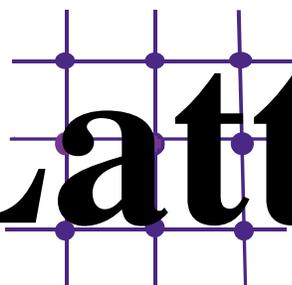


The Lattice



The Newsletter of the
Mineralogical Society
of America

Subscription and membership
information
is on page three.

1015 18th St., N.W., Ste 601,
Washington, D.C. 20036-5212
U.S.A.

ISSN 1526-3746

Table of Contents

President's Letter	p. 2
Notes from Washington	p. 4
XRF techniques	p. 5
All about <i>Am Min</i> Subs	p. 6
Stable isotopes	p. 7
IMA classifications	p. 10
Nanoparticles	p. 11
New members	p. 14
Meetings Calendar	p. 22
Collector's Corner	p. 23
Member in the News	p. 24
Lattice Deadline	p. 24
New publications	p. 26
In memoriam	p. 26
Advertisement info	p. 26
GMR contents	p. 27

New Association with Mineralogical Record

Cornelis "Kase" Klein, MSA President 2001

MSA Council voted unanimously at the October 24, 1999, meeting to establish a new association between MSA and *Rocks and Minerals* as well as *Mineralogical Record*. The motivation was both to augment the Society's activities in areas of interest to the serious amateur and mineral enthusiast, and also to expand the Society's outreach programs. The agreements reached with *Rocks and Minerals* were outlined by then President John Ferry in *The Lattice*, vol. 15, no. 4, November, 1999. It is my pleasure to announce that a similar agreement has recently been reached with *Mineralogical Record*.

The *Mineralogical Record*, now in its 32nd year of publication, is widely considered to be the leading international journal for advanced mineral collectors, amateur mineralogists and specimen-oriented professionals. Headed by Editor/Publisher, and MSA Fellow, Wendell Wilson (*wendwilsonite*, $\text{Ca}_2\text{Mg}(\text{AsO}_4)\cdot 2\text{H}_2\text{O}$, described in 1987 from Sterling Hill, N.J., and elsewhere), the magazine is the only scientific journal ever to have had a mineral named in its honor (*minrecordite*, $\text{Ca Zn}(\text{CO}_3)_2$, member of the dolomite group, described in 1983 from

Tsumeb, Namibia). It has furthermore been honored as the recipient of the 1994 Carnegie Mineralogical Award for "outstanding contributions in the field of mineralogy." Each issue is entirely mineralogical in focus, covering scientific, aesthetic, historical, regional, curatorial, hobbyist, and market-related aspects. All articles undergo peer review by the Board of Associate Editors and by outside reviewers. New species descriptions, new species abstracts, MSA abstracts from the annual Tucson Mineralogical Symposium, regionally focused mineralogical studies (a specialty) and historical studies, among other

subjects covered, are designed as long-term mineralogical references with special emphasis on thorough bibliographies.

The *Mineralogical Record* also publishes important IMA documents, including the IMA's hardcover *World Directory of Mineral Collections*, plus other mineralogical reference works such as *Fleischer's Glossary of Mineral Species* and *Glossary of Obsolete Mineral Names*. *Mineralogical Record* is made accessible through a comprehensive, hardcover index that is cumulative from volume 1.

The *Mineralogical Record*,

Continued on page 5

Symposium and Field Trip on Melts in Crust and Upper Mantle at GSA National Meeting

"Melt in the Crust and Upper Mantle: How Much, Where, For How Long, and What Significance for Geodynamics?" is the topic of a Pardee Keynote Symposium and topical session to be held at the Geological Society of America National Meeting, Boston, MA, November 5–8, 2001. The conveners are Tracy Rushmer, University of Vermont; Michael Brown, University of Maryland; George W. Bergantz, University of Washington; and Greg Hirth, WHOI.

Understanding the role of partial melt in the geochemical and dynamic evolution of the lithosphere has gained new momentum with the advent of higher resolution geochemical mea-

Continued on page 18

Letter from the President



Some comments on MSA's first Dana Medal, the Goldschmidt Conference, and two MSA Council decisions

By Cornelis ("Kase") Klein, MSA President

MSA Council established the **Dana Medal** in 1998 when it was first described as a "mid-career award." It was subsequently officially named the Dana Medal in honor of the legendary contributions by James Dwight Dana (1813-1895) and Edward Salisbury Dana (1849-1935) to the science of mineralogy. E.S. Dana was honorary MSA President from 1926 until 1935.

The Dana Medal is intended to recognize continued outstanding scientific contributions through original research in the mineralogical sciences by an individual in the midst of his or her career. The

medal is bronze, engraved with the recipient's name, and 3" in diameter (*see photograph*). The very first recipient of the MSA Dana Medal is George R. Rossman, Professor in the Division of Geological and Planetary Science at the California Institute of Technology. As President of MSA I had the honor and privilege of presenting the Dana Medal for 2001 to George Rossman in a specially scheduled session of the Goldschmidt Conference on Wednesday, May 23. George was introduced by his colleague from Caltech, Professor Paul D. Asimow, his citationist (*see group picture*). Following

the ceremonial aspects of the session, George gave a very enlightening and entertaining lecture entitled "The Beauty of Minerals" which in addition to aspects of beauty gave much insight into the role of water and hydrogen in essentially anhydrous minerals. In all, it was a festive and informative event held in one of the most elegant

large rooms of The Homestead Hotel.

The Dana Medal recipient for 2002 was announced during the Goldschmidt Confer-



Left to right: Cornelis Klein, George Rossman, and Paul Asimow

The Geochemist's Workbench[®]

We put **BUGS** in our software!

H₂O • Ag⁺⁺⁺ • Am⁺⁺⁺ • As(OH)₄⁻ • Au⁺ • B(OH)₃ • Ba⁺⁺ • Br⁻ • Ca⁺⁺ • HCO₃⁻ • Cs⁺ • Cl⁻ • Co⁺⁺ • Cr⁺⁺⁺ • Cu⁺ • Eu⁺⁺⁺ • F⁻

Growth and decay of microbial biomass in a laboratory experiment

Arsenate reduction by BACILLUS ARSENICOSELENATIS

Growth on acetate in a chemostat experiment of two strains of microbes, one fast, the other efficient

New in 3.2 —

- MICROBIAL METABOLISM AND GROWTH Model the geochemical and mineralogic effects of complex microbial communities
- CUSTOM RATE LAWS Specify kinetic rate laws of any form — No Programming needed!

GWB is your personal toolkit for—

- Reaction simulation
- Kinetics
- Surface chemistry
- Isotope fractionation
- "Pitzer equations"
- Speciation
- Bioavailability
- Redox disequilibrium
- Redox-pH diagrams
- Catalysis, enzymes, and more!

Price —
\$2,900.00 (\$1,600.00 academic)
Industry • Government • Consulting
Academic • Classroom

New! Version 3.2

Windows 95/98 and NT/2000

Photo: B. Fouke

RockWare[®]
Earth Science Software

The Geochemist's Workbench[®] is a registered trademark of the University of Illinois.

Over 200 Software Solutions at <http://www.rockware.com>
 2221 East Street, Suite 101 • Golden, Colorado 80401 • 800.775.6745, 303.278.3534 • fax: 303.278.4099



ence to be Michael F. Hochella, Jr., Professor in the Department of Geological Sciences at the Virginia Polytechnic Institute and State University in Blacksburg, Virginia. As many of you undoubtedly know Mike, with his co-convenor Bob Bodnar, organized the very successful Goldschmidt Conference in

Hot Springs, Virginia (more about that below). The Dana Medal 2002 presentation is planned for the joint spring AGU-MSA-GS meetings in Washington, D.C.

The eleventh annual **V.M. Goldschmidt Conference** was held in the tiny town of Hot Springs, Virginia, in the very large and grand hotel The Homestead, from May 20-24, 2001, with Virginia Tech as the host. Conference sponsors were the Geochemical Society, MSA, Lunar and Planetary Institute, the European Association of Geochemistry, NASA, Oak Ridge National Laboratory, and Virginia Polytechnic Institute and State University. The conference had about 950 registered attendees, and 425 oral and poster presentations; 296 of the participants came from outside the USA representing a total of 28 countries. The overall success of this meeting is captured in some of the remarks written to Bob Bodnar and Mike Hochella, with a copy to me, by Michael Brown (Department of Geology, University of Maryland): "I wanted to write to thank you for such a wonderfully successful Goldschmidt meeting. I thought the range of people and science, from mainstream geophysics to microbiology, with, of course, my beloved petrology right in the middle, was wonderful. Adding one of the mineralogical societies as a co-sponsor brings in everything from mineral physics to planetary geology, but in a wider context than just geochemistry, which makes for a much better meeting scientifically." (I will come back to the co-sponsorship of spring meetings when I make some comments on the MSA Council discussions, below). On behalf of MSA I want to express our enormous gratitude for the outstanding success that Bob and Mike achieved in this conference. Not only was the technical program very broad and successful but the meeting site, The Homestead, was a very efficient venue for the scientific sessions and a most elegant and beautiful "home" for the participants. Bob and Mike were lucky indeed to have been able to relocate the whole conference to this hotel (only eight months ago) after the prior arranged for hotel in Roanoke, Virginia was unable to fulfill their earlier commitment. Again many, many thanks.

The Geochemical Society and MSA co-sponsored a short course, prior to the Goldschmidt meeting, entitled "Molecular Modeling Theory and Applications in the Geosciences" in Roanoke, Virginia. The conveners were Randall T. Cygan, Sandia National Laboratories, Albuquerque, New Mexico, and James D. Kubicki of Pennsylvania State University, University Park. It attracted seventy-five participants in addition to the fourteen speakers. Volume 42 of the Reviews of Mineralogy and Geochemistry Series entitled *Molecular Modeling Theory: Ap-*



The Lattice is published quarterly (February, May, August, November) by the Mineralogical Society of America. It is distributed to MSA members as a service. Articles and letters are welcome.

The Mineralogical Society of America is composed of individuals interested in mineralogy, crystallography, and petrology. Founded in 1919, the Society promotes, through education and research, the understanding and application of mineralogy by industry, universities, government and the public.

Membership benefits include: *American Mineralogist*, published bi-monthly; 25% discount on volumes in the *Reviews in Mineralogy and Geochemistry* series; *The Lattice*; special subscription rates for *Mineralogical Abstracts*, *Physics and Chemistry of Minerals*, *Journal of Petrology*, *Rocks and Minerals*, and *Mineralogical Record*; reduced registration fees at MSA short courses; member rates for the MSA/Geological Society of America annual meeting and member rates at MSA's spring meeting with the American Geophysical Union; participation in a Society that supports the many facets of mineralogy.

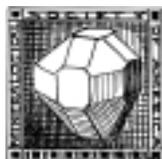
Dues for 2001: professional members \$50; student members \$5. *American Mineralogist* subscription: professional members add \$30; student members add \$25. Membership is on a calendar year basis. Individuals who join after January 1, 2001 will be sent all back issues of volume 85 for 2001.

Additional membership information and an application, and/or a price list of the Society's publications are elsewhere in this newsletter, or contact the Business Office.

Institutions may subscribe to the 2001 volume of *American Mineralogist* for the annual rate of \$480 in the US and \$490 for non-US addresses. The subscription price includes any new volumes of the *Reviews in Mineralogy and Geochemistry* series and issues of the *Lattice* published during the calendar year of the subscription. Payment must be received in full before a subscription will be started.

