

* Note: Although LaTeX or Tex files can be uploaded to the peer review system, accepted manuscripts **must be** provided as doc(x) or .rtf files. Likewise, WordPerfect format files are **not** permitted.

Express option: want to upload just one file? You can insert tables and figures at the end of the text in a .doc or .rtf file and thus upload just one Article File. **But if accepted** (or on revision), then each image must be supplied upon request as a proper high-resolution figure file. (A whole PDF could be uploaded as well, but unless you put line numbers on it, it will not have line numbers. Please do try to include line numbers.)

The parts of the manuscript should appear in this order:

1. Title
2. Authors and affiliations
3. Abstract and keywords
4. Body of paper with Implications section (required)
5. Acknowledgments, if desired
6. References cited list
7. List of figure captions
8. Appendix text (if any), Footnote, Deposit Items (text)
9. Tables
10. Figures

Titles should be concise, but descriptive and indicate the basic importance of the paper.

Author list: To facilitate web discoverability and protect authorship, it is generally recommended that authors spell out first names rather than use initials only-- unless for some reason you are known and established in the literature by your initials.

Affiliations: Please give complete addresses, including post codes. Add a footnote for authors who have moved (to give a Present address).

Abstract guidelines: Should be 250-800 words (max!); concise; capture broad interest; indicate why results are significant; indicate suitability to an international audience; include important numbers/ranges; followed by list of keywords. Cut and paste your full abstract on OSS. More information in that section below.

You want to entice people who skim abstracts to click on your paper. These are the basic components of a good abstract (adjust these to fit your paper):

- (1) Motivation/problem statement: Why do we care about the problem? What practical, scientific, theoretical or other gap is your research filling?
- (2) Methods/procedure/approach: What did you actually do to get your results?
- (3) Results/findings/product: As a result of completing the above procedure, what did you learn?
- (4) Conclusion/Implications: What are the larger implications of your findings, especially for the problem/gap identified in 1 above?

General text details:

- **Figures and tables** must be mentioned in numerical order in the text. Figure captions appear after references. (Table captions should remain with tables, not separated.)
- Use American (not British) spelling conventions.
- Be sure to use proper super- and subscripts, *not* raised or lowered type.
- Use boldface and italic fonts appropriately and *consistently*. In general, variables are italic; vectors are bold. Molar concentrations are plain M (not italic).
- Close up percent signs with terms, i.e., wt%, mol%, etc.
- Terms from "Latin" such as "et al." and "ab initio" are kept in Roman/plain style and not italic. The exception is biological species names.
- Spell out the units in the text if not accompanied by a unit. Example: several inches vs. 23 cm.
- A zero should precede the decimal point for values less than one, e.g., 0.25 rather than ".25". (Decimal points are periods, never commas.)
- Polytypes (letters) are italic (e.g., 2M1) but site labels are plain, e.g., M1, O(2).
- Note that "micro", "pseudo" and "multi" are not words by themselves, combine with words or hyphenate, e.g., microanalysis, pseudo-Voigt.
- Do not use the word "micron" in text, figures, or tables. Use micrometer or μm .
- Other abbreviations (plain type); cf. = compare; e.g., = for example; et al. = and others; etc. = and other things; i.e., = that is; p./pp. = page(s); vs. = versus.

Special characters/notations:

- Use the "Symbol" font for greek letters as much as possible. Note: Greek letters are already "special" and should not be further italicized.
- Do not use *handmade* characters such as lowercase, superscript "o" for the degree sign.
- DO use Equation Editor for display equations that are complicated; this is not necessary for small inline expressions, such as stacked characters or overbars. If X^0_i is your expression, we will know to stack it. Or you can say {note to typesetting} if you are concerned about notation at any point, for example {note to typesetting, these minus signs are overbars on top of the 1}.
- Many common notations are familiar to our staff, i.e., f_{O_2} (2 would be subscript to O) and overbars. When we aren't sure, we leave things as they appear on the submitted manuscript. Feel free to include notes to typesetting to help us out.

Equations:

- Use Word Equation Editor or MathType to create display equations.
- If you refer to an equation in the text, use display equations (set off from the text) and number them sequentially, like this "(1)". Simple equations can be typed by hand rather than using a special tool.
- Also use display equations when labels (such as mineral names) have to be lined up beneath formulas, with a note to typesetting if necessary.
- For equations that are *not* referred to by number, keep them in line with the text as much as possible.

Headings:

Only three orders of headings may be used. Note if subheadings are used, there must be at least two (e.g., two or more 2nd/3rd-order headings under a superior-order heading; a single 2nd/3rd-order heading by itself is not allowed). Descriptions follow and are also examples:

Main or first-order headings (centered, bold)

Second-order subheadings (on a line by itself, flush left, bold)

Text follows as normal.

Third-order subheadings (after a paragraph indention, bold, and followed by a bold period). Text follows in plain type.

