

INSTRUCTIONS TO AUTHORS

Revised January, 1976

The American Mineralogist is established by the Mineralogical Society of America to publish the results of original scientific research in the general fields of mineralogy, crystallography, and petrology, including such areas as: descriptive mineralogy and properties of minerals, experimental mineralogy and petrology, geochemistry, isotope mineralogy, mineralogical apparatus and techniques, mineral occurrences and deposits, paragenesis, petrography and petrogenesis, and topographical mineralogy.

General requirements

1. Manuscripts including illustrations must be submitted in duplicate to the Editor, Brian Mason, *The American Mineralogist*, Department of Mineral Sciences, Smithsonian Institution, Washington, D. C. 20560. They must be typewritten, double-spaced (including references, figure captions, and all footnotes, except those to tables), with wide margins, on white paper about $8\frac{1}{2} \times 11$ inches in size; one side only of standard-weight paper must be used for the first copy. Xerox or other clear photocopy is satisfactory for the second copy. Footnotes should be typed at the bottom of the page, and should be numbered in sequence.

2. Only articles not previously published and not about to be published, wholly or in part, in either U.S. or foreign journals, will be considered. Authors should submit a statement affirming this requirement or explaining any overlap with previous or impending publication.

3. New mineral names, before publication, must be approved by the Commission on New Mineral Names of the International Mineralogical Association (Fleischer, 1970). For this purpose a copy of the manuscript should be simultaneously (or previously) sent to Dr. Akira Kato, Chairman, Commission of New Minerals and Mineral Names, National Science Museum, 3-23-1, Hyakunin-cho, Shinjuku, Tokyo 160, Japan. In general, manuscripts proposing new names for imperfectly or incompletely described minerals or new names for mere compositional varieties cannot be accepted. Writers naming new minerals should conform to the rules and principles set forth in Palache, Berman, and Frondel (1944, pp. 42-47) and Hey *et al.* (1961). The suggestions of Donnay and Fleischer (1970) for the description of new minerals are recommended.

4. For crystallographic data, the recommendations of the Commission on Crystallographic Data, International Union of Crystallography (Kennard *et al.*, 1967), and of the NAS-NRC Committee on Chemical Crystallography are standard in this journal; copies are available from the Editor of *The American Mineralogist*. X-ray powder diffraction data (d or 2θ) may be tabulated if necessary to characterize the mineral. They may be illustrated only if essential features cannot be tabulated. If the data are similar to some already published or listed in the Powder Diffraction File, then a statement to that effect is usually sufficient without republishing either a table or a cut. Refinements to previously available powder data can be contributed directly to the PDF without publication.¹ Powder patterns should be indexed, if at all

possible, and cell parameters listed; if this is not possible, the reasons should be stated. If the space group is known or determined, a powder pattern whose extinctions are inconsistent with the space group should not be published without explanation of the inconsistent extinctions.

5. For thermal analysis data, the recommendations of a Committee on Standardization of the International Conference on Thermal Analysis (McAdie, 1967) are standard for this journal; copies are available from the Editor.

6. Manuscripts that will print as 2 pages or less may be published as Mineralogical Notes, on the same schedule as major papers. As an aid to abstracting journals, a brief abstract is required.

Reprints

Authors who pay page charges will be furnished 100 free reprints without covers, as will authors of Memorials and of speeches at Society functions. On the form accompanying the galley proof, the author should indicate the total number of reprints desired, consolidating the orders from all co-authors and including the free reprints. This form should be sent to the Business Office of the Mineralogical Society at the same time that proof is returned to the Editor. The MSA Business Office will bill later; any purchase order forms required by the author's institution may be sent later to the Business Office of The Mineralogical Society of America, Suite 1000 lower level, 1909 K Street, N. W., Washington, D. C. 20006.

Page charges

Part of the publication cost will be billed, at the rate of \$35 per published page, to the institution sponsoring the research. A form will be sent with the galley proof, for the author to indicate where page charges are to be billed. A bill will not be sent if the author indicates that his sponsoring institution is unable to pay, but the name of the institution sponsoring the research should still be given on the form. Payment of page charges is *not* a condition for acceptance or for publication.