2001 President: *Cornelis Klein*, Univ. of New Mexico
Past-President: *William D. Carlson*, Univ. of Texas-Austin
Vice President: *Rodney C. Ewing*, Univ. Michigan
Secretary: *David Jenkins* Binghamton Univ.
Treasurer: *James G. Blencoe*, Oak Ridge Nat. Lab.
Editor of The Lattice: *Andrea Koziol*, University of Dayton
MSA Executive Director: *J. Alexander Speer*
Production Manager: *Rachel A. Russell*

Mineralogical Society of America
 1015 Eighteenth Street N.W., Suite 601
 Washington, D.C. 20036-5212, U.S.A.
 Tel: (202) 775-4344; Fax: (202) 775-0018
E-mail: business@minsocam.org



Notes from Washington

by J. Alexander Speer

•Ballots for the 2001 election of 2002 MSA officers and councilors were mailed to members at the end of April 2001. They are due back in the Business Office by August 1, 2001. Voting is an important responsibility for MSA members because the individuals you elect to office decide on the direction of the Society. Third dues renewal notices were sent with the ballots to those 2000 members from whom we had not received a 2001 renewal through April 10, 2001. If you have not yet received a ballot, or a renewal notice if you need one, please contact the MSA Business Office. This will be the last *Lattice* mailing to members who have not renewed for 2001.

• At its 2001 Spring Meeting, MSA Council voted to keep 2002 professional member dues at the 2001 cost of \$50. Student dues also remain at \$5. New for 2002 will be a member subscription to the electronic version of *American Mineralogist* at \$10. Member subscriptions to the paper copy *American Mineralogist* were increased to \$35 from \$30, and will include access to the electronic version. This is a 17% increase, but member subscriptions were last changed in 1992, when the journal still had 6 rather than 8 issues a year. Institutional subscriptions to the paper journal were increased to \$530 for subscribers with U.S. addresses and \$550 for subscribers with non-U.S. addresses. Institutional subscriptions to the electronic journal will not be available until 2003.

• MSA 2002 membership renewals will start with an electronic reminder and membership renewal at the beginning of September. If you have never shared your current e-mail address with MSA and would like to participate in the online renewal, please send us your address. Hard copy renewal notices will be sent by the end of October for those who have not renewed by then. You can save your Society money by renewing early whether you choose to use the electronic version in September or the traditional paper version in October. As encouragement there will again be a \$5 discount on the professional membership dues for renewals received before December 31, 2001.

•In the days of snail mail alone, the post office might return after many weeks or months certain classes of mail to us indicating that the individual was no longer at that address and, with any luck, what the new address might be. Usually the mail was forwarded to the individual until the forwarding order expired, after that the mail was returned to us with no clue as to the new address. Mail sent outside the U.S. was seldom returned. You may notice on much of MSA's mail now there is a "Return Service Requested" indicia. This tells the US Post Office not to forward the mail but to return it to us with the new address. This costs us about 50 cents per returned item but the service does alert us to address changes much faster than in the past. Unfortunately, the service is available for US addresses only. No matter where you receive your mail, you can save your Society money by telling us of any address changes in a timely manner.

You can do this by mail, phone, fax, e-mail, or online. Still, do not be surprised if the next 1 or 2 mailings from MSA have your old address—these pieces were probably in the mail stream 1–2 months before you told us of your address change.

•In addition to any mail address changes, make sure to tell us about any changes in your phone number and e-mail. There is no organization such as the US Postal Service to alert us about changes. MSA can just no longer contact you. The spread of cellular phones and increasing numbers of required phone numbers have led to new overlaid area codes and exchanges. E-mail address changes can also be rapid when you change service providers or servers. These make it impossible for us to know your new contact information unless you tell us.

•There are three new MSA/GS publications printed since the first of the year—Reviews in Mineralogy and Geochemistry (RiMG) Volume 40: *Sulfate Minerals: Crystallography, Geochemistry, and Environmental Significance*, 2000; C. N. Alpers, J. L. Jambor, and D. K. Nordstrom, Eds.; Volume 41: *High-Temperature and High Pressure Crystal Chemistry*, 2001; R. M. Hazen and R. T. Downs, Eds.; and Volume 42: *Molecular Modeling Theory: Applications in the Geosciences*, 2001; Randall T. Cygan and James D. Kubicki, Eds. Descriptions of these and ordering information can be found at the MSA website and elsewhere in this issue.

•Postal rates in each class increased on 1/7/2001. There was a penny per letter increase on first class, 7.2% increase in nonprofit periodicals, 4.8% increase in nonprofit standard (bulk) mail, and, depending on destination, about a 10% increase in airmail rates. All these were well publicized, expected, and held to a minimum by various types of publicity and lobbying groups. A rate that MSA uses extensively that did not benefit from such special attention was international surface mail rates. Increases here were 200–300%. The only good news is that the rates to Canada decreased; though that country seems to have a renewed interest in collecting customs duties. The new rates are somewhat erratic. Some higher rates depend on distance from the US, but others reflect the higher fees some nearby countries charge the US Postal Service for receiving mail from the US. Adding insult to the injury, the cost per pound increases rapidly to 4 pounds, then slowly declines at greater weight. 4 pounds is the dividing line between surface letter and surface parcel, though it is not clear why the rate per pound should be so high at this dividing line. 4 pounds corresponds roughly to 2 RiMG volumes, making shipping costs on 2 books the greatest per book. There will be another rate increase within the month and news accounts indicate another by the end of the year. It appears that the US and other Postal Services have forgotten the lessons learned from the uniform and reduced postal rate reforms of the 1840s–1870s and are headed to repeat the postal failures of earlier times.

After resisting for many years, MSA will begin a separate charge for shipping on book orders starting this spring. Separate shipping will make it easier to adjust for varying rates as opposed to try to continually adjust book prices. Given the high rates, we encourage non-US address members customers to combine book orders to lower the shipping cost per book where possible.

•More sections of the MSA website (www.minsocam.org) continue to come online.

The **Reviews in Mineralogy and Geochemistry** section contains a list of all errata of which we are aware. If you are an author of a chapter, and would like to post corrections, please send them

to us. We prefer the text be sent as a text file and any corrected figures as gif or pdf files.

The **Links** section has been reorganized and expanded. There are now other **Society and Publications** links [Societies & Organizations, Journals (technical mineral-related publications), Magazines (broad interest mineral-related publications), and List of mineralogical, lapidary and fossil clubs in the U.S.A.] and a separate listing of **Mineral-related** links [Sites with extensive, mineral-related links, Mineral Databases, Tutorials, sites devoted to a specific mineral, sites devoted to a specific mineralogical topic, sites devoted to mineral localities, sites that are mineral-related (but otherwise hard to categorize), and mineral-related Web-rings]. If there are links that you think we should include, please let us know.

There is a now a **Collector's Corner**, described elsewhere in this issue of *The Lattice* by David von Bargen.

The MSA website has gained some recognition. Most important was the notification on 1/14/2001 that Institute for Scientific Information (ISI) will include the MSA website in their *Current Web Contents*. More description about this can be obtained by selecting the *Current Web Contents* logo on the MSA website. The same month *Lapidary Journal* included the MSA website in their "Sites to See." They described the site as being neither flashy nor sexy but providing solid, invaluable content.

•There have been two book reviews of Reviews in Mineralogy volume 38, *Uranium: Mineralogy, Geochemistry and the Environment*: K. Morris, 2001, *Journal of Petrology* 42, 853–854 and by E. K. Hyslop, 2001, *Mineralogical Magazine* 125, 149–150; as well as a book review of volume 39, *Transformation Process in Minerals*, by M. D. Welch, 2001, *Mineralogical Magazine* 125, 313–314. The reviewers felt the books were well worth the price.

MSA Workshop at the GSA Meeting: Practical application of XRF techniques to the analysis of geological materials

Designed for both novice and experienced users of XRF techniques in geology, this workshop will focus on practical approaches to XRF analysis of soils, rocks, waters, petroleum-based products (oils, gasolines, etc.) and other types of materials typically encountered by geoanalysts. The course will emphasize practical exercises in sample preparation, calibration methods, and analysis of several different geological sample types. The one-day workshop will take place on Monday November 5, 2001, at the application facility at Philips Analytical in Natick, MA. There is a limit of 20 participants and there is no fee. Philips Analytical will provide transportation back and forth from the Hynes Convention Center, as well as lunch for all course participants. To enroll, (1) register on the MSA home page: <http://www.minsocam.org> or (2) send your name, address, telephone, fax, and email addresses to the MSA Business Office, 1015 18th St. NW Ste 601, Washington, D.C. 20036-5212, U.S.A. Phone: 202-775-4344. Fax: 202-775-0018. E-mail: business@minsocam.org. For additional information, please contact David Coler (david.coler@philips.com).

MSA, Continued from page 1

Inc., is a non-profit scientific/educational corporation, which is self-sustaining through its 7500 subscribers and purchasers worldwide. In addition it maintains a superb corporate library rich in historical mineralogical works, information from which is made available to authors engaged in historical or technical research.

The cooperative arrangement between MSA and *Mineralogical Record* involves five specific agreements. First, all MSA members will be eligible to subscribe to *Mineralogical Record* at a 15% discount. The subscription option will appear on your MSA membership renewal form starting soon, and is similar to the agreement that MSA currently enjoys with other publications such as *Rocks and Minerals*, *Journal of Petrology*, and *Physics and Chemistry of Minerals*. Second, *Mineralogical Record* will have a page on the MSA website to list current tables of contents for their journal, announcements, or other relevant information, as well as a link to the *Mineralogical Record's* website. Third, MSA will have a quarter page in the *Mineralogical Record*, as a regular feature, for announcements, advertisements, membership forms, etc. MSA will reciprocate by providing the *Mineralogical Record* with a quarter page in *The Lattice* for announcements, subscription forms, or other appropriate material. Fourth, MSA and *Mineralogical Record* will exchange promotional materials that will be displayed at each

other's booths at meetings and mineral shows. Finally, *Mineralogical Record* will periodically offer some of its other mineralogical books and publications to MSA members at a 25% discount. These arrangements benefit the *Mineralogical Record* organization by providing an opportunity to expand its readership, and also MSA by potentially expanding the number and diversity of the readership of *American Mineralogist*.

One of the greatest advantages of this new relationship between MSA and *Mineralogical Record*, however, is a new opportunity for outreach for members of the Society. Our association with *Mineralogical Record* offers MSA members a new outlet for the publication of appropriate mineralogical research and review articles of significance to a broader audience. I strongly encourage MSA members to submit appropriate manuscripts to *Mineralogical Record*, where the exposure may serve to recruit one of the next generation of mineralogists and earth scientists.

As with the other journals having an association with MSA, the editorial policies and scope of the *Mineralogical Record* will remain entirely in the hands of the journal's staff. Details of manuscript submission and suggestions for authors will be found at the corporation's website: www.mineralogicalrecord.com.

I wish to thank Wendell Wilson of the *Mineralogical Record* for helping to make this new association possible. I look forward to an enjoyable and productive relationship between our two organizations.

VOTE!

All about submitting to the *American Mineralogist*

By Rachel A. Russell, Managing Editor, *American Mineralogist*

Right now we are somewhat under the historical average for submissions, and submission-to-publication times have never been faster, so this is a great time to submit! We welcome all topics: environmental mineralogy, biomineralization, clay minerals, planetary materials, crystallography, geochemistry, and petrology. We really do welcome anything related to earth sciences that passes our peer review, and the inside back cover of every issue highlights many of the specialties but does not limit them.

STEPS TO SUBMISSION

Important information for authors is published on the inside back cover of each issue of the *American Mineralogist*. The key idea when submitting is to make it easy for the Editors and Reviewers to understand your work. Use double spacing, with a 10 or 12-size readable non-condensed font, and nice inch-wide margins on all sides. Save paper by putting the title, bylines, affiliations, and abstract all on the same page, as much as possible. I also suggest keeping notation and abbreviations out of titles. Keep titles short, as much as is realistic for your paper. The body of your manuscript follows, with references after that. Figure captions go after references, Tables go after that, Figures are next, and any footnote or deposit material is last. The goal of this standard format is to make it easy for the editors and reviewers. If they like to look at the figures first, they flip to the back, or perhaps they quickly pull out the tables first and start there.