Implications Section [the concluding paragraph(s) of a paper]:

Authors should follow their "Discussion" section, with a final section titled "Implications". This section should be forward-looking; it is intended to provide authors with the opportunity to place their results into a broader context. That context should highlight the importance of the work, and emphasize relevance to and beyond the sub-discipline. This section is not to be confused with a "Conclusions" section, which like the abstract only summarizes the paper (such sections will be cut, regardless of how they are titled). The Editors will look to the Implications section to help judge whether a paper should be highlighted, and to judge whether a paper is suitable for the journal. We also advise authors to report Implications within the Abstract.

Acknowledgments: The acknowledgments section should be brief but inclusive. Please double check grant numbers and spelling of personal and company names. Do not use titles, such as Dr.

GUIDELINES FOR REFERENCES

Overview: All citations in the text, figures, tables, and other supporting parts of the manuscript must be in the reference list and vice versa. References are a very important part of your paper. Please do your best to make them as complete and as compliant with our style as possible. Our goal is that when a reader sees Zhang et al. (2010b), they will know that in the reference cited list this will be in Z's for Zhang, then after 2010a -- it is very logical, very quick.

Submitting your manuscript with properly formatted references and correct in-text citations will speed up the editorial process. If they are a mess, your manuscript may be sent back for correction, even after acceptance. Likewise if our automated reference-checking program generates a large list of problems, then you will be asked to make corrections.

Quick tips-- What helps the Editorial office the most:

1. Complete information, such as publisher name, location, page numbers as appropriate, etc.
2. No abbreviations of journal titles, material source, etc.
3. Alphabetical order (chronological order for three or more authors; first author's last name, first initial is all that matters for order).
4. Note: there is no italic/bold in our style.
5. Do not use references from Wikipedia; these are not permitted.
6. Watch this quick two minute video on references: [Click here](#)
7. A paper still being written is called out in text: Smith et al. in preparation.
8. A paper still in peer review at a journal: Smith et al. in review. *(These are discouraged and if used should be explained in cover letter. Be prepared to provide material or further information. The best use of these is when you are pretty confident it will be "in press" when/if revisions are created, as a placeholder so to speak.)*
9. A paper accepted but not scheduled for an issue: Smith et al. 2015 (use year in text and "in press" as the page/volume part in the reference list).

Ordering References

There are 2 basic things to look for when putting references in order:

1. Last name of first author in the list -- first make the list alphabetical
2. Then where the last name is the same for multiple references, sort chronologically, keeping solo works together, then keeping doubleton works together, then multi-author works together:

Here are examples, in the correct format and order:

- Andreozzi, G.B. (2002)
- Andreozzi, G.B., and Lucchesi, S. (2002)
- Andreozzi, G.B., and Princivalle, F. (2002)
- Andreozzi, G.B., Princivalle, F., Skogby, H., and Della Giusta, A. (2000)
- Andreozzi, G.B., Lucchesi, S., Skogby, H., and Della Giusta, A. (2001)

Solo works first by same author: All the solo works by same author clump together, chronologically.

- Smith, J. (2000)
- Smith, J. (2001)

Doubletons (Duo) authors: All duos with same first author clump together after the solo works and before the multi-authors. Since there are two "Zhang" papers, they go in chronological order in the clump of doubleton's.

- Smith, J., and Brown, S. (2010)
- Smith, J., and Zhang, T. (2010)
- Smith, J., and Zhang, T. (2011)

Multi-authors are chronological, in their clump: Note that a and b are added to differentiate the two 2001 papers.

- Andreozzi, G.B., Princivalle, F., Skogby, H., and Della Giusta, A. (2000)
- Andreozzi, G.B., Lucchesi, S., Skogby, H., and Della Giusta, A. (2001a)
- Andreozzi, G.B., Lucchesi, S., Princivalle, F., and Della Giusta, A. (2001b)

Formatting

- All authors in the references must be listed by: last name, followed by initials (with a comma between, i.e., Jones, H.); *exception:* when citing an article from a volume with editors, the Editors (Eds.) are listed by initials first, i.e., In G. Washington, Ed., Book/Volume title.
- Journal names are fully spelled out. This is the most common and most tedious mistake to fix. It is most important that the reader be able to find the reference.
- Book titles follow "Initial Caps" format, e.g., The History of Rocks
- Journal titles and chapter titles, use "Sentence case," meaning capitalize the first word, proper nouns, etc., e.g., Eruptions of St. Mary's volcano through the ages; A study of Pb minerals.
- No spaces between initials (Jones, D.H.)
- Suffixes, such as Jr. and III, go *after* the initials, with a space (Bosworth, M.R. Jr.)
- Year in parentheses, with no colons, commas, or other punctuation e.g., (1998)
- No parts of the reference are italicized, boldface, or underlined, unless it is part of a title (rare).
- Issue numbers are only needed when the pages start at 1 for each issue, which is rare.
- Note references in languages other than English by adding: "(in Japanese)" as appropriate
- For articles *In press*: List the title, authors, journal name, DOI if you have it, and "in press," cite them as published works.
- In cases where the same author(s) have references from the same year, differentiate them in the list and citations by adding lowercase letters; e.g., Smith et al. 2000a, 200b; Donner 1965a, 1965b.
- In cases where sequential references have identical author lists are replaced by 3 m-dashes, e.g., two references by "Smith and Dymek", the second instance in the list would be replaced by 3 dashes so as to not repeat in the list. If you see this change on your proofs, don't worry! (And don't bother marking it...it is our style.)
- If there are significantly more than 10 authors, then after the 10th author put "and others."
- Doppelgangers: if the last name is the same but the authors are not the same individual, sort chronologically to aid the reader: i.e., Smith, J. (2010) comes after Smith, T. (1999).