¹ Address Editor, Powder Diffraction File, Mary E. Mrose, U.S. Geological Survey, 959 National Center, Reston, Virginia 22092. Standard forms for reporting the data may be obtained from Mr. W. F. McClune, Joint Committee on Powder Diffraction Standards, 1601 Park Lane, Swarthmore, Pennsylvania 19081.

Title and abstract

7. The increased application of computer systems for information retrieval requires that both title and abstract be as informative as possible, consistent with their respective lengths. Where feasible in the *title*, words should be substituted for chemical formulas, Greek letters, or other odd typography.

To facilitate identification in indexing and abstracting, it is recommended that authors spell out one of their given names rather than precede their surnames with initials only.

8. The abstract should state concisely, in 250 words or less, what was done and what was concluded; if possible, it should include important numbers (*e.g.*, temperature range, main X-ray lines, chemical composition). The UNESCO guides for the preparation of scientific papers and abstracts (American Institute of Physics, 1968) are recommended; copies are available from the Editor.

Style

9. In general, style follows the American Institute of Physics Style Manual, or where particularly pertinent, those of the U.S. Geological Survey, the American Chemical Society, the Conference of Biological Editors, or O'Connor and Woodford (1975). The text must be written concisely; a telegraphic style will be suitable for some data presentations. It is recommended that a writer not conversant with English get help from an English-speaking colleague before submitting his manuscript for consideration by *The American Mineralogist*. Verbose or ungrammatical manuscripts will be returned.

10. Use consistent Systeme International (SI) units of the Metric System, with appropriate prefixes, italicize (by underlining in manuscript) symbols for physical quantities; use abbreviations without periods for units unless ambiguous (see Table 1). Where 0, O, 1, l, Greek letters, or other typography is possibly ambiguous in the text, instruct the printer by writing in the margin: "zero", "oh", "el", "one", *etc.* A table of special symbols available at our press may be obtained from the Editor. Complicated subscripts and superscripts should be avoided; parenthetical designations can often be used, *e.g.*, $d(\text{calc})$, $G(\text{O}_2)$.

Precision of measurement may be indicated as 1.782 ± 0.002 , if 0.002 represents a subjective estimate of the measurement error. Where sufficient data permit calculation of the estimated standard deviation (*esd*), indicate it as 7.3012 *esd* 0.0002. To save space in tables, the shortened form 7.3012(2) or 7.3012(11) respectively indicates *esd*'s of 0.0002 or 0.0011. A footnote to the table should then explain that "parenthesized figures represent the estimated standard deviation (*esd*) in terms of least units cited for the value to their immediate left, thus 7.3012(11) indicates an *esd* of 0.0011."

For acceptable symbols and abbreviations, see Table 1.

Use of headings

Heads. When set in type, an article is more attractive and easier to read if it is divided into major sections which are