Do take a moment *before* submission and look at your figures. Are they readable? Are the fonts too small or large? Can you make the proportions of the figures the same? Can you use just one font in the figures? Did you follow our proper abbreviations, such as wt% for weight percent, and *T* for temperature? I honestly think that starting with figures that are as clear as possible helps at every step on the way to publication.

Mail 3 copies of your article, with a cover letter, to the *American Mineralogist*, care of the Washington, D.C., address (see inside back cover of any issue). Right now, although web-based submission is coming, we still need 3 copies of your manuscript, tables, and figures and 1 cover letter. The cover letter must state that the manuscript "has not been previously published, wholly or in part, and is not and will not be submitted elsewhere for publication while it is in review." Your complete and proper mailing address, phone, fax, and especially e-mail address must also be included. As mentioned in the previous Lattice (February 2001), if any of your figures should be printed in color, go ahead and tell us up front. If you will be requesting use of the Color Fund, then explain the reasons as well. It will not affect your peer review, but it will speed things up later.

TECHNICAL AND TYPESETTING NOTES

The only scientific change to note is that our Technical Editor for Crystal Structures, Dr. Robert T. Downs, who continues to check all the crystallography tables for any sort of problems, has requested that the site occupancy data be included in the crystallography data tables. Recently, after we log those new

submissions in, we have begun sending requests to those authors, which asks them to send Dr. Downs the material in Word or ASCII format. This procedure should make the double-checking easier for everyone.

There is no need to have small caps, or all caps, or any other formatting besides bold, italic, subscripts and superscripts as appropriate. In fact, you can simply make a "Note to typesetter" on the front page of your manuscript regarding any complex notation such as stacks, subscripts to subscripts, or overbars (i.e., Miller Indices). For example, many people will have 1-11 in their paper and tell us that this means the first 1 has an overbar, while 11-1 would mean the second 1 has an overbar. This makes it easier to type up the manuscript, and it is very clear to editors, reviewers, and us.

TIMELINE

Allow time for your manuscript to reach us, which depends on where you live and how you mailed it. Once a week we assign all new manuscripts to an associate editor and promptly mail the packets out to them. We notify the corresponding author and associate editor of the assignment via e-mail that same day.

Each associate editor has his or her own style, but it is likely the corresponding author will hear from the associate editor in a few weeks that the paper is in review. Generally, peer review should take about three months, although it varies greatly. But the corresponding author can send the associate editor a query at this point to obtain information. There could be a lot or a little communication but typically most papers will need some revision. At this point the Associate Editor will definitely contact the corresponding author. There are things to do during the revision that are not necessary in the first submission, as the complete author instruction information on the web site makes clear. When the revision is complete it is sent back to the Associate Editor, **not** the editorial office.

The associate editor then decides if the revision was satisfactory. There could be more discussion and communication with the author at this point. There could be another peer review. Or the next communication could be a letter of rejection from one of the Editors with advice on how to re-submit.

Most likely, however, the next communication will be an e-mail from the editorial office in Washington, notifying you that the paper is in "pre-accept" phase and trying to solve any technical problems at this point. It is at this point that electronic tables and text are required. When there are no problems, the file goes to one of the Editors; he or she reviews everything, mediates anything, and edits the paper. The corrected final paper is sent back to the editorial office and we mail the official acceptance letter, both paper and email versions. It is typically at this time that electronic artwork, if available, is requested.

After acceptance, the corresponding author is sent proofs to correct, and after that the paper is published!

Finally, at every step it is vital for you to notify the associate editor of any extended leave plans, or alternate e-mail addresses,

Continued on page 18

Mineralogical Society of America Short Course Announcement

STABLE ISOTOPE GEOCHEMISTRY

Dates: November 2-4, 2001 (preceding the Mineralogical Society of America-Geological Society of America Annual meeting in Boston, MA)

Times & Location: Short Course sessions are from 8:30 am to 5:30 pm Saturday and 9 am to 4:30 pm Sunday. There is an informal welcoming reception from 7 to 9 pm Friday evening, November 2. All events are at the at the Colonnade Hotel, 120 Huntington Avenue, Boston, MA 02116 USA phone (617) 424-7000 fax: (617) 424-1717, <http://www.colonnadehotel.com/>.

Convenors: *John W. Valley*, Dept. of Geology and Geophysics, University of Wisconsin 1215 W. Dayton St., Madison, WI 53706-1692, USA. phone: (608) 263-5659; fax: 608-262-0693; e-mail: valley@geology.wisc.edu

David R. Cole, Oak Ridge National Lab, Chemical & Analytical Science Division, Bldg 4500-S, MS 6110, Oak Ridge, TN 37831-6110 USA. phone: (423) 574-5473; fax: (423) 574-4961; e-mail: coledr@ornl.gov

Fees:

		<i>on or before 8/31/2001</i>	<i>after 8/31/2001</i>
Professional Registration:	Member	\$ 265	\$ 315
	Non-member	\$ 350*	\$ 400*
Student Registration:	Member	\$ 75	\$ 125
	Non-member	\$ 110*	\$ 160*
Speaker		none	none

* includes MSA membership dues for 2002.

Registering: Registration forms are available from the MSA Business Office, 1015 Eighteenth St NW Ste 601, Washington, D.C. 20036-5212, USA. Tel: (202) 775-4344 Fax: (202) 775-0018 e-mail: business@minsocam.org; or from the MSA Home Page (<http://www.minsocam.org>). Registration forms with payment must be returned to the MSA Business Office. Registration fees will be fully refunded if cancellation is received in writing on or before October 5, 2001. You can also register online with a credit card. Registration is limited to 100 participants. All participants and speakers must register.

Practical: Registration fee includes MSA short course sessions, refreshments at breaks, lunches on Saturday and Sunday, and the *Reviews in Mineralogy and Geochemistry* volume. Registration fee does not include room, other meals, or transportation costs to or from the short course site. Participants may contact one of the GSA hotels or the Colonnade Hotel, 120 Huntington Avenue, Boston, MA 02116 USA phone (617) 424-7000 fax: (617) 424-1717, <http://www.colonnadehotel.com/> to make reservations, pay for rooms, etc. Information on the short course, lodging, ground transportation, and course updates will be on the MSA Home Page (<http://www.minsocam.org>).

Student Scholarships: A limited number of student scholarships covering some portion of the registration fee will be available. If you will be a registered student for Fall 2001, and would like to be considered for a scholarship, enclose a brief statement, less than 500 words, describing your reasons for wanting to attend the short course. Send this with your registration before August 31, 2001. This might include your background, publications, the relation of stable isotope geochemistry to your thesis research, or future plans.

Short Course Description

Stable Isotope Geochemistry is central to the study of the solid Earth, its atmosphere, hydrosphere, biosphere, and its extraterrestrial environment. New analytical technology of the past decade is revolutionary, causing wider application and more fundamental understanding. This short course will show how isotope ratios in minerals, rocks and fluids provide evidence for understanding a wide range of natural phenomena including: paleoclimate, marine sedimentation, geomicrobiology, biogeochemical cycles, thermal history, hydrothermal/metamorphic fluid flow, and igneous petrogenesis. Speakers will review these topics - with emphasis on O, C, H, and S isotopes - and the principles of equilibrium and kinetic isotope exchange.

Topics and Speakers/Authors

Equilibrium oxygen, hydrogen, and carbon isotope fractionation factors applicable to geological systems.....	<i>Tom Chacko and David R. Cole</i>
Rates and mechanisms of isotopic exchange.....	<i>David R. Cole and Sumit Chakraborty</i>
Fractionation of the isotopes of carbon and hydrogen in biosynthetic processes	<i>John M. Hayes</i>
Stable isotope variations in extraterrestrial material.....	<i>Kevin D. McKeegan and L.A. Leshin</i>
Oxygen isotope variations of basaltic lavas and upper mantle rocks.....	<i>John Eiler</i>
Stable isotope thermometry.....	<i>John W. Valley</i>
Metamorphic fluid flow	<i>Lukas Baumgartner and John W. Valley</i>
Stable isotopes in seafloor hydrothermal systems: Vent fluids, hydrothermal deposits, hydrothermal alteration, and microbial processes.....	<i>W.C. Pat Shanks</i>
Isotopic ratios of precipitation: On beyond paleothermometry	<i>Richard B. Alley and Kurt M. Cuffey</i>
Isotopic evolution of the biogeochemical carbon cycle during the Precambrian.....	<i>David J. Des Marais</i>
Isotopic biogeochemistry of marine organic carbon.....	<i>Katherine H. Freeman</i>
Biogeochemistry of stable sulfur isotopes	<i>Donald Canfield</i>
Causes of stratigraphic variation in marine carbon isotope ratios.....	<i>Robert L. Ripperdan</i>

On the IMA Classification of Pyroxenes and Amphiboles

By Tomas Feininger, Département de Géologie, Université Laval, Québec, Canada G1K 7P4

A classification is a system to put in order a series of related objects, in order to show affinities and to ensure a degree of uniformity of usage (Oxford English Dictionary 1989). Other purposes are to enhance clarity, to assure consistency, to avoid ambiguity, and to discard obsolete terms. Ideally, the reform of a classification should retain as many terms of historical significance and common usage as is possible. Not only does this make a transition easier, but also it is kind to users. An example is afforded by the Streckeisen (1967) scheme of classifying igneous rocks. Whereas the compositional fields of many common rocks types (granite, quartz monzonite, granodiorite...) differ substantially from those of the countless earlier classifications, the terminology is largely intact.

Recent IMA classifications of the amphiboles (Leake et al. 1978, 1997) and the pyroxenes (Morimoto et al. 1988) have attempted to establish rigor and precision within these complex mineral groups based chiefly on chemical composition. This is laudable, especially now that electron microprobe analyses have become routine. Today, when a geologist or mineralogist uses the terms actinolite or omphacite, for example, it is clear, within narrowly defined limits, exactly what is meant. In the old days, actinolite covered a multitude of pale blue-green amphiboles, and omphacite was any grass-green pyroxene in a garnetiferous rock.

My contention here is that the new IMA classifications of pyroxenes and amphiboles do violence to history and in some cases seriously disrupt usefulness. In short, some unwise choices were made, and nearly all at the expense of the teacher of mineralogy, the petrographer, or the field geologist. I shall touch on a few abuses; the perceptive mineralogist will already have found many others.

The pyroxene classification is particularly ill considered and has two overridingly offensive parts.

(1) The orthopyroxene series. With a simple stroke of the classifier's pen, field practitioners have been denied such time-honored and above all useful terms as bronzite and hypersthene. Bronzite, so aptly named, is one of the rare pyroxenes readily identifiable in the field. Hypersthene is beautifully pleochroic and a guidepost for students. Traditional enstatite (En_{100-90}) and hypersthene (En_{70-50}) are quite distinctive optically and different paragenetically, yet we are now to call the pair simply enstatite. With the demise of hypersthene, do norite (hypersthene gabbro) and charnockite (hypersthene metagranite) disappear as well? Let us unite to restore the useful division of the orthopyroxene series with its handy and chemically precise members: enstatite, bronzite, hypersthene, ferrohypersthene, eulite, and ferrosilite.

(2) The demise of salite. The calcic, alumina-poor clinopyroxenes (the diopside-hedenbergite series) used to have a pair of commanding intermediate members: salite

and ferrosalite. Now banished, these common minerals, which are so widespread in skarn and pyroxene amphibolite, must be described as diopside or hedenbergite. So much information is lost! The dark-brown to black clinopyroxene (Di_{60}) in granulite-facies amphibolite north of Québec City, for example, bears little affinity or resemblance to the white to light-gray diopside (Di_{98}) in adjacent marble. Yet, based on their compositions, which are altogether distinct, the new IMA classification compels that the two pyroxenes be called diopside. Worse, the intimate relationship of diopside to tremolite, one of the cornerstones of metamorphic petrology, has been destroyed. Whereas tremolite continues to occupy a realistically narrow window ($Mg/(Mg + Fe) = 1.0-0.9$), diopside now has the barn door ($Mg/(Mg + Fe) = 1.0-0.5$). This disparity is confusing and will derail students and geologists alike. That diopside can retrograde to actinolite is an aberration waiting to be corrected by the repatriation of salite, bounded by the appropriately restricted ranges for diopside ($Di_{1.0-0.9}$) and ferrosalite ($Di_{0.5-0.1}$), with hedenbergite being $Di_{0.1-0.0}$.