Citation examples

- Solo works: Smith (2010)
- Duo works: Tennant and Smith (1998)
- 3+ authors, use "et al." (Smith et al. 1990)
- Semi-colon between citations with different authors (Smith et al. 1999; Jones 1929)
- Commas between citations with the same last name(s) (Conway and Dymek 1980, 1984) or Jones et al. (1988, 1994). Note: The two Jones may have completely different authors, it doesn't matter because the reader will be able to quickly find them both chronologically.
- Omit any reference from the list that is not published (including papers in review or preparation). Cite them in the text by last name followed by "personal communication", "in preparation" or "unpublished manuscript(data,etc.)." Year is optional in this case.

CSL style may help: We have a brand new listing in CitationStyles.org – if you keep your references in a citation database and apply styles depending on where you submit, in theory you should now be able to apply our style. (If you don't keep a citation database and have no idea what any of this means, don't worry about it.) Here are some links of possible information and help about CSL:

- Here is our style: <http://zotero.org/styles?q=American%20Mineralogist>
- Here is the style repository info: <http://citationstyles.org/styles/style-repository/>
- Here is a Zotero youtube info for authors: <http://www.youtube.com/watch?v=RtcvgL-XFDE>

- Here is a Zotero and Word youtube help: <http://www.youtube.com/watch?v=o8gaG59rr9M>
- From the CitationStyles library our style should gradually become available via any of those programs; but we can only promise Zotero.

Note about URLs: We do not recommend using URLs as they often change. It may be crucial that the reader sees what you saw on the date of access (instead of the updated info one or five or fifty years later) (if the link even still works). In the interest of preservation, if an URL is needed, then try using "WebCite" to create an archived version of the website. Cite it like this: (<http://www.webcitation.org/6MiPbLEbu>, accessed Feb. 10, 2012).

If you must use an URL in a reference, then include: title of site/material, host of site, date accessed the site, and anything else useful. Otherwise consider something such as a footnote or parentheses: (Smith et al. Database of Rocks, Univ. of Earth Database, accessed Aug. 8, 2012). The citing of databases is still a work in progress for best practices but please do give credit to the authors of the data. It has been also recommended that in addition to a link to the data itself, a reference to the article about the data is included.

Examples of Reference Types

Journal articles:

Jakobsen, H.J., Nielsen, N.C., and Lindgreen, H. (1995) Sequences of charged sheets in rectorite. *American Mineralogist*, 80, 247–252.

Journal articles (in press):

Jakobsen, H.J., Nielsen, N.C., and Lindgreen, H. (2015) Sequences of charged sheets in rectorite. *American Mineralogist*, in press.

Thesis/dissertation:

Hildreth, E.W. (1977) The magma chamber of the Bishop Tuff: Gradients in temperature, pressure and composition, 328 p. Ph.D. thesis, University of California, Berkeley.

General Books:

Smith, J. (1969) *The secret life of rebellious rocks*, 432 p. Wiley, New York.

Born, M., and Huang, J. (1954) *The Dynamical Theory of Crystal Lattices*, 420 p. Clarendon, Oxford.

Books in a series or with editors:

Smith, J., Ed. (1969) *Our Rock Group*, 2nd ed., 1002 p. Wiley, New York.

Doe, J. (1990) Phase transition in leucite. In E.K.H. Salje, Ed., *Phase Transition in Ferroelastic Crystals*, p. 330-334. Cambridge University Press, U.K.

Chapter in MSA's Reviews in Mineralogy and Geochemistry:

Finger, L.W., and Hazen, R.M. (2000) Systematics of high-pressure silicate structures. In R.M. Hazen and R.T. Downs, Eds., *High-Temperature and High-Pressure Crystal Chemistry*, 41, p. 123-156. *Reviews in Mineralogy and Geochemistry*, Mineralogical Society of America, Chantilly, Virginia.

Short form also acceptable: Finger, L.W., and Hazen, R.M. (2000) Systematics of high-pressure silicate structures. *Reviews in Mineralogy and Geochemistry*, 41, 123-156.

How to cite data or a database:

Ralchenko, Y., Kramida, A.E., Reader, J., and NIST ASD Team (2011) NIST Atomic Spectra Database (ver. 4.1.0) [Online]. Available: <http://physics.nist.gov/asd> [accessed 2012 February 15]. National Institute of Standards and Technology, Gaithersburg, Maryland.

Conference proceedings:

Smith, J. (1971) The truth of rocks in Florida. In B. Jones and C. Doe, Eds., Proceedings of the third conference on Florida rocks, p. 224-228. Mineralogical Society of Florida, Miami.