TABLE 1. Abbreviations and Symbols Commonly Used in *The American Mineralogist**

Original typed width = 108 elite spaces = 9 in.			
Physical Quantities			
<u>P</u> ressure bar = kbar = kilobars atm = atmosphere	<u>V</u> olume ml = milliliters \AA^3	<u>I</u> ntensity I/I_0 = relative intensity <u>d</u> = interplanar spacing <u>hkl</u> = diffraction index (<u>hkl</u>) = Miller index { <u>hkl</u> } = form [<u>uvw</u>] = line or zone { <u>[uvw]</u> } = set of symmetry equivalent lines <u>MoKα_1</u> = radiation type	refr. ind. = refractive indices, or <u>n</u> , ϵ , ω , α , β , γ principal vibrations: <u>E</u> , <u>O</u> , <u>X</u> , <u>Y</u> , <u>Z</u> optic axial angle: $2V_x$, $2V_y$, or $2V_z$ <u>r</u> <u>v</u> = dispersion extinction angle: <u>ZΔc</u> or <u>Z:c</u> perpendicular to = \perp parallel to = \parallel
<u>T</u> emperature cal = calories kcal = kilocalories K = degrees Kelvin $^{\circ}\text{C}$ = degrees Celsius	<u>t</u> ime sec. = seconds m.y. = million years <u>f</u> requency (or ν) g = gram; kg = kilogram μg = microgram ρ = density ppm = parts per million pH sp gr or G = specific gravity	<u>l</u> ength in. = inches m = meter; cm = 10^{-2}m mm = 10^{-3}m ; μm = 10^{-6}m nm = 10^{-9}m \AA = Angstrom	
Other Abbreviations			
p. = page or pages <u>ca.</u> = circa <u>calc</u> = calculated	<u>et al.</u> = <u>et alii</u> = and others <u>etc.</u> = and other things	<u>i.e.</u> = that is <u>e.g.</u> = for example	meas = measured obs = observed <u>vs.</u> = versus

* The table title should be typed and should be the only material above the table itself. Other explanatory information can be placed as a footnote at the conclusion of the table, as done here. Instead of using letters or Arabic numerals, indicate footnotes by symbols such as *, **, ***, †, ††.

In this table the underlined portions of words indicate their standard abbreviations, and this underlining also instructs the printer to set the underlined material in italics. All the abbreviations underlined above should be underlined in your manuscript, as they are customarily set in italics in print.

† The wavy underlining calls for use of bold face type and is customarily used for vector quantities.

distinguished by first order headings. These first order heads should show the basic organization of the paper, and might be, for example: **Introduction; Previous work; Methods: Results; Discussion; Conclusions and implications; Acknowledgments; References.** For a mineral-centered article they might be: **Introduction; Occurrence and associations; X-ray crystallography; Chemical composition; Physical and optical properties; Thermal study; Discussion; Conclusions; Acknowledgments; References.**

Subheads, or second order heads. A major section of a paper may itself be divided into subsections, each distinguished by a subhead. For example, if some of the previously cited major sections in the paper on a mineral seem too brief, they may be grouped together as second order heads under a single first order head. Thus, under the first order head **Results**, there might be grouped the subheads: *X-ray crystallography; Chemical composition; Physical and optical properties.* The previous heading, "Use of headings" represents style of a second order head.

Third order heads. The three paragraphs of this subsection on heads begin with "third order heads," which may be used when a further subdivision is needed. If, in the previous example, two or more minerals are being studied, under the second order heads, e.g. *Physical and optical properties*, the specific mineral names might be used as third order heads.

Tables

11. Tables should be submitted as camera-ready copy, which can be photographed and included in your article without being set in type. To avoid undue delays or the necessity of retyping, use an **electric typewriter** with a **carbon ribbon**, and type each table on a separate sheet of white paper. We recommend an IBM Selectric typewriter equipped with a Prestige Elite 72 (IBM 012) or an Adjutant (IBM 030) ball. Footnotes to the table may be typed with a Courier Italic ball; they should be single spaced and their first line should be indented. White correction fluid as well as light blue guide lines, which will not photograph, are permissible. The camera-ready set of tables (in its own separate envelope) should be accompanied by two xerox (or other type) copies for use by reviewers. Assuming a typewriter with elite type—or any other 12 pitch typewriter which types 12 characters per inch—table widths should be approximately (A) 5 to 5½ inches or ~60–70 characters wide (for reduction to a single column); (B) 10 to 11½ inches or 120–140 characters wide (for reduction to a double column); or (C) ~15 inches or ~180 characters wide (for a broadside or sideways table). We are aiming for a photoreduction to *no less than 65 percent* of the typed original's size. Maximum lengths, including all footnotes, should be 15 inches for (A) and (B), which generally equals 90 single-spaced type-written lines. Tables of type (C), which are broadside or side-turn tables, must be no less than 10 and no more than 12–13 inches long.