The amphibole classification is relatively more thoughtful. Here again, though, two points merit consideration.

(1) The demise of crossite. This is especially unfortunate because the mineral survived the first cut (Leake et al. 1978), only to fall to the second swipe of the axe (Leake et al. 1997). Crossite is an unusual amphibole in that commonly it can be identified optically. On a practical level, the demise of crossite has erased the mineralogical distinction between the well-established blueschist terrains of Japan and California. Once they were characterized, respectively, by the occurrence of crossite and glaucophane. Now the contrast between the two terrains is blurred and lost to view; both carry only glaucophane.

(2) Basaltic hornblende (or oxyhornblende, or lamprobolite) deserves its place in the sun. This is another amphibole that is distinctive optically, chemically, paragenetically, and that possesses a long and cherished history. To refer to this arresting amphibole as "ferri-magnesian hastingsite" is insulting!

Permit me to make a few general closing comments, the first on the use of pyroxene and amphibole non-minerals. Certainly we all are aware that "uralite," "bastite" and so on are not minerals. They are mixtures: fine-grained aggregates of various phases in unfixed proportions. Yet, they (and other non-minerals such as saussurite, pinite, leucoxene, iddingsite...) are useful because they conjure up clear mental images. In a single word, each carries substantial petrogenetic information. We should not discourage use of these terms (the IMA classifications have banished them) but, on the contrary, we should emphasize their semantic advantages and encourage their use, ever keeping in mind that

Continued on page 18

Mineralogical Society of America Short Course Announcement

NANOPARTICLES IN THE ENVIRONMENT AND TECHNOLOGY

Dates: Short Course sessions are December 8 and 9, 2001. The short course will start at 8 a.m. on Saturday and end early afternoon on Sunday so people can attend the American Geophysical Union Meeting in San Francisco, CA that starts Monday, December 10. There is a reception Friday, December 7 from 7:00-10:00 pm.

Location: The sessions will be held at the University of California, Davis Conference Center, 423 First Street, Davis, CA 95616, ph: (530) 757-3259 fax: (530) 757-7943.

Conveners: *Jillian F. Banfield*, Department of Geology & Geophysics, University of Wisconsin - Madison, 1215 W Dayton St., Madison, WI 53706-1692 USA; phone: (608) 262-0915; fax: (608) 262-0693; e-mail: jill@geology.wisc.edu
Alexandra Navrotsky, Department of Chemical Engineering & Materials Science, University of California-Davis, 1 Shields Dr., Davis, CA 95616-8779 USA; phone: (530) 752-3292; fax: (530) 752-9307; e-mail: anavrotsky@ucdavis.edu

Fees:		<i>on or before 10/19/2001</i>	<i>after 10/19/2001</i>
Professional Registration:	Member	\$ 200	\$ 265
	Non-member*	\$ 285	\$ 350
Student Registration:	Member	\$ 70	\$ 90
	Non-member*	\$ 110	\$ 130
Speaker		none	none

* includes MSA membership dues for 2002.

Registering: Registration forms are available from the MSA Business Office, 1015 Eighteenth Street NW Ste 601, Washington, DC 20036-5212, USA. ph: 202-775-4344 fax: 202-775-0018 e-mail: business@minsocam.org. You may also register online on the MSA Home Page at www.minsocam.org. Registration forms must be returned to the MSA Business Office with payment. Registration is limited to 100 participants. All participants and speakers must register. Payment must accompany this form, which will be fully refunded if cancellation is received in writing on or before November 9, 2001.

Practical: Registration fee includes MSA short course sessions, refreshments at breaks, lunch on Saturday and Sunday, Saturday evening banquet, the *Reviews in Mineralogy and Geochemistry* volume, and ground transportation from Davis, CA to the AGU Meeting on Sunday. There is a reception Friday, December 7 from 7:00-10:00 pm. Registration fee does not include room, incidentals, or other transportation costs to or from Davis, CA. Both participants and speakers must make arrangements and pay their own lodging and ground transportation to reach the short course.

	rate	address	telephone	distance
Aggie Inn	\$77-132	245 First Street, Davis, CA 95616	(530) 756-0352	1 block
Econolodge	\$55-64	221 D. Street, Davis, CA 95616	(530) 756-1040	4 blocks
University Park Inn and Suites	\$75-\$120	1111 Richards Blvd, Davis, CA 95616	(530) 756-0910	15 minutes walk
Motel 6	\$40-52	4835 Chiles Road, Davis, CA 95616	(530) 753-3777	3.5 miles
Hallmark Inn		110 F Street, Davis, CA 95616	(530) 753-3600	5 blocks
University Lodge (Best Western)	\$60-75	123 B Street, Davis, CA 95616	(530) 756-7890	2 blocks
Palm Court Best Western	\$110-140	234 D Street, Davis, CA 95616	(530) 753-7100	4 blocks
Davis Bed and Breakfast Inn	\$60-70	422 A Street, Davis, CA 95616	(530) 753-9611	less than 1 block
University Inn Bed and Breakfast	\$55-80	340 A Street, Davis, CA 95616	(530) 756-8648	less than 1 block
Best Western	\$60-85	Dixon	530-678-1400	10 minute drive
Motel 6	\$32-44	Woodland	530-666-6777	10 minute drive
Comfort Inn	\$45-66	Woodland	530-666-3050	10 minute drive

Ground transportation from San Francisco International (SFO) and Sacramento Airports (SMF) is available with the Davis Airporter shuttle (800-565-5153) between 4 a.m. and 11 p.m. The Davis Airporter requires a reservation to be made 5 days in advance. One-way cost from the Sacramento airport

is \$18, from the San Francisco airport is \$50. Transportation from UC Davis to the San Francisco Moscone Center, site of the Fall AGU meeting, will be provided by University of California at Davis (UCD) Fleet Services on December 9, 2001. Buses will leave Davis at 5 pm. This is included in the course registration and if you wish to use this bus service, please indicate this on the registration form.

Short Course Description

Nanoparticles (particles with nanometer-scale dimensions) are almost ubiquitous constituents of materials that comprise the Earth's surface and near-surface regions. They are common in atmospheric dust, they are present as suspended solids in water, and they are abundant in weathered rocks, soils, sediments, and volcanic ash. Nanoparticles are the predominant product of biomineralization reactions and are common in living organisms. The majority of the reactive surface area in the environment may be associated with nanoparticles. Through reactions such as adsorption, precipitation, dissolution, and catalysis on their surfaces, nanoparticles can control the form, distribution, and mobility of both contaminants and nutrients. Nanometer-scale particles are also important technologically, for example as catalysts, quantum-dot electronic devices, ion exchangers, battery materials, and starting materials for chemical syntheses. The aim of this short course is to introduce the concepts of size-dependent properties, processes, and behavior of nanoparticles, and to discuss the implications of phenomena associated with nanoparticles for materials science and earth and environmental science applications. The short course content and presentations will center on topics of common interest to the diversity of researchers interested in nanoscience and the format will foster linkages between researchers in these fields. The short course will be aimed largely at the geoscience community, but it will also be accessible to materials scientists and chemists interested in environmental problems.

Topics and Speakers/Authors

- Nanocrystals in the environment: What are nanocrystals? How they are formed in biological and inorganic processes? How are microstructure development and reactivity size-dependent?
.....*Jillian Banfield (University of Wisconsin Madison)*
- Nanocrystal energetics: Surface energy, thermodynamics, phase stability and metastability, energetic relations amongst phases in micropores and nanomaterials.....
.....*Alexandra Navrotsky (University of California Davis)*
- Nanocrystal morphology and surface reactivity: Mechanisms for control of nanocrystal shape; phase transitions in nanocrystals; Surface characterization of nanocrystals.....
.....*Paul Alivisatos (University of California Berkeley)*
- Clusters in solution and at surfaces: kinetics of formation and dissociation, and isotope exchange. Will introduce general concepts of catalysis and refer to chapter 7 for specific example.....
.....*William Casey (University of California Davis)*
- Molecular modeling: of nanocrystals and surfaces..... *James Rustad (PNNL)*
- Structure and growth: Very small and non-crystalline nanoparticles:- structure and growth.....
.....*Glenn Waychunas (Lawrence Berkeley National Laboratory)*
- Nanoparticles and atmospheric chemistry: Particles in the atmosphere, their mechanisms of formation and composition, sources, growth and effects on climate and visibility; effects on atmospheric composition, health effects, future directions in atmospheric nanoparticle research.....
.....*Cort Anastasio (University of California Davis)*

Welcome New Members

The following individuals joined (or rejoined after a long hiatus) MSA between January 29, 2001 and May 30, 2001. We welcome them to the Society. The areas of interest are: Mineralogy (MI), Crystallography/Crystal Chemistry (CC), Material Properties (PP), Igneous Petrology (IP), Metamorphic Petrology (MP), Sedimentary Petrology (SP), Geochemistry (GE), Phase Equilibria (PE), Economic Geology (EG), Clay Mineralogy (CM), Industrial Mineralogy (IM), Environmental Mineralogy (EM), Gems (GM), Planetary Materials (PM), Teaching (TC), Topologic or Descriptive Mineralogy (TP), Biological-Mineral Interactions (BM), and others as indicated.

If you know of someone who would like or should join MSA, give them the membership application that appears in this issue of *The Lattice*, or is available from either MSA's web site (<http://www.minsocam.org>) or the MSA Business Office, 1015 Eighteenth St NW Ste 601, Washington, D.C. 20036-5212, U.S.A.

Agkhanov, Mr. Atali A., Fersman Mineralogical Museum, Leninskiy Prospect 18-2, Moscow 117071, RUSSIA. Ph: +7 (095) 952-0067. Fax: +7 (095) 952-4850. E-mail: dmz@minmuz.msk.su (12-00).