Non-English references:

Born, M., and Huang, J. (1954) The Dynamical Theory of Crystal Lattices, 420 p. Clarendon, Oxford (in Japanese).

Secondary reference:

Innocenti, M., Lattanzi, P., and Tanelli, G. (1984) Mineralogy and environment of formation of the Cu-Pb-Zn (Ag, Sb, As) mineralizations of the Niccioleta deposit. Rendiconti della Società Italiana di Mineralogia e Petrologia, 39, 657–667 (not seen; extracted from American Mineralogist, 71, 231, 1986).

Translation:

Nogarko, L.N. and Gulyayeva, L.A. (1965) Geochemistry of the halogens in alkalic rocks of the Lovozero massif (Kola peninsula). Geochemistry International, 2, 729–740 (translated from Geokhimiya, 8, 1011–1024, 1965).

GUIDE TO TABLES

First and most important, we must have your tables in an electronic (editable) format! Ideally that format is Microsoft Word or Excel, but we'll even take txt or ascii to keep re-keying to a minimum.

Note: If you use Word's "Table" feature or a spreadsheet with individual cells, do NOT enter an entire list of data into one cell. That will necessitate re-keying or re-supply when we go to layout.

Data should read from left to right, with one value per cell. The table submitted for review should be double spaced if it is short, but not if it is very long. A current issue of the journal will provide examples of approaches to complex tables.

Notes on formatting:

- Table titles should be brief.
- The column headings have any appropriate units (in parentheses).
- Any headings within the table that apply to a block of data should be bold and centered.
- Footnotes end with periods.
- No vertical or diagonal rules/lines may be used. No shading.
- Column headings must be upright, not turned sideways.
- Brackets to delineate groups of data may be used only if necessary; the groups should be clearly marked on the submitted document!
- Use white space in the body of the table to separate sections.
- A zero should precede the decimal point for values less than one, e.g., 0.25 rather than ".25". (Decimal points are periods, never commas.)
- Put any general notes before the first footnote symbol, preceded by "Note(s):"

Footnote symbols are used to explain or expand upon data in the table. Am Min style is to use **superscript lowercase letters** in alphabetical order, as follows (superscript) a,b,c,... They may be doubled and tripled as necessary, but that should be rare since you have 26 letters to start from!

GUIDE TO FIGURES

Figure preparation can be viewed as having two stages: (1) Peer Review and (2) Production (after acceptance).

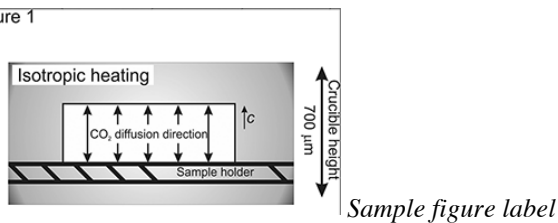
(1) Figure guidelines for Peer Review: In the web-based submission system, figures are uploaded for reviewers and editors. Most of the time they will be viewed solely on screen. Of course, be prepared to supply high-quality figures if accepted.

Where to upload	peer review website, along with your other files*
Acceptable file formats	tif, eps, jpg, pdf, doc (see below#) <i>(PowerPoint) PPT files are not preferred</i>
Labeling	Each figure should have the appropriate numerical label, e.g., Figure 1, Fig. 2, Figure 3a... somewhere on it (such as above, below, lower corner, etc.) See below example.
Resolution	web quality OK* for submission/peer review
File names	entered onto the tabbed files screen (for metadata), simply Figure 1, etc.

* Note, when uploading very large files, conversion to PDF might take a while. There is no need to contact our office unless conversion has not completed after 12 hours.

Word (doc) accepted for peer review; figures only or at end of manuscript.

Figure 1



(2) Figure guidelines for Production: When your paper is accepted and goes to Production, then we evaluate the artwork submitted to the online system. High-quality figures are needed for production. If problems arise, we will work with authors to get press-quality images.

Where to upload/send files	If we have any problems with your submitted files, the Editorial Office will contact you.
Acceptable file formats*	tif, eps, pdf
Word(doc) accepted	No, not at production for optimal quality.
Resolution (ppi/dpi)	see guide below
File names	Always put ms tracking number first and last name e.g., 1234SmithFig2.tif

* Fonts must be embedded.

New requirement: Each figure should have the appropriate numerical label, e.g., Figure 1, Fig. 2, Figure 3a, etc. somewhere on image itself (such as above, below, lower corner, etc.).

Copyright Permissions:

All figures (tables, video, anything) requiring permission ought to have its copyright information acknowledged in the caption of that figure/table (even if the permission granted is pending this step). Use the following format: [Used by permission of Publishing Company, from Rambo and Pinko (20XX), Journal, vol. x, Fig. Y, p. z.].

A copy of the copyright permission letter is due to the Editorial office as soon as your paper is accepted (or as soon the letter is obtained). Failure to send us this letter will delay publication of your article. You will receive an email after acceptance with instructions on how to fill out the required paperwork; but do not delay in obtaining your copyright permissions once your paper is accepted.