Number the tables consecutively with Arabic numerals. About 3 mm above the column heads, use a smoothly writing black ball-point pen to rule a double horizontal line,² the spacing between these two lines being about 2

mm. Immediately below the double line, type the individual column headings, capitalizing only the first letter of their first word. **Draw** a single horizontal line to separate the column heads from the data to follow below them.² The material in the body of the table should be single-spaced, or, if the presence of subscripts or superscripts prevents this, it may be double spaced (or 1½ spaced if your typewriter has a ½ space ratchet). After every four or five lines of data within the single-spaced body of the table—or as the material demands to block together like with like—skip a line, to aid the eye to follow horizontally along a given line. Below the final data in the table draw a single horizontal line² to signify termination of the table. If the table continues onto a following page or column, reserve this line so as to draw it only below the last line of data. Below this final line of the table, type (single-spaced) all footnotes and general references; do not include such material in the table's title. For a lengthy table running several pages, the footnotes might better appear below the point where called for (or at the bottom of the first page of typing) rather than at the very end of the table. A concluding horizontal line should appear below the last footnote.

All titles for tables should be listed on a separate sheet, double-spaced (as are figure captions), to facilitate type-setting.

See the following pages of *The American Mineralogist*, Volume 58, for examples of tables to guide authors: (1) interatomic distances and bond angles, Table 7, page 419; (2) thermal ellipsoid data, Table 3, page 415; (3) structure factors, Table 2, page 414, this table being capable of accommodating two additional columns of data; (4) X-ray powder data, Table 1, page 718. Note the judicious use of single and double spacing to block data together and guide the eye in these tables and on pages 610, 616, 643, 644.

12. Data likely to interest only a few readers (e.g., individual hydrothermal runs, observed and calculated structure amplitudes, multiple chemical analyses, or supporting raw data) should be organized into tables with closely spaced columns. In the case of clear, computer-printed copy, if the data is extensive, no individual page of the table should exceed (*ca*) 20 inches wide by 26 inches long. If only a few such pages are involved, the Editor will have such tables printed at one third size along with the article (see vol. 59, (1974), p. 552, 845). The article will thus be complete even though a reading (magnifying) glass will usually be needed to read the data of these highly reduced tables. If such organization of the data will make up into more than 3 such pages, the data should be left in regular-size (8½ × 11 or 11 × 14) page form. The Editor may ask for such extensive tables to be deposited in the newly-established permanent file in the business office. Even in such a case, the print must be clear and legible throughout so that it will make readable microfiche. Microfiche of the tables will be sent to any reader, upon request, for a nominal fee. Such tables should be referred to in the manuscript by a footnote such as

²To facilitate the drawing of inked lines parallel to the lines of typing, the typist should type an underscore OUTSIDE the Table's left and right boundaries at the levels where these horizontal lines are to be drawn. A straight-edge joining these beyond-camera marks will then locate the lines correctly.

To receive a copy of this material, order document AM-76-000 from the Business Office, Mineralogical Society of America, suite 1000 lower level, 1909 K Street, M.W., Washington D.C. 20006. Please remit \$1.00 for the microfiche.

Illustrations

13. The principal criterion for accepting illustrations is the amount of important information they convey. The following types of illustrations can often be replaced by a short sentence in the text: location map, photograph of a massive mineral or a simply bedded outcrop, graph of a linear calibration, routine X-ray diffraction or differential thermal analysis results, previously published illustrations. On the other hand, a single line drawing can often be substituted for an extensive table.

14. Drawings and photographs will generally be reproduced at (A) 3 1/6" wide, (B) 6 1/3" wide, (C) 8 1/2" wide. For type (C), which are broadside or side-turn figures, the reproduced length should be between 5 1/2 to 6 1/2 inches. Figures of types (A) and (B) may be up to 8 1/2" long, including their captions. The originals of these drawings and photographs may be retained by the author until he is notified by the Editor that his manuscript has been accepted. Two sets of xerox or other type copies of the illustrations and figures should be included with each manuscript submitted.