Allwardt, Mr. Jeffrey R., 2122 Grand Ave Apt S 207, Minneapolis MN 55405-3410. Ph: (612) 874-7320. E-mail: jeffa@msi.umn.edu (12-00). PP,IP,GE,

Alvarado, Mr. Gerald A., 6235 Lorca Dr, San Diego CA 92110-5507. Ph: (619) 229-8637. E-mail: (11-00). MI, IP, MP, SP, EG, GM,PM,

Anderson, Mr. Kevin M., 230 Vicki Lynn Cir, Scott City MO 63780-1432. Ph: (573) 264-2923. E-mail: gneissguy@geologist.com (12-00). IP, MP, EG, GM,

Andreasen, Dr. Jens W., Riso National Laboratory, Frederiksborgvej 399, P.O. 49, Roskilde DK-4000, DENMARK. Ph: +45 4677 4720. Fax: +45 4677 4790. E-mail: jens.wenzel.andreasen@risoe.dk (12-00). MI,CC,PP, PE,IM,

Antignano, Mr. Angelo, 1626 Williston Rd, South Burlington VT 05403-6427. Ph: (802) 658-1181. E-mail: aantigna@zoo.uvm.edu (12-00). IP,GE,PE,

Arthur, Mr. Darrin B., California State Univ-Long Beach, Dept of Geological Sciences, 1250 Bellflower Blvd, Long Beach CA 90840-0000. Ph: (714) 522-0724. E-mail: darthur1@csulb.edu (12-00). CM,

Backhus, Dr. Debera A., 431 S Madison St, Bloomington IN 47403-2450. Ph: (812) 855-0563. Fax: (812) 855-7802. E-mail: dbackhus@indiana.edu (11-00). GE,CM,EM,MS,

Banno, Mr. Hitoshi, 3402 E Lester St, Tucson AZ 85716-3230. Ph: (520) 319-9250. E-mail: hitoshi731@hotmail.com (12-00). MI,IP,GE,PE,PM,

Barschi, Mr. Russell H., 121 W 17th St, New York NY 10011-5436. Ph: (212) 675-6971. Fax: (212) 242-1907. E-mail: rbarschi@msn.com (11-00). MI,CC, PP, EM, GM, PM,

Baylor, Ms. Nicole DeAnn, 2424 Cypress Ave, Norman OK 73072-6844. Ph: (405) 364-4983. E-mail: nbaylor@ou.edu (12-00). MI,EM,GM,

Beal, Ms. Jennifer K., 530 S San Jose Ave Apt B, Covina CA 91723-3179. Ph: (626) 332-7442. E-mail: jennykb76@aol.com (12-00). MI, IP, MP, SP, GE, GM, TC, TP,

Bean, Mrs. Amanda C., 500 N 7th St, Opelika AL 36801-4125. Ph: (334) 741-9317. Fax: (334) 844-6959. E-mail: gibbsac@auburn.edu (12-00). MI, CC, PP, GE, IM, EM,

Bender, Mr. Bradley F., 626 E Catherine St, Chambersburg PA 17201-2702. Ph: (717) 263-1851. E-mail: bfbender@innernet.net (11-00). MI,EG, IM,EM,GM,

Boerst, Mr. Kevin D., Univ of the Witwatersrand, Dept of Geology, P.O. Box WITS 2050,

Johannesburg 2050, SOUTH AFRICA. Ph: +27 (083) 315-0110. E-mail: 065kevin@muse.wits.ac.za (12-00). MI, CC, IP, GE, PE, EG, GM, PM,

Cavosie, Mr. Aaron J., 312 Gene Ave NW, Albuquerque NM 87107-5319. Ph: (505) 980-8739. Fax: (505) 277-8843. E-mail: acavosie@unm.edu (12-00). IP,MP,GE,

Conrad, Ms. Christine F., 6 Rollins St, Poquoson VA 23662-2214. Ph: (757) 868-3901. Fax: (804) 684-7786. E-mail: cfconrad@vims.edu (12-00). GE,EM,

Costa, Dr. Fidel, 1A rue de la Ferrollerie, Orleans F-45071, FRANCE. Ph: +33 (2) 3825



NEW

Handbook of MINERALOGY

Anthony • Bideaux • Bladh • Nichols

NEW - NOW AVAILABLE

Vol. IV Arsenates, Phosphates, Vanadates
680 p., 2000 (ISBN 0-9622097-3-2)

AND STILL AVAILABLE

Vol. I Elements, Sulfides, Sulfosalts
588 p., 1990 (ISBN 0-9622097-0-8)

Vol. II Silica, Silicates in two books
904 p., 1995 (ISBN 0-9622097-1-6)

Vol. III Halides, Hydroxides, Oxides
628 p., 1997 (ISBN 0-9622097-2-4)

"...well established as the definitive
reference work in mineralogy..."
P.J. Dunn, Smithsonian Institution

25% MSA member discount
Use MSA order sheet

\$5 REWARD
paid for each error found
For details visit mineraldata.com

5213. Fax: +33 (2) 3863 6488. E-mail: costaf@cnsr-orleans.fr (11-00). MI,IP,GE,

Cuevas-Miranda, Mr. David N., 4482 Lindell Blvd Apt 401, Saint Louis MO 63108-2444. Ph: (314) 533-0257. E-mail: dcuevas@eas.slu.edu (12-00). MI, CC, PP, IP, MP,GE,

Dauber, Ms. Ingrid J., Univ of Arizona, Dept of Planetary Sci - LPL, 1629 E University Blvd, Tucson AZ 85721-0092. Ph: (520) 621-1507. Fax: (520) 621-4933. E-mail: ingrid@lpl.arizona.edu (12-00). MI, IP, GE, PE, PM, TP,

Detschel, Ms. Marissa J., 6905 Stella Dr W, Whitsett NC 27377-8775. Ph: (336) 446-0427. E-mail: europa2419@yahoo.com (12-00). MI, GE, PM,

Diouf, Dr. Arona, 1A Reservoir Ave Ste 3, Jersey City NJ 07307-1822. Ph: (201) 659-4698. Fax: (201) 659-1322. E-mail: adioufndoffene@netscape.net (11-00). MI, CC, SP, GE, EG, IM, EM, PM, TC, TP, BM,

Dooley, Mr. John H., New Jersey Geological Survey, 29 Arctic Pkwy, PO Box 427, Trenton NJ 08638-0427. Ph: (609) 292-2576. Fax: (609) 633-1004. E-mail: johnd@njgs.dep.state.nj.us (11-00). MI, CC, SP, GE, EG, CM, EM, TP, BM,

Druschel, Mr. Gregory K., Univ of Wisconsin-Madison, Dept of Geology & Geophysics, 1215 W Dayton St, Madison WI 53706-1692. Ph: (608) 262-0915. E-mail: druschel@geology.wisc.edu (12-00). MI, CC, PP, GE, PE, EG, EM, GM, PM, TC, BM, OTHER, GEOMICROBIOLOGY, COMPUTATIONAL CHEMISTRY

El-Shazly, Dr. Aley K., Univ of Tennessee-Martin, Dept of Geol, Geog & Physics, Martin TN 38238-0000. Ph: (901) 587-7437. Fax: (901) 587-7434. E-mail: aelshazly@utm.edu

(11-00). MP,GE,PE,
Elsen, Dr/Prof Jan, Katholieke Univ Leuven, Fysico-Chemische Geologie, Celestijnenlaan 200 C, Heverlee Leuven B-3001, BELGIUM. Ph: +32 (16) 327581. Fax: +32 (16) 327981. E-mail: jan.elsen@geo.kuleuven.ac.be (11-00). MI, CC, PP, IM, TC, TP,

Fechtelkord, Dr. Michael, Universitaet Hannover, Inst fuer Mineralogie, Welfengarten 1, Hannover D-30167, GERMANY. Ph: +49 (511) 762 2896. Fax: +49 (511) 762 3045. E-mail: m.fechtelkord@mineralogie.uni-hannover.de (11-00). MI, CC, PP, CM, OTHER, SOLID STATE NMR SPECTROSCOPY

Field, Dr. Stephen W., Tarleton State Univ, Dept of Chemistry & Geoscience, Box T-0540, Stephenville TX 76402-0000. Ph: (254) 968-9887. E-mail: field@tarleton.edu (11-00). MI,IP,MP,GE,IM,

Fritz, Mr. Eric A., Univ of Oklahoma, Sch of Geology & Geophysics, 100 E Boyd St Ste 810, Norman OK 73019-0000. Ph: (405) 325-6079. Fax: (405) 325-3140. E-mail: efritz@ou.edu (12-00). MI,CC,IP,EG,GM,

Ghandi, Mr. Ahmad, C/O Ambert, Bldg 80 JFK, Rm 116, Jamaica NY 11430-0000. Ph: (877) 572-9818. Fax: (877) 572-9818. E-mail: a.ghandi@pegahnet.com (12-00). MI,

Glasauer, Dr. Susan M., Univ of Guelph, Dept of Microbiology, Guelph ON N1G 2W1, CANADA. Ph: (519) 824-4120 x8904. Fax: (519) 837-1802. E-mail: sglasau@micro.uoguelph.ca (11-00). MI, GE, CM, EM, PM, TC, BM,

Hand, Ms. Victoria L., Univ of Manchester, Dept of Earth Sciences, Williamson Bldg, Oxford Rd, Manchester ENGLAND M13 9PL, UNITED KINGDOM. Ph: +44 (161) 275-6913. E-mail:

victoria.l.hand@stud.man.ac.uk (12-00). GE, EM, BM,

Jackson, Dr. Robert A., Keele University, Leonard-Jones Laboratories, School of Chemistry & Physics, Staffordshire ST5 5BG, UNITED KINGDOM. Ph: +44 (1782) 583042. Fax: +44 (1782) 712378. E-mail: r.a.jackson@chem.keele.ac.uk (11-00). MI,CC,PP,CM,TC,

Johnson, Mrs. Jennifer E., 1808 S Spruce, Mesa AZ 85210-5947. Ph: (480) 491-7764. Fax: (480) 491-7819. E-mail: jej93@worldnet.att.net (12-00). MI,CC,IP,GE,IM,BM,

Kareem, Ms. Keena M., 3522 Marie Dr Apt 3, Baton Rouge LA 70806-5633. Ph: (225) 343-4158. E-mail: kkaree1@lsu.edu (12-00). MI, CC, IP, MP, GE, PE, EM, GM, PM,TC,

Kiczanski, Mr. Timothy J., Stanford University, Geological & Environ Sci Dept, Bldg 320 MC 2115, Stanford CA 94305-2115. Ph: (650) 725-9469. E-mail: tj@pangea.stanford.edu (12-00). CC,PP,

Klein, Mr. Kurt A., California Inst of Technology, Dept of Geological & Planetary Sci, 1200 E California Blvd MC-237, Pasadena CA 91126-0000. Ph: (626) 395-6187. E-mail: kurt@gps.caltech.edu (12-00). MI, PP, IP, SP, PE, EG, EM, GM, TP,

Knorr, Dr. Karsten, University Kiel, Dept Earth Sci, Mineral/Crystal, Olshausenstrasse 40, Kiel D-24098, GERMANY. Ph: +49 (431) 880-2226. Fax: +49 (431) 880-4457. E-mail: knorr@min.uni-kiel.de (11-00). MI,CC,PP,

Korenevski, Dr. Anton A., Univ of Guelph, Dept of Microbiology, Guelph ON N1G 2W1, CANADA. Ph: (519) 824-4120. E-mail: akorenev@micro.uoguelph.ca (11-00). BM,

Korhonen, Ms. Fawna J., 2809 E Minnehaha Pkwy Apt 207, Minneapolis MN 55417-1364. Ph: (612) 721-2330. E-mail: korh0011@tc.umn.edu

(12-00). MI, CC, IP, MP, GE, PE, PM, TC,

Lee, Dr. Alasdair P., Univ of California-Davis, Dept of Land, Air and Water Resources, Davis CA 95616-0000. Ph: (530) 752-2878. Fax: (530) 752-1552. E-mail: alplee@ucdavis.edu (11-00). CC, PP, GE, PE, EM, PM, TC, BM, OTHER, BIOMATERIALS

Li, Dr. Chusi, Indiana University, Dept of Geological Sciences, Bloomington IN 47405-0000. Ph: (812) 855-5404. Fax: (812) 855-7899. E-mail: cli@indiana.edu (11-00). MI,IP,GE,EG,

Liu, Ms. Yang, Univ of Michigan, Dept of Geological Sciences, 2534 C.C. Little Bldg, Ann Arbor MI 48105-1063. Ph: (734) 647-5533. Fax: (734) 763-4690. E-mail: yllzz@umich.edu (12-00).,

Logan, Dr. William S., 1360 Betsy Dr, Charlotte NC 28211-5502. Ph: (704) 367-0341. E-mail: wslogan@carolina.rr.com (11-00). MI,CC,

Lux, Prof. Daniel R., University of Maine, Dept of Geological Sciences, 5790 Bryant Global Sci Ctr, Orono ME 04469-5790. Ph: (207) 581-4494. Fax: (207) 581-2202. E-mail: dlux@maine.edu (11-00). IP,GE,

Martin, Miss Paula, Univ College London, Dept of Geological Sciences, Gower St, London ENGLAND WC1E 6BT, UNITED KINGDOM. Ph: +44 (20) 7679 2577. Fax: +44 (20) 7679 7614. E-mail: paula.martin@ucl.ac.uk (12-00).,