Note: You need a letter of permission even if it is a photograph taken by a friend (unless s/he is a coauthor). Also, images from the Web, including Google and Wikipedia, cannot be used.

Resolution 101

General size guidelines: Assume most art will be 1 column in layout, which is approx. 3 inches (19 picas)-- 2 column art can go up to 6.5 inches (39 picas). Do not use hairlines (make lines >0.5 pt thick). The smallest character or symbol on a figure should be 8 pt high to ensure readability. Use a sans serif font (like Helvetica) and be consistent. **Remember to "embed" all fonts!**

Note that there are 3 types of figures: plain line art, photographs, and combination art (a mixture of photographic and line art elements). **Tip:** Here is an easy way to test your resolution: view your artwork on a computer screen at 400% enlargement, are lines jagged? fuzzy? acceptable?

Ideal resolutions for Raster art (.tif): 1200 ppi/dpi for line art; 300 to 600 ppi/dpi for grayscale (shaded) art; 300 ppi/dpi for grayscale-photographic or color artwork. While PDFs and .eps artwork are vector (meaning they expand/contract and keep their set resolution), they will still have too low a resolution if low-resolution raster images are embedded inside.

Color artwork: Should be CMYK (not RGB); if it is not color, make sure it is grayscale, not RGB or CMYK. Visit <http://www.minsocam.org/msa/AmMin/Finacial.html> for information about color fees.

TEM artwork needs special care because of the fine detail and repeating patterns that are difficult to capture on paper with ink in printing. Please use high-resolution images. If accepted, the proofs should be a guideline as to what authors will see and you can re-supply at that point if need be.

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Figure captions

Figure captions should be brief and explanatory; they should not duplicate information in the figure. Place extensive descriptive text in the caption, not in the figure. Follow this format:

Figure 1. Description text here.

Multiple parts of figures should be indicated by lowercase letters “a” and “b”. In the caption, make **(a)**, **(b)**, etc. in bold, or use **(left/right)** or **(upper/lower)**. If letter designations are used for the parts, please label the figures with those letters.

Labels and text in the figures must be consistent with the manuscript *and* follow Am Min style. Please note our abbreviation style; especially wt% for weight percent, *T* for temperature, and *P* for pressure.

Fees for Color artwork

Authors are responsible for the cost to print color in the journal. We strive to keep our fees low (see details [here](#)). A very limited color fund is available for financial assistance. But first consider other options outlined on our [web site](#). Alternately prepare your figures to run in grayscale. We make no profit on color and charge the author only the average cost to us.

Interactive Figures

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Using GIMP to modify or clean up your figures

Gimp is a free, open-source program comparable to Photoshop. You can download the free software from <http://www.gimp.org/downloads/>. This software will allow you to modify your figures to correct spelling, adjust symbols, or anything you might need to change your figures, scale them to a different size, and save them in one of our acceptable format: tif, eps, jpg, pdf, doc. Here is a [video](#) that gives you a quick tutorial on how it works.

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Supplementary material will be placed in MSA's free to use, free to read depository, which is located [online](#) (click on any Table of Contents, look for a deposit item and click the link). Here's an [example](#) of our data page. Starting in 2016, deposit links are located next to the issue in the TOC grid.

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Submission Requirements

An electronic copy of deposit/supplementary materials, figures, tables, CIFs, additional methods information, and even movies should be uploaded to the peer review system when you submit your paper. Contact the Editorial office regarding any questions or concerns about special format files or for transmitting the files by ftp.

In most cases, the Editorial office will add the "branding" needed to identify the published version of your article. However, it is very helpful and a "best practice" for authors to put at the top of the file last name, year of publication, and *American Mineralogist*. Authors with many deposits will be asked to do this in the production phase if they have not.

CIFs: These data have specific requirements and are vetted in peer review. See CIF guidelines.

Supplemental Data Sets

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Resources

Not in any priority order, a list that will likely grow over time of "data resources". Contact us with any suggestions.

- Dryad: datadryad.org
- Figshare: figshare.com
- [Data Management Short Course for Scientists](#), hosted by The ESIP Federation
- Registry of Research Data Repositories: re3data.org
- [Center for Open Science](#)
- American Mineralogist [Crystal Structure database](#)
- COD (Crystallography Open Database): www.crystallography.net
- IUCR: www.iucr.org/resources/data/datasets
- System for Earth Sample Registration: www.geosamples.org
- Library of Experimental Phase Relations (LEPR): lepr.ofm-research.org/YUI/access_user/login.php
- pMELTS Database: melts.ofm-research.org/Database/php/index.php
- [DataCite](#)
- [DataONE](#)

CRYSTALLOGRAPHIC DATA (CIF) INFO FOR *AMERICAN MINERALOGIST*

Introduction

The CIF (crystallographic information file) format is the *de facto* standard for communicating all sorts of crystallographic information. In particular it is used to archive crystal structure data, combined with experimental and refinement details.