When the manuscript is accepted, the illustrations (either originals or clear glossy prints at approximately 1 1/2 × sizes A, B, or C) should be sent to the Editor's Office.

15. Lines less than 0.1 mm when reduced to published size, or lines that are not black enough, may be lost in

TABLE 2. Standard Abbreviations for Common Title Words of Periodicals*

..... Original typed width = 103 elite spaces = 8 1/2"			
<u>Abstr act</u>	<u>Comm ission</u>	<u>Int ernational</u>	<u>Petrol ogy</u>
<u>Acad emy (Akad., Accad.)†</u>	<u>Commun ication</u>	<u>Invest igation</u>	<u>Phys ical</u>
<u>Adv ances</u>	<u>C omptes R endus</u>	<u>J ournal (Zh urnal)</u>	<u>Planet ary</u>
<u>Aeronaut ical</u>	<u>Conf erence</u>	<u>Jahrb uch</u>	<u>Proc eedings</u>
<u>Am erican</u>	<u>Congr ess</u>	<u>Kristallogr afia</u>	<u>Prof essional</u>
<u>Anal ytical</u>	<u>Contrib utions</u>	<u>Lab oratory</u>	<u>Prog ress</u>
<u>Ann als</u>	<u>Crystallogr aphy</u>	<u>Lect ures</u>	<u>Publ ications</u>
<u>Annu al</u>	<u>Dep artment</u>	<u>Magn etic</u>	<u>Publ isher</u>
<u>Appl ied</u>	<u>Dtsch = Deutsche</u>	<u>Mater ials</u>	<u>Q uarterly</u>
<u>Arch ives (Ark iv)</u>	<u>Dokl ady</u>	<u>Meet ing</u>	<u>Rep ort</u>
<u>Assoc iation</u>	<u>Ecol ogy</u>	<u>Mem oirs</u>	<u>Res earch</u>
<u>Astronaut ical</u>	<u>Econ omic</u>	<u>Mineral ogy</u>	<u>Rev iew</u>
<u>At omic</u>	<u>Electr ical</u>	<u>Miner als</u>	<u>Sb ornik (Zb irnik)</u>
<u>Aust ralia</u>	<u>Electron ic</u>	<u>Min ing</u>	<u>Schweiz erische</u>
<u>Beitr age</u>	<u>Eng ineering</u>	<u>Mitt eilungen</u>	<u>Sci ences</u>
<u>Ber ichte</u>	<u>Exp erimental</u>	<u>Mod ern</u>	<u>Sediment ary</u>
<u>Bibliogr aphy</u>	<u>Fed eral</u>	<u>Mol ecular</u>	<u>Soc iety</u>
<u>Br itain, or</u>	<u>Forsch ungen</u>	<u>Monatsh efte</u>	<u>Spectrochem istry</u>
<u>Great B ritain</u>	<u>Fortschr itte</u>	<u>NAS-NRC = National Academy</u>	<u>Stand ards</u>
<u>Bull etin (Bol., Boll.)</u>	<u>Geochem istry</u>	<u>of Sciences--National</u>	<u>Surv ey</u>
<u>Bur eau</u>	<u>Geogr aphy</u>	<u>Research Council</u>	<u>Tech nical</u>
<u>Can adian</u>	<u>Geol ogy</u>	<u>Natl = National</u>	<u>Technol ogy</u>
<u>Chem istry (Chim.)</u>	<u>Geophys ical</u>	<u>Nauk ovi</u>	<u>Trans actions</u>
<u>Circ ular</u>	<u>Inorg anic</u>	<u>Pap er</u>	<u>Z eitschrift</u>
<u>Collect ion</u>	<u>Inst itute</u>	<u>Petrogr aphy</u>	<u>Zentralbl att</u>
<u>Colloq uium</u>	<u>Instrum ent</u>	<u>Pet roleum</u>	<u>Zh urnal</u>
		<u>Words Not Abbreviated</u>	
<u>Any single-word title</u>	<u>Earth</u>	<u>Methods</u>	<u>Pacific</u>
<u>Acta</u>	<u>Fluorine</u>	<u>Mines</u>	<u>percent</u>
<u>Arkansas</u>	<u>hour</u>	<u>Mittel</u>	<u>Radio</u>
<u>Atti</u>	<u>Initial</u>	<u>mole</u>	<u>Soil</u>
<u>Austria</u>	<u>Interior</u>	<u>Nation</u>	<u>space group</u>
<u>Brazil</u>	<u>Kemi</u>	<u>Neue, Neues</u>	<u>X-ray</u>
<u>Clay or Clays</u>	<u>Mass</u>	<u>Nippon</u>	<u>Year Book</u>
<u>Colloid</u>		<u>Nord</u>	