Matsui, Prof. Masanori, Himeji Inst of Technology, Dept of Earth Sciences, Kouto, Kamigoricho, Akogun Hyogo 678-1297, JAPAN. Ph: +81 (791) 580213. Fax: +81 (791) 580216. E-mail: m.matsui@sci.himeji-tech.ac.jp (11-00). MI, CC, PP, GE,PE,PM,

Maurice, Dr. Patricia A., Univ of Notre Dame, Dept of Civil Eng & Geol Sci, 156

Fitzpatrick Hall, Notre Dame IN 46556-0000. Ph: (219) 651-9163. E-mail: pmaurice@nd.edu (11-00). MI, CM, EM, MS, BM,

McKie, Dr. Christine H., Univ of Cambridge, Dept of Earth Sciences, Downing Street, Cambridge ENGLAND CB2 3EQ, UNITED KINGDOM. Ph: +44 (1223) 233494. Fax: +44 (1223) 33450. E-mail: chki@esc.cam.ac.uk (11-00),

Meyer, Dr. Hinrich Wilhelm, Univ of Cambridge, Dept of Earth Sciences, Downing Street, Cambridge ENGLAND CB2 3EQ, UNITED KINGDOM. Ph: +44 (1223) 333373. Fax: +44 (1223) 333450. E-mail: hmeyer@esc.cam.ac.uk (11-00),

Mikouchi, Dr. Takashi, Univ of Tokyo, Dept Earth & Planetary Sci, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, JAPAN. Ph: +81 (3) 5841 4547. Fax: +81 (3) 3816 5714. E-mail: mikouchi@eps.s.u-tokyo.ac.jp (11-00). MI, IP, GE, PE, GM, PM, TC,

Modeland, Mr. Sheldon J., McGill Univ, Dept Earth & Planetary Sci, 3450 University St Rm 238, Montreal QC HEA 2A7, CANADA. Ph: (514) 398-6767. Fax: (514) 398-4680. E-mail: modeland@eps.mcgill.ca (12-00). MI, CC, IP, GE, EG, PM,

Moncrieff, Dr. Duncan H.S., Inst de Sciences de la Terre D'Orleans, 1A rue de la Ferrollerie, Loiret F-45071, FRANCE. Ph: +33 (2) 3825-7868. Fax: +33 (2) 3863-6488. E-mail: duncan@cnsr-orleans.fr (11-00). MI, PP, IP, MP, GE, PE, PM,

Monkawa, Mr. Akiva, Univ of Tokyo, Dept of Earth & Planet Sci, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, JAPAN. Ph: +81 (3) 5306-5098. Fax: +81 (3) 5841-4555. E-mail: monkawa@space.eps.s.u-tokyo.ac.jp (12-00). MI,

Monnar, Mr. Robert D., P.O. Box 8018, Reno NV 89507-8018. Ph: (775) 750-6533. E-mail: webhead007@aol.com (12-00). MI, CC, EG, EM, GM, TP, MS,

Mookherjee, Mr. Mainak, Univ Of Cambridge, Dept of Earth Sciences, Downing Street, Cambridge England CB2 3EQ, UNITED KINGDOM. Ph: +44 (1223) 333 409. Fax: +44 (1223) 333 450. E-mail: mm329@cam.ac.uk (12-00),

Morin, Mr. Louis G., MOR Industrial Co, Box 640, Tarrytown NY 10591-0640. Ph: (914) 631-7891. Fax: (914) 631-7891. E-mail: (11-00),

Neal, Dr. Andrew L., Montana State Univ, Dept of Microbiology, Bozeman MT 59717-0000. Ph: (406) 994-1732. E-mail: andy_n@erc.montana.edu (11-00). MI, GE, BM,

Nobuyoshi, Dr. Miyajima, Univ Bayreuth, Bayerisches Geoinstitut, Bayreuth D-95440, GERMANY. Ph: +49 (921) 553729. Fax: +49 (921) 553769. E-mail: nobuyoshi.miyajima@uni-bayreuth.de (11-00),

Oganov, Mr. Artem R., Univ College London, Dept of Geological Sci, Gower Street, London ENGLAND WC1E 6AR, UNITED KINGDOM. Ph: +44 (20) 7679 3449. Fax: +44 (20) 7387 1612. E-mail: a.oganov@ucl.ac.uk (12-00),

Oze, Mr. Christopher J., Stanford University, Dept of Geol & Envn Sci, Bldg 320 MC 2115, Stanford CA 94305-2115. E-mail: oze@pangea.stanford.edu (12-00). MI, CC, IP, MP, GE, PE, CM, EM,

Patel, Dr. Suresh C., Indian Inst of Technology, Dept of Earth Sciences, Powai, Mumbai 400076, INDIA. E-mail: scpatel@geos.iitb.ac.in (11-00). MP,

Peters, Mr. Stephen C., 2110 Baker Rd, Dexter MI 48130-1541. Ph: (734) 615-4286. E-mail: scpeters@umich.edu (12-00). MI, GE, EG, EM, TC,

Petronis, Mr. Michael S., Univ of New Mexico, Dept of

Earth & Planetary Sci, Albuquerque NM 87131-1116. Ph: (505) 277-4204. Fax: (505) 277-8843. E-mail: mspetro@umn.edu (12-00). IP, MP, GE, OTHER, STRUCTURAL GEOLOGY

Pidgeon, Prof. Robert T., Curtin Univ of Technology, School of Applied Geology, GPO Box U1987, Perth W.A. 6845, AUSTRALIA. Ph: +61 (08) 9266 7979. Fax: +61 (08) 9266 3153. E-mail: tpidgeon@cc.curtin.edu.au (11-00),

Pitra, Dr. Pavel, Universite de Rennes 1, Geosciences Rennes, Bat. 15 - Campus de Beaulieu, Rennes Cedex F-35042, FRANCE. Ph: +33 (2) 99 28 61 79. Fax: +33 (2) 99 28 26 02. E-mail: pavel.pitra@univ-rennes1.fr (11-00). MI, CC, MP, PE, OTHER, STRUCTURAL GEOLOGY, TECTONICS

Plescia, Dr. Paolo, Assing Research Center, Via E. Amaldi 14, Monterondo Rome I-00016, ITALY. Ph: +39 (06) 906 701. Fax: +39 (06) 906 70200. E-mail: plescia@itm.rm.cnr.it (11-00). MI, CC, PP, EM,

Princivalle, Prof. Francesco, Univ of Trieste, Dept of Earth Sciences, Via E. Weiss 8, Trieste I-34127, ITALY. Ph: +39 (40) 676 2208. Fax: +39 (40) 676 2213. E-mail: princiva@univ.trieste.it (11-00),

Rademacher, Ms. Laura K., Univ of California-Santa Barbara, Dept of Geological Sciences, Santa Barbara CA 93106-0000. Ph: (805) 564-5054. E-mail: laura_rademacher@hotmail.com (12-00). GE, EM, TC, BM,

Redmond, Mr. Patrick B., Stanford Univ, Dept of Geol & Envn Sci, Building 320, Stanford CA 94305-0000. Ph: (650) 723-7384. Fax: (650) 725-0979. E-mail: redmond@pangea.stanford.edu (12-00). GE, EG,

Reece, Mr. James J., 32 Lower Park St, Cambridge England CB5 8AR, UNITED

KINGDOM. Ph: +44 (1223) 353 464. E-mail: jree99@esc.cam.ac.uk (12-00),

Reich, Mr. Martin H., Francisco Encina 2745, Lonco Norte, Concepcion, CHILE. Ph: +56 (41) 342217. Fax: +56 (41) 242535. E-mail: mreich@udec.cl (12-00),

Rios, Dr. Susana, Univ of Cambridge, Dept of Earth Sciences, Downing Street, Cambridge ENGLAND CB2 3EQ, UNITED KINGDOM. Ph: +44 (1223) 333432. Fax: +44 (1223) 333450. E-mail: rios@esc.cam.ac.uk (11-00),

Rodehorst, Ms. Uta C., Univ of Cambridge, Dept of Earth Sciences, Downing Street, Cambridge ENGLAND CB2 3EQ, UNITED KINGDOM. Ph: +44 (1223) 333411. Fax: +44 (1223) 333450. E-mail: urod99@esc.cam.ac.uk (11-00),

Rollo, Mr. Andrew, 47 Van Order Dr Apt 5-204, Kingston ON K7M 1B6, CANADA. Ph: (613) 544-1713. E-mail: rollo@students.geol.queensu.ca (12-00). MI, IP, MP, GE, EM, GM,

Romero-Landa, Dr. Javier, Universidad de Sevilla, Dept de Fisica de la Mat Condensada, Avda/reina Mercedes S/N, Sevilla ES-41012, SPAIN. Ph: +34 (954) 550947. Fax: +34 (954) 612097. E-mail: fjromero@cica.es (11-00),

Root, Mr. David B., Univ of California-Santa Barbara, Dept of Geological Sciences, Santa Barbara CA 93106-9630. Ph: (805) 893-7999. Fax: (805) 893-2314. E-mail: dbr@geology.ucsb.edu (12-00). MI, CC, MP, GE, PE, OTHER, ULTRAHIGH PRESSURE MINERALOGY

Rose, Ms. Danielle E., 725 Terra St Apt 22B, Ashland OR 97520-8503. Ph: (541) 488-1352. E-mail: rose0998@students.sou.edu (12-00). MI, IP, PM,

Ruiz, Mr. Hector E., P.O. Box 563, Rolla MO 65402-0563. Ph: (573) 341-4188. E-mail: hruizr@yahoo.com (12-00). PP, PE, CM, IM, GM,

Sandin, Mr. Nils A., 544 Lake St Apt 10, Hancock MI 49930-1934. Ph: (906) 482-5365. E-mail: nasandin@mtu.edu (12-00). MI, CC, IP, MP, SP, GE, PE, CM, EM, MS,

Scandolo, Dr. Sandro, Princeton University, Dept of Chemistry, Princeton NJ 08544-0000. Ph: (609) 258-3236. Fax: (609) 258-6878. E-mail: scandolo@princeton.edu (11-00). MI,

Schauble, Mr. Edwin A., California Inst of Technology, Dept Geological & Planetary Sci, 1200 E California Blvd MC 100-23, Pasadena CA 91125-0000. Ph: (626) 395-6590. Fax: (626) 683-0621. E-mail: edwin@gps.caltech.edu (12-00). CC,GE,EM,

Schlegel, Dr. Michel L., Univ of Colorado, Dept of Geological Sciences, 399 UCB, Boulder CO 80309-0399. Ph: (303) 442-0237. Fax: (303) 492-2606. E-mail: michel.schlegel@colorado.edu (11-00). MI, CC, PP, GE, CM, IM,EM,PM,MS,

Schmitt, Dr. Axel K., Univ of California-Los Angeles, Dept Earth & Space Sciences, 595 Charles Young Dr E-Geol Bldg 2655, Los Angeles CA 90095-1567. Ph: (310) 794-5047. Fax: (310) 825-2770. E-mail: axel.argon.ess.ucla.edu (11-00). IP, GE, PE, EG, EM,

Schoenau, Ms. Kristin A., Univ of Cambridge, Dept of Earth Sciences, Downing St, Cambridge England CB2 3EQ, UNITED KINGDOM. Ph: +44 (1223) 333411. Fax: +44 (1223) 333450. E-mail: kristin.schoenau@gmx.de (12-00).,

Shaw, Dr. Samuel, Stanford Univ, Dept of Geol & Env Sci, Braun Hall Bldg 320, 450 Sierra Mall, Stanford CA 94305-2115. Ph: (650) 725-0580. Fax: (650) 725-0979. E-mail: sshaw@pangea.stanford.edu (11-00). MI, CC, GE, EM, OTHER, SYNCHROTRON TECHNIQUES

Shchekina, Dr. Tatyana I., Moscow State Univ, Dept of Petrology, Faculty of Geology,

Moscow 119899, RUSSIA. Ph: +7 (095) 939 2040. Fax: +7 (095) 932 8889. E-mail: tishchek@geol.msu.ru (12-00).,