Manuscripts reporting results of crystal structure refinements must be accompanied by a CIF providing the structural data. To ensure quality and integrity of the crystallographic data, the submitted CIF will be reviewed by the Am Min technical editing team. After publication of the manuscript, the CIFs will be made available as supplementary material on the Am Min webpages. They may also be deposited into databases, such as the AMCSD (American Mineralogist Crystal Structure Database) and the COD (Crystallography Open Database).

Submission Guidelines

Only **one** CIF should be submitted with a manuscript. If more than one structure refinement is reported in a manuscript, each structure refinement must be a separate data block in the CIF. Do not compress or otherwise modify the CIF for submission. The filename extension must be '.cif'.

Detailed information about CIF requirements for manuscripts submitted to American Mineralogist, help and advice, are in the [AmMinCifGuide.pdf](#).

Minimum CIF Requirements

The minimum requirements for a CIF submitted to American Mineralogist are, in brief:

1. It must conform to the CIF syntax as defined by the ([IUCr](#)).
2. It must contain appropriate information about composition, mineral name, and locality/source.
3. It must contain the unit cell parameters, symmetry information and space group, the fractional coordinates and displacement parameters of the atoms.
4. The experimental conditions (temperature, pressure) and basic information about the experiment (radiation, diffraction measurement type) must be reported.
5. The reported data must be physically-reasonable and crystallographically consistent.
6. It must contain all structures reported in the manuscript. Only one CIF is to be submitted per manuscript.

An example of a CIF meeting these minimal requirements can be downloaded from ([here](#)).

Additional Information Policy

Authors often decide to include more information into the CIF than the "minimal requirements". We strongly encourage authors to include as much information as possible; the more information that you include in the CIF, the more valuable the data is to other researchers, and the higher the likelihood that your results will be used and cited by others! Please make sure that all of the data is consistent with the manuscript (distances/angles, refinement details, etc.). If structure factors are submitted, they have to be formatted using the CIF syntax and to be included in the CIF to make sure they can easily be used by other authors.

Creating A CIF

Most modern diffractometer control software packages, data reduction software, and structure refinement programs will produce a CIF for you. They will also produce data tables from the CIF. You are strongly recommended to use these facilities to avoid any manual editing of crystallographic data, and thus avoid inevitable "cut and paste" errors. The recommended sequence of tasks for producing a CIF is:

1. Perform data collection and reduction, and then structure refinement.
2. Collate the CIF fragments produced in each step to one cif for one structure.
3. Validate the CIF at the IUCr (<http://journals.iucr.org/services/cif/checking/checkbasic.html>)
4. If more than one structure refinement is being reported, join the individual cifs together in to a master CIF, and lock it against any editing.
5. Create the data tables and figures for the manuscript from the data in the master CIF.
6. Submit the manuscript and the CIF.

Quality Checklist

- (1) The cif is free of syntax errors/warnings from encifer (more info about encifer available at the link above)
- (2) All the data are correct and correspond to the tables in manuscript
- (3) The chemical composition is correct; the formula_sum matches the refined structure (site occupancies)
- (4) There are no significant warnings given by checkcif
- (5) I understand that the TETeam will laugh at me and happily reject the cif if it does not match the requirements.

CIF Resources

- American Mineralogist CIF guide: [AmMinCifGuide.pdf](#) and example: [here](#)
- IUCr cif resources: <http://www.iucr.org/resources/cif>
- IUCr Cif Guide for authors: <http://journals.iucr.org/b/services/cifguide.html>
- IUCr online cif checker: <http://journals.iucr.org/services/cif/checking/checkbasic.html>
- Encipher program to edit cifs: <http://www.ccdc.cam.ac.uk/Solutions/FreeSoftware/Pages/EnCIFer.aspx>
- publCIF for checking CIFs and producing tables: <http://journals.iucr.org/services/cif/publCIF>
- Program to remove illegal characters from a CIF: www.rossangel.com
- Program to tabulate data from multiple data blocks in one cif (for example from variable P or T studies) www.rossangel.com

LIST OF NECESSARY ITEMS FOR EXPERIMENTAL DOCUMENTATION

(Modified from Table 3.2.1 in the book *Basalt Volcanism on Terrestrial Planets*)

Most or all of the following can be placed into an electronic appendix, but must be made available to reviewers and the AE for review purposes.

1. Goal of the experiments
2. Documentation of starting materials
 - natural or synthetic
 - preparation procedures (oxide mix or gel, grinding methods, temperature, oxygen fugacity, etc. of preparation)
 - state (crystalline, glassy, gel)
 - mineralogy if crystalline
 - grain size and grain size distribution
 - composition after preparation and before use
3. Experimental apparatus
4. Thermocouple type, calibration and uncertainties
5. Pressure measurement method, calibration and uncertainties
6. Methods of temperature and pressure controlled
7. Oxygen fugacity (controlled or uncontrolled, method of measurement and error)
8. Method of addition of volatiles and uncertainty
9. Sample container
 - material(s)
 - open or sealed capsule
10. Pressure-temperature path during the experiments (heating and cooling rates and time at each temperature and pressure)
11. Quenching method and rate to reach a specified temperature
12. Special treatment, if any, during opening of the experimental capsule (e.g., freezing of a volatile phase)
13. Evaluation of attainment of equilibrium for phase equilibrium experiments
14. Demonstration of reproducibility and/or consistency for kinetic experiments
15. Phase composition data in Excel or other spreadsheet format; could be made ready for incorporation into the database Library of Experimental Phase Relations (LEPR; <http://lepr.ofm-research.org/>; Hirschmann et al. 2008, G3, vol. 9, DOI: 10.1029/2007GC001894).