* In this table the underlined portions or words indicate their standard abbreviations. However, the use of underlining in your manuscript instructs the printer to set the underlined material in italics. Fortunately, the abbreviations underlined above are customarily set in italics.

These abbreviations should end with periods.

For words not listed, check Access or, when in doubt, spell out the entire word in the List of References to your paper.

† In general, words with the same root have the same abbreviation. Related words in other languages usually have similar abbreviations, e.g., Acad emy, Akad emie.

reproduction. Shading reproduces badly; use stippling or cross hatching. Graph paper does not look well when reprinted: draft graphs with either no grid or a very open grid. Figures combining line cuts and half-tone reproductions of photographs are expensive to reproduce. On photomicrographs use a bar scale on the photograph (not outside of it), instead of a magnification factor in the legend.

16. Do not insert illustrations in the text. All illustrations are figures. Individual parts may be grouped as one figure having a single legend, providing they do not extend beyond one page. Letter parts of the figure, neatly for reproduction, in the corner of (rather than below) each part. All captions for figures should be typed double-spaced on a separate sheet, numbered consecutively with Arabic numerals, including a general legend for any group figures.

References

17. References should be cited in the text as: (Penfield, 1900), Towers and Chipman (1957), (Bowen *et al.*, 1933); they should not be listed by number. Only references mentioned in the text (or tables or figures) should be listed.

18. References should be arranged alphabetically by the last name of the senior author and placed at the end of the paper, as in the reference list below. Place the names of authors *after the senior author* in normal order (first name first). For ease in typesetting, the list of references should be double-spaced. Abbreviations generally follow those published in *Access* and its supplements (*Chemical Abstracts*). When you are unsure of an abbreviation, please spell out the full title word. See Table 2 for abbreviations of title words of journals frequently cited in *The American Mineralogist*.

19. References to unpublished material (manuscripts, reports, computer programs, personal communications, and the like) should be made in the text or acknowledgments section parenthetically or by footnote (see example below) rather than in the list of references. Specify the source person sufficiently so that he can be identified, for instance by his institution.

A report qualifies as published, and may be included in the list of references, if it is generally available to the world public. Reports from U. S. Government or Government-sponsored research are most generally available through the U. S. Department of Commerce National Technical Information Service, and such a report should be referred to by the NTIS document number ("AD," "PB," *etc.*), as in Busing *et al.* (1962) in Appendix.

20. Manuscripts *accepted* for publication, but which have not yet appeared in print, may be included in the list of references. Those which have been submitted but not yet accepted, and those which are under review or in the process of revision, should *not* be listed, but may be cited in the text, as: Brown and Gibbs (in preparation).

21. Reference to a presentation at a meeting should be to the published abstract, and should be identified as such just after the title of the paper. See Louisnathan and Gibbs (1971) in Appendix.

22. Translations, whether individual or from a cover-to-cover translation journal, should be listed by the original source, followed by the translated source in brackets. See Urusov (1967) in Appendix.