Sondergeld, Dr. Peter, Univ Wien, Inst Fur Exp Physik, Strudlhofgasse 4, Wien A-1090, AUSTRIA. Ph: +43 (1) 4277 51777. Fax: +43 (1) 4277 9511. E-mail: peso@lisa.exp.univie.ac.at (11-00).,

Spandler, Mr. Carl J., Australian National Univ, Dept of Geology, Canberra 200, AUSTRALIA. Ph: +61 (2) 6249-2066. Fax: +61 (2) 6249-5544. E-mail: carl@geology.anu.edu.au (12-00). MI, IP, MP, GE, PE, EG,

Srithai, Ms. Boontarika A., Univ College London, Dept of Geological Sci, Gower Street, London England WC1E 6BT, UNITED KINGDOM. Ph: +44 (20) 7504 2828. Fax: +44 (20) 7388 7614. E-mail: b.srithai@ucl.ac.uk (12-00).,

Stimpfl, Ms. Marilena, 645 W Orange Grove #1038, Tucson AZ 85704-0000. Ph: (520) 621-6006. E-mail: mstimpfl@geo.arizona.edu (12-00). MI, CC, PP, MP, GE, IM, EM, TC,

Storm, Ms. Lara C., 2363 Burdett Ave, Troy NY 12180-2408. Ph: (518) 274-9844. E-mail: storml@rpi.edu (12-00). MP,GE,PE,

Street, Dr. John, Univ of Cambridge, Dept of Earth Sciences, Downing Street, Cambridge England CB2 3EQ, UNITED KINGDOM. Ph: +44 (1223) 333 411. Fax: +44 (1223) 333 450. E-mail: jstr99@esc.cam.ac.uk (11-00).,

Tarantino, Ms. Serena Chiara, Univ di Pavia, Dipt di Scienze della Terra, Via Ferrata 1, Pavia I-27100, ITALY. Ph: +39 382505842. Fax: +39 382505890. E-mail: tarantino@crystal.unipv.it (12-00).,

Topansari, Mr. Irwan, Hasanuddin University, Jalan Perintis Kemerdekaan Km. 13, Lr. 3/20A, Makassar South Sulawesi 90 243, INDONESIA. Ph: +62 (441) 589061. E-mail:

casaid@yahoo.com (12-00). MI,MP,SP,EM,GM,TP,

Tsuchiya, Prof. Akira, Osaka University, Dept Earth and Space Sci, 1-1 Machikaneyama-cho, Toyonaka 560-0043, JAPAN. Ph: +81 (6) 6850-5800. Fax: +81 (6) 6850-5480. E-mail: akira@ess.sci.osaka-u.ac.jp (11-00). MI, CC, PP, IP, MP, GE, PE, EM, GM, PM, BM,

Vesper, Ms. Dorothy J., Pennsylvania State Univ, Dept of Geosciences, 437 Deike Bldg, University Park PA 16802-0000. Ph: (814) 861-7401. E-mail: vesper.d@geosc.psu.edu (12-00). MI, GE, CM, EM,

Vymazalova, Ms. Anna, Charles University, Inst Geochem, Min & Nat Res, Albertov 6, Prague 2 123 48, CZECH REPUBLIC. Ph: +420 (2) 6035 53426. Fax: +420 (2) 2431 6826. E-mail: anvym@prfdec.natur.cuni.cz (12-00).,

Walsh, Mrs. Emily O., Univ of California-Santa Barbara, Dept of Geological Sciences, Santa Barbara CA 93106-0000. Ph: (805) 893-7999. Fax: (805) 893-2314. E-mail: emily@geol.ucsb.edu (12-00). MI, MP, GE, PE, GM, PM,

Wang, Dr. Lumin, Univ of Michigan, Nuclear Engr & Rad Science, 2355 Bonisteel Blvd, Cooley Bldg, Ann Arbor MI 48109-2104. Ph: (734) 647-8530. Fax: (734) 647-8531. E-mail: lmwang@umich.edu (11-00). CC,PP,CM,EM,MS,

Weaver, Ms. Karrie, Univ of California-Berkeley, Dept of Earth & Planet Sci, 307 McCone Hall MC 4767, Berkeley CA 94720-4767. Ph: (510) 642-9116. Fax: (510) 643-9980. E-mail: kweaver@uclink4.berkeley.edu (12-00). MI,IP,MP,GE,PM,TC,

Weiss, Mr. Benjamin P., California Inst of Technology, Dept of Geological & Planetary Sci, 1200 E California Blvd MC 170-25, Pasadena CA 91125-0000. Ph: (626) 395-6187. Fax: (626) 568-0935. E-mail: bweiss@gps.caltech.edu (12-00). PM,

BM,
Werner, Ms. Cindy A., Pennsylvania State Univ, Dept of Geosciences, 540 Deike Bldg, University Park PA 16802-0000. Ph: (814) 863-8055. Fax: (814) 863-8094. E-mail: werner@geosc.psu.edu (12-00). IP, GE, EG, BM,

Wilke, Dr. Max, Universitaet Potsdam, Inst fuer Geowissenschaften, Postfach 601553, Potsdam D-14415, GERMANY. Ph: +49 (331) 977 5409. Fax: +49 (331) 977 5060. E-mail: max@geo.uni-potsdam.de (11-00). MI, IP, MP, GE, OTHER, SPECTROSCOPY

Williams, Mr. Stephen J., 940 W Lovell St Apt 2, Kalamazoo MI 49007-4562. E-mail: bullwinkle_78@hotmail.com (12-00). PP, EG, EM, TC,

Wray, Dr. William B., 2530 Creek Dr, Park City UT 84060-6866. Ph: (435) 649-0411. Fax: (435) 649-1263. E-mail: bwray@xmission.com (11-00). MI, CC, IP, MP,GE,EG,

Yogev, Ms. Dina, The Hebrew Univ of Jerusalem, Inst of Chemistry, Jerusalem IL-91904, ISRAEL. Ph: +972 (2) 658-5698. Fax: +972 (2) 652-0099. E-mail: dina.yogev@huji.ac.il (12-00). MI,CC,PP,

Yu, Dr. Ping, Univ of California-Davis, Dept of Land, Air & Water Resources, 1 Shields Ave, Davis CA 95616-0000. Ph: (530) 752-2878. Fax: (530) 752-1552. E-mail: pyu@ucdavis.edu (11-00). MI, CC, PP, GE, CM, IM, EM, PM, BM,

Zach, Mr. Michael P., 1401 Palo Verde Rd, Irvine CA 92612-4314. Ph: (949) 824-2612. Fax: (949) 824-3168. E-mail: mzach@uci.edu (12-00). CC, PP, EM, GM, TC, BM, OTHER, GEOLOGICAL METHODS FOR MATERIALS SYNTHESIS

Zema, Dr. Michele, Univ di Pavia, Ctr Grandi Strumenti, Via Bassi 21, Pavia I-27100, ITALY. Ph: +39 (382) 507531. Fax: +39 (382) 422251. E-mail: michele@elicon.unipv.it (11-00).,

IMA, Continued from page 10

they are not minerals.

The “50-percent rule” or its equivalent at smaller divisions is a keystone of the IMA classifications. The concept is unequivocal and scientifically precise. A problem arises, however, where the extremes of a two-member series are too far apart; that is, they are too unlike one another. To offer an example, let me return to the orthopyroxenes. Imagine a suite of amphibolites with phases that fall between En₅₅ and En₄₈. This is a small range of composition, yet some of the pyroxenes would be called enstatite, and the remainder ferrosilite, two minerals quite dissimilar optically, genetically, and in appearance. In short, two orthopyroxenes that differ but ever so slightly (for example En_{50.2} vs. En_{49.9}) would receive wholly disparate names. Prior to the IMA assault, the two pyroxenes would have been, respectively, hypersthene and ferrohypersthene. The image there is clear: two similar orthopyroxenes of intermediate composition, one slightly more Fe-rich than the other.

Finally, will the zealots of classification newspeak next attack the plagioclase series? Are the four members that straddle the long gap between albite and anorthite to be banished? Will quartz diorite now carry “calcic albite” (andesine)? Will gabbro carry “sodic anorthite” (labradorite)? The possibilities are downright discouraging.

REFERENCES

- Leake, B. E. (compiler) (1978) Nomenclature of amphiboles. *American Mineralogist*, 63, 1023-1052.
- Leake, B. E. (and 21 others) (1997) Nomenclature of amphiboles: Report of the Subcommittee on Amphiboles of the International Mineralogical Association, Commission on New Minerals and Mineral Names. *American Mineralogist*, 82, 1019-1037.
- Morimoto, N. (and 8 others) (1988) Nomenclature of pyroxenes. *American Mineralogist*, 73, 1123-1133.
- Steckelisen, A. (1967) Classification and nomenclature of igneous rocks. *Neus Jahrbuch für Mineralogie*, 107, 144-240.

Melts, Continued from page 1

surements and more sophisticated geophysical and experimental techniques. These data reveal a complexity in crustal and mantle processes that has yet to be fully exposed to and appreciated by the Earth Science community.

The conveners plan a half-day in which invited speakers, including Sandy Cruden, Phil England, Nick Petford, Ernie Rutter, Ed Sawyer and Christian Teyssier, will present not only current research but also their vision of the future direction of research to understand crust-mantle interactions and crust-mantle evolution. In this symposium and Topical Session, the focus is on the following topics: the role of the mantle in a geochemically evolving lithosphere; the dynamics of partial melting in the continental crust and upper mantle; relationships between the grain-scale distribution of melt and the geochemical and physical properties of partially molten rocks; the specific links between petrologic and structural response to melt transport and accumulation; and kinematic and dynamic expressions of partial melt distribution on the orogenic scale. We will consider how the presence or influence of melt can be detected from the outcrop to the plate scale. How can outcrop/hand-specimen scale observations be used to provide links between laboratory/theoretical studies and large-scale geophysical observations?

Poster or Oral contributions are invited for the Topical Ses-

All About Submissions, Continued from page 6

or changes of addresses. Once the paper is in the “pre-accept” or accept stage, please make sure the editorial office has your current complete contact information or alternate e-mail, or whatever is necessary to reach you.

FUTURE PLANS

Over the summer of 2001, we are going to experiment more with sending the materials to the associate editors via e-mail instead of regular mail. And we are learning about web-based peer review systems to see what is available, and affordable, for our situation. In a web-based system, authors fill out a few boxes online, then upload their manuscript, approve it, and that’s it. Each author would be given an identifying number or password or some sort so that with subsequent submissions, many of the online boxes are already completed. For example, once you enter your address the computer can enter it in subsequent submissions, merely giving you the option to update it.

And associate editors and reviewers can print out the documents directly from the web – no mail costs, no time delays! Reviewers will fill out the reviewer form directly on their page of the web site. The editors will have all the information at their fingertips, and the associate editors will not need to record dates, remember to bundle everything up, or mail anything back to us.

I am exploring these options and many, many more by contacting several companies and providers. If you have experience as authors, reviewers, or associate editors with other journals who are already using a web-based system, please send me any and all feedback about what works and what has been very helpful.

In the meantime, put 3 copies and a cover letter into an envelope and mail it to the Washington office! I look forward to getting a lot of new manuscripts!

sion (T5). Further information on the session and submission information can be found on the web site for the meeting at <http://www.geosociety.org/meetings/2001/techprog.htm>.

A post-meeting field trip is planned for November 8–11, 2001, on “Deformation, Metamorphism, and Granite Ascent in Western Maine” to be led by Gary Solar, Mike Brown, and° Paul Tomascak. The contact person for this field trip is Gary Solar, Dept. of Earth Sciences, State University of New York, College at Buffalo, Buffalo, NY 14222; Tel: (716) 878-4900. The cost is \$350 and registration is limited to 33. More information can be found at the following website: <http://www.geosociety.org/meetings/2001/t-ftrip.htm>.