ADDITIONAL INFO

Estimated Standard Deviation

Precision of measurement may be indicated as 1.781 ± 0.002 , if 0.002 represents a subjective estimate of the measurement error. Where sufficient data permit calculation of the estimated standard deviation (e.s.d.), indicate it with parentheses e.g., 1.781(2) and 1.781(11) indicate an e.s.d. of 0.002 and 0.011, respectively. Only significant digits shall be given for the observed value, i.e., e.s.d. values in parentheses should be given as single or double digit integers. *American Mineralogist* as a policy requests that all measured values have to be accompanied by some indication on the uncertainty. Ideally this should be a properly calculated standard uncertainty. Only in exceptional cases, if scarcity of sample or some other special circumstances prohibit any even subjective estimation of an uncertainty, can this rule be waived.

Standards for Mineral Names, Nomenclature, and Abbreviations

Mineral names and abbreviations: Use a consistent set of mineral abbreviations throughout text, tables, and figures. Abbreviations are recommended for subscripts, superscripts, reactions, assemblages (connected with plus signs), and normative mineral symbols with subscript weight percentages; however, abbreviations should not be used for mineral names that stand alone in the text. Whitney and Evans ([10.2138/am.2010.3371](#) v. 95 no. 1 p. 185-187) has recently suggested a set of abbreviations that may be used. However, you may choose another **consistent** set.

Mineral nomenclature: New mineral names and redefinitions of existing names must be approved by the Commission on New Minerals Nomenclature and Classification (CNMNC) of the International Mineralogical Association (IMA) (Fleischer 1970) before publication. For this purpose, consult the [published reports of the Commission on New Minerals Nomenclature and Classification \(CNMNC\)](#) of the International Mineralogical Association (IMA). The MSA website hosts many of the [IMA Reports](#).

*A Special Note About Nomenclature: Remember it is the author's responsibility to make sure the text, tables and other materials **consistently** follow the nomenclature recommended by the IMA. Reports detailing the CMNNC approved style for nomenclature for minerals and mineral groups are available.*

New mineral names: Authors must provide the Editorial Office with evidence of IMA approval of any new mineral names. Whenever naming new minerals, authors must conform to the rules and principles set forth in Nickel and Mandarino (1987) [\[download excerpt, pdf\]](#) or Nickel and Grice (1998) [\[download, pdf\]](#). The paper by the Commission on New Minerals and Mineral Names (1982) should be consulted for a suggested outline for new mineral descriptions. The abstract of a new mineral description should completely list the properties of the mineral in a manner consistent with the "New Mineral Names" section of the journal. The paper by Nickel and Grice (1998) [\[download, pdf\]](#) gives more information on procedures. Additional information is given by Dunn (1977). Naming of regular interstratifications of clay minerals is discussed by Bailey (1982). In general, manuscripts proposing new names for imperfectly or incompletely described minerals cannot be accepted.

Obsolete, discredited, or superfluous mineral names may not be used. A helpful guide is *Glossary of Mineral Species* (Fleischer and Mandarino 1995). This glossary is taken as the standard for the spelling of mineral names. However, the editors now allow use of element symbols as prefixes to the approved name of a mineral (e.g., Mg-chlorite, K-feldspar). A list of discredited mineral names and examples of acceptable and unacceptable usages of mineral names appear in Nickel and Mandarino (1987) [\[download excerpt, pdf\]](#) and Nickel and Grice (1998) [\[download, pdf\]](#).

Meteorite nomenclature: New meteorite names must be approved by the Nomenclature Committee of the Meteoritical Society [British Museum (Natural History), London, U.K.]. Other meteorite names must conform to the spelling given in the *Catalogue of Meteorites* (<http://www.nhm.ac.uk/research-curation/research/projects/metcat/>) or in subsequent numbers of the *Meteoritical Bulletin* (published in *Meteoritics*).