References

- AMERICAN CHEMICAL SOCIETY (1967) *Handbook for Authors*. Am. Chem. Soc., Washington, D. C.
- AMERICAN INSTITUTE OF PHYSICS (1965) *Style Manual*, Rev. ed. Am. Inst. Phys., New York.
- (ca. 1968) *Guides for the Preparation of Scientific Papers and Abstracts*. Am. Inst. Phys., New York.
- CONFERENCE OF BIOLOGICAL EDITORS (1964) *Style Manual for Biological Journals*. Am. Inst. Biol. Sci. Washington, D. C.
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- KENNARD, O., J. C. SPEAKMAN AND J. D. H. DONNAY (1967) Primary crystallographic data. *Acta Crystallogr.* **22**, 445–449.
- MCADIE, H. G. (1967) Recommendations for reporting thermal analysis data. *Anal. Chem.* **39**, 543.
- O'CONNOR, MAEVE AND F. PETER WOODFORD (1975) *Writing Scientific Papers in English*. Elsevier, New York, 108 p.
- PALACHE, CHARLES, HARRY BERMAN AND CLIFFORD FRONDEL (1944) *System of Mineralogy of . . . Dana, 7th ed.*, **1**, John Wiley and Sons, New York.
- U. S. GEOLOGICAL SURVEY (1964) *Suggestions to Authors*, Rev. ed. U. S. Government Printing Office, Washington, D. C.

Appendix: Sample entries for list of references

Journal articles:

- GRØNVOLD, F. AND H. HARALDSEN (1952) On the phase relations of synthetic and natural pyrrhotites (Fe_{1-x}S). *Acta Chem. Scand.* **6**, 1452–1469.
- PENFIELD, S. L. (1900) On graftedite, a new mineral from Grafton, New Hampshire, and its intergrowth with triphylite. *Am. J. Sci.* **9**, 20–32.
- ROBIE, R. A. (1966) Thermodynamic properties of minerals. *Geol. Soc. Am. Mem.* **97**, 437–458.
- TOWERS, H. AND J. CHIPMAN (1957) Diffusion of calcium and silicon in a lime-alumina-silica slag. *Trans. AIME*, **209**, 769–773.

Translated articles:

- URUSOV, V. S. (1967) Chemical bonding in silica and silicates. *Geokhimiya* **4**, 399–412. [transl. *Geochem. Int.* **4**, 350–362 (1967)].

Abstracts:

- LOUISNATHAN, S. J. AND G. V. GIBBS (1971) A comparison of Si–O distances in the olivines with the bond overlap populations predicted by the extended Hückel molecular orbital (EHMO) theory (abstr.). *Geol. Soc. Am. Abstr. Progr.* **3**, 636.

Reports:

BUSING, W. R., K. O. MARTIN AND H. A. LEVY (1962) ORFLS, a Fortran crystallographic least-squares refinement program. *U. S. Natl. Tech. Inform. Serv.* ORNL-TM-305.

Books:

DEER, W. A., R. A. HOWIE AND J. ZUSSMAN (1962) *Rock Forming Minerals. Vol. 1, Ortho- and Ring Silicates.* John Wiley and Sons, Inc., New York.

FRIEDEL, G. (1926) *Leçons de Crystallographie.* Berger-Levrault, Paris. 602 p.

Articles in Books:

HILLIG, W. B. (1952) Sources of weakness and the ultimate strength of brittle amorphous solids. In J. D. MacKenzie, Ed., *Modern Aspects of the Vitreous State*, Vol. 2. Butterworth, Inc., Washington.

SHOEMAKER, E. M., C. H. ROACH AND F. M. BYERS, JR. (1962) Diatremes and uranium deposits in the Hopi Buttes, Arizona. In A. E. J. Engel, H. L. James, and B. C. Leonard, Eds., *Petrologic Studies: A Volume in Honor of A. F. Buddington.* Geol. Soc. Am., New York. pp. 327-355.

Dissertations and Theses:

HALL, H. T. (1965) *The Systems Ag-As-S, Ag-Sb-S: Phase Relations and Mineralogical Significance.* Ph.D. Thesis, Brown University, Providence, Rhode Island.

More than one entry for an author:

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