Get your *new*
RiMGs!

President's column, Continued from page 3

lications in the Geosciences was available at the time. I am told that the course was very successful and on behalf of MSA I thank Randy and Jim for their major efforts to make this success possible.

There was also a workshop entitled "Calculating Metamorphic Phase Equilibria," prior to the Goldschmidt Conference, held on the campus of Virginia Tech in Blacksburg, Virginia. The workshop was taught jointly by Roger Powell, University of Melbourne and Chris Carson, Yale University. It was convened by Michael Brown, University of Maryland and Bob Tracy, Virginia Tech. Thirty two scientists attended and I heard that it was very successful. MSA is most grateful to the conveners and lecturers for having made this possible.

And now some comments on two issues that were taken up at the second **MSA 2001 Council** meeting (held on the Saturday prior to the Goldschmidt Conference) and which are probably of considerable interest to the MSA membership. The first issue is that of future spring meetings (in addition to the well-established association of MSA with the American Geophysical Union's annual spring meeting and the Geological Society of America's annual fall meeting). Over the prior several months much attention was given to this by MSA's meeting coordinator, Peter Heaney. MSA council in consultation with Peter developed the following tentative plan for co-sponsorship by MSA of the following spring meeting schedule:

Spring 2002: A joint AGU-MSA meeting in Washington, D.C. (May 28-June 1) because co-sponsorship with the Goldschmidt Conference would take us to Davos, Switzerland in August 17-23, which is just a week prior to the IMA meeting in Edinburgh, UK (September 1-6, 2002). The MSA Council meeting will take place at the Washington AGU meeting and the presentation of the Dana Medal 2002 will take place there as well. The Council has decided that MSA will be one of the co-sponsors of the IMA meetings and I understand from Ian Parsons, Vice President of IMA and chairman of the organizing committee, that quite a few MSA members have already been asked to convene scientific sessions there. The draft technical program for these meetings is beginning to firm up.

Spring 2003: Although MSA would have been most interested in being a co-sponsor with the Goldschmidt Conference once more, the Goldschmidt Conference for 2003 is planned for Kurashiki, Japan for September 7-12. The AGU meeting is planned for Nice, France, April 7-11, 2003. In view of both organizations having their meetings overseas, the council recommended that MSA approach the Clay Mineral Society in the hope of MSA co-sponsorship of their spring meeting planned for June 7-11, in Athens, Georgia. This proposal is presently under consideration by the Clay Mineral Society.

Spring, 2004: Although this is now three years away, MSA Council decided to express its strong interest in possible co-sponsorship with the Geochemical Society (and other societies) of the Goldschmidt Conference planned for Copenhagen, Denmark in late May, 2004. This possible joint meeting venture will be considered by the Goldschmidt Committee as well as the Geochemical Society.

Continued on page 23

THE MOST COMPREHENSIVE PHOTO CD!

Photographic Guide to Mineral Species

An astounding 5400 never-before-published photographs depicting 3100 different mineral species are pictured in in this remarkable CD, four times the number of different minerals seen in any other product! Completely hyperlinked among species names, localities and associations, this outstanding photographic record captures many of the rarely-seen, frequently-overlooked phases in the mineral kingdom. An invaluable teaching aid and reference work, this multi-featured, dual platform CD includes Netscape Communicator 4.5 and will operate in both Windows and Mac operating systems! Only **\$69.95 plus \$5.00** surface shipping.

THE FINEST NEW BOOKS!

LOVOZERO - by Dr. Igor Pekov - A comprehensive study of the history, geology and mineralogy of this prolific area of the Kola Peninsula, with over 500 pages and fully illustrated with hundreds of color and b/w photos, maps and drawings. Hardcover volume, superbly done, just **\$79.00 plus \$8.00** for surface mail. Exclusively from Excalibur!

LANGBAN - The Mines, Minerals, Geology & Explorers

Ed. by Holtsdam and Langhof - A superb 215+ page hardcover book printed on exquisite heavy stock that tells the complete story of this prolific Swedish mineral locality. Filled with excellent color photos as well as black and white images of the rich mineralogy and history of this famous area, this book is a long-awaited masterpiece of regional mineralogy that every library should have! Full descriptive mineralogy of the hundreds of species that occur there, coupled with a marvelous historical treatment make this an instant classic! Large format (30x22cm), superb printing quality @ **\$75.00 plus \$7.00** surface shipping

THE BEST DATABASE! - NOW on CD!

The Fersman Museum Mineral Database

This excellent software product is a comprehensive database of all approved mineral species. Information for each mineral includes chemistry, mineral group, X-ray data and space group, optical data, other physical properties as well as type locality and literature references! *Most importantly, every field or combination of fields is fully searchable!* This DOS-based program works well in any Windows environment with an IBM-compatible system. We have prepared a full installation package and instruction guide for our clients, and this excellent software package is just **\$99.00 plus \$5.00** surface shipping.

Use your Visa, MasterCard, or American Express card. Institutional purchase orders accepted via fax. Order these fine products exclusively from:

Excalibur Mineral Company
 1000 North Division Street - Peekskill, NY 10566
 Tel: (914) 739-1134 - Fax: (914) 739-1257
 EMail: order@excaliburmineral.com
 Website: www.excaliburmineral.com

Mineralogical Society of America

Publications Price List and Order Form

Reviews in Mineralogy and Geochemistry
(25% member discount)

- ___ v. 08: Kinetics of Geochemical Processes (1981) **\$20**
- ___ v. 9A: Amphiboles and Other Hydrous Pyriboles - Mineralogy (1981) **\$20**
- ___ v. 9B: Amphiboles: Petrology and Experimental - Phase Relations (1982) **\$20**
- ___ v. 10: Characterization of Metamorphism through Mineral Equilibria (1982) **\$20**
- ___ v. 11: Carbonates: Mineralogy & Chemistry (1983) **\$24**
- ___ v. 12: Fluid Inclusions (1984) **\$32**
- ___ v. 13: Micas (1984) **\$28**
- ___ v. 14: Microscopic to Macroscopic: Atomic Environments to Mineral Thermodynamics (1985) **\$20**
- ___ v. 15: Mathematical Crystallography (rev.) (1990) **\$24**
- ___ v. 16: Stable Isotopes in High Temperature Geological Processes (1986) **\$24**
- ___ v. 17: Thermodynamic Modeling of Geological Materials: Minerals, Fluids, Melts (1987) **\$28**
- ___ v. 18: Spectroscopic Methods in Mineralogy and Geology (1988) **\$28**
- ___ v. 19: Hydrous Phyllosilicates (Exclusive of Micas) (1988) **\$28**
- ___ v. 20: Modern Powder Diffraction (1989) **\$28**
- ___ v. 21: Geochemistry and Mineralogy of Rare Earth Elements (1989) **\$28**
- ___ v. 22: The Al₂SiO₅ Polymorphs (1990) **\$24**
- ___ v. 23: Mineral-Water Interface Geochemistry (1990) **\$36**
- ___ v. 24: Modern Methods of Igneous Petrology (1990) **\$24**
- ___ v. 25: Oxide Minerals: Petrologic and Magnetic Significance (1991) **\$28**
- ___ v. 26: Contact Metamorphism (1991) **\$32**
- ___ v. 27: Minerals and Reactions at the Atomic Scale: Transmission Electron Microscopy (1992) **\$28**
- ___ v. 28: Health Effects of Mineral Dusts (1993) **\$32**
- ___ v. 29: Silica: Physical Behavior, Geochemistry and Materials Applications (1994) **\$32**
- ___ v. 30: Volatiles in Magmas (1994) **\$30**
- ___ v. 31: Chemical Weathering Silicate Minerals (1995) **\$32**
- ___ v. 32: Silicate Melts (1995) **\$30**
- ___ v. 33: Boron (1996) **\$32**
- ___ v. 34: Reactive Transport in Porous Media (1996) **\$32**
- ___ v. 35: Geomicrobiology (1997) **\$32**
- ___ v. 36: Planetary Materials (1998) **\$40**
- ___ v. 37: Ultra-High Pressure Mineralogy (1998) **\$32**
- ___ v. 38: U Minerals & Chemistry (1999) **\$32**

- ___ v. 39: Mineral Transformation Processes (2000) **\$32**
- ___ v. 40: Sulfate Minerals (2000) **\$32**
- ___ v. 41: High T & P Crystal Chemistry (2001) **\$36**
- ___ v. 42: Molecular Modeling (2001) **\$32**

Monographs (25% member discount)

- ___ Crystallography & Crystal Chemistry, F. D. Bloss **\$32**
- ___ v. 1: Metamorphic Phase Equilibria, Spear **\$60**
- ___ v. 2: Crystal Structures v. 1, O'Keeffe & Hyde **\$36**
- ___ v. 3: Teaching Mineralogy **\$28**
- ___ v. 4: Bowen, D.A. Young **\$16**
- ___ v. 5: Optical Crystallography, F. D. Bloss **\$32**

Handbook of Mineralogy (25% member discount, except shipping)

- ___ v. I: Elements, Sulfides, Sulfosalts... **\$94+\$11** shipping
- ___ v. II: Silica, Silicates (two books) **\$144+\$20** shipping
- ___ v. III: Halides, Hydroxides, Oxides **\$100+\$11** shipping
- ___ v. IV: Arsenates, Phosphates, Vanadates **\$108+\$11** shipping

European Mineralogical Union Notes (25% member discount)

- ___ v. 1: Modular Aspects of Mineral (1997) **\$24**
- ___ v. 2: Environmental Mineralogy (2000) **\$24**
- ___ v. 3: Mixing in Silicate and Oxide Systems (2001) **\$24**

Mineralogical Society Series (25% member discount)

- ___ v. 2: High-Temp. Metamorphism (1990) **\$168**
- ___ v. 3: Stability of Minerals (1993) **\$210**
- ___ v. 4: Clay-Pore Fluid Interactions (1993) **\$230**
- ___ v. 5: Mineral Surfaces (1994) **\$74**
- ___ v. 6: Microprobe Techniques (1994) **\$83**
- ___ v. 7: Rare Earth Minerals (1995) **\$74**
- ___ v. 8: Deformation-Enhanced Fluid Flow (1997) **\$122**

Other Publications (no member discount)

- ___ Fifth International Kimberlite Conference Proceedings **\$45**
- shipping: U.S. -**\$4**/set, Canada -**\$16**/set, Elsewhere-**\$20**/set.
- ___ Centennial History Geological Society of Washington **\$10**
- ___ MSA Membership Directory (MSA members only) **\$15**

American Mineralogist - back and single issues

For volumes 1-80, contact Periodicals Service Company, 11 Main St., Germantown, NY 12526 USA. (518) 537-4700

Vol.	member	non-member
81-85	\$5/issue, \$30/volume	\$55/issue, \$430/volume
volume: _____	issue # _____	price _____
volume: _____	issue # _____	price _____

Shipping: Please add the following amounts for postage to book orders for which shipping is not indicated. Shipping is by surface mail that may take up to 4 months to some destinations. Contact the MSA Business Office for shipping rates by air mail, United Parcel Service, Federal Express, or other express service.

To Order: Indicate quantity, shipping, and cost information. MSA, CMS, and GS Members may take the 25% discount where noted. Prepay orders under \$300. Publications may not be returned for refund or credit. Send entire form to: Mineralogical Society of America, 1015 18th Street NW Ste 601, Washington, DC 20036-5212 USA. Phone: (202) 775-4344; Fax: (202) 775-0018 E-mail: business@minsocam.org Website: <http://www.minsocam.org>

Name: _____
Address: _____

City: _____ State: _____ Zip: _____
Country: _____ Postal Code: _____

Payment: check in US\$ drawn on a US bank, money order, UNESCO coupons, or credit card: [] Visa [] MasterCard [] Diners Club [] American Express

Card #: _____ Exp Date: _____

Signature: _____

Print name as it appears on