QUICK GUIDE TO UNITS AND SYMBOLS**Length (*l*)**

m = meter(s)

cm = centimeter(s) (1 cm = 10^{-2} m)

mm = millimeter(s) (1 mm = 10^{-3} m)

μm = micrometer(s) (1 μm = 10^{-6} m) NOT micron or μ

nm = nanometer(s) (1 nm = 10^{-9} m)

\AA = angstrom(s) (1 \AA = 10^{-10} m)

pm = picometer(s) (1 pm = 10^{-12} m)

Volume (*V*)

L = liter(s); mL = milliliter(s)

cm^3 = cubic centimeter(s)

\AA^3 = cubic angstrom(s)

Mass (*m*)

g = gram(s)

kg = kilogram(s)

mg = milligram(s)

μg = microgram(s)

Density (*D* or ρ)

g/cm^3 = gram(s) per cubic centimeter (please do not use Mg/m^3)

Concentration (indicate with square brackets [] around chemical symbol, e.g., $[\text{Cl}^1^-]$)

% = percent; ‰ = per mill

wt% = weight percent; mol% = mole percent; vol% = volume percent

M = molar concentration (1 *M* = 1 mol/L)

m = molal concentration (1 *m* = 1 mol/kg)

ppm = parts per million; ppb = parts per billion

Time (*t*)

s = second(s); min = minute(s); h = hour(s)

Note: day(s), week(s), year(s) spelled out

Ma = million years; Ga = billion years (ago or date)

m.y. = million years; b.y. = billion years (duration)

Pressure (*P*)

Pa = pascal(s)

kPa = kilopascal(s); MPa = megapascal(s)

GPa = gigapascal(s)

bar or bars (no abbreviation)

kbar = kilobar(s)

atm = atmosphere(s) (not recommended)

Temperature (*T*)

K = Kelvin(s); °C = degrees Celsius

Frequency (*f* or η)

Hz = hertz; kHz = kilohertz; MHz = megahertz

Energy

J = joule(s); kJ = kilojoule(s) (preferred)

cal = calorie(s); kcal = kilocalorie(s)

Miller indices-- note that letter symbols are italicized but numeric values are not, e.g., *[hkl]* but [100]

hkl = diffraction symbol

(*hkl*) = face symbol

{*hkl*} = form symbol

[*hkl*] = edge or zone symbol

Unit-cell measurements

a, b, c = edge lengths; α, β, γ = angles

a, b, c = vectors-- note boldface

Optical measurements:

- dispersion (r, v),
- optic axial angle ($2V, 2V_x, 2V_z$);
- principal vibration directions ($E, O; X, Y, Z$);
- refractive indices ($n; n_\epsilon, n_\omega, n_\alpha, n_\beta, n_\gamma$ where the n's are italic and the Greek characters are subscripts)

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Revisions, if and when requested, will also be uploaded via the online web-submission system by using the Replace tab and replacing old files with revised ones. Note that all revisions have the original manuscript number followed by an "R". All the old files will be available for the editors should any reason arise. Do not keep old files on the revision page. If another revision is requested, that upload will be R1 and so on (a rare situation). Note there is a checklist for submitting revised manuscripts attached.

Timeframes for Am Min

In general, an editor is assigned and an associate editor invited to handle the paper within a few days of submission. Within about five days, depending on the time of year, an associate editor has been found. Our goal is for associate editors to find reviewers in a couple weeks for overall review time to be about six weeks. However, as everyone knows, it can be challenging finding reviewers. Our goal is between three and four months revision info should be with authors (unless there are complex circumstances or other considerations, of course). The most important factor to having a speedy submission-to-publication experience is for the *author* to handle the revision instructions very promptly. We remind the author at 60 days and again at 120 days and then, unless there are special circumstances, it is considered withdrawn. Resubmissions are encouraged when the time becomes available. In general, once the revision is in, the AE may request further review, another revision, a discussion or make a recommendation to the editor. If accepted, production of the paper tends to take about three months. Our average submission-to-publication time currently is under 10 months; many papers are faster. These timelines should guide you as to when to contact the associate editor or the editorial office for information on your paper, in a gentle fashion and understanding that all the editors are volunteers.

Please go to our [online submission site](#) and submit over the web, which has complete instructions and help files.

Here are quick [instructions](#) in PDF format.

Contact us with your questions at peer_review@minsocam.org.

Nonnative English speakers

Authors for whom English is not a native language must have their manuscript reviewed by a colleague who is fluent in English before submitting it to American Mineralogist. Manuscripts that require extensive editing for grammar and spelling will be summarily rejected.

NEW PAPER CHECKLIST

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- Choose the correct paper type (Regular for most articles), special section if applicable
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- Include reference to deposit material, including CIF, in the text.
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- For references with the same first author last name (initials do not matter in this case), sort alphabetically for 2 authors (Smith and Jones, followed by Smith and Mars). Sort single authors and 3+ authors chronologically (Smith 1999, 2000; Hess et al. 2007, 2013).

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Electronic Forms and Formats

- The current revision number **must** be at the top of your article file, Revision 1, etc.
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- We **strongly** suggest that you *include Tables at the end* of your manuscript (in the doc file); this will greatly simplify the production process
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- If needed, your paper has *one* complete CIF. Info here:
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- Upload high-quality figures, fit for print, more information below.

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- Use no italic or bold fonts unless it is part of the source title
- Order is alphabetical for entire list
- For references with the same first author last name (initials do not matter in this case), sort alphabetically for 2 authors (Smith and Jones, followed by Smith and Mars). Sort single authors and 3+ authors chronologically (Smith 1999, 2000; Hess et al. 2007, 2013).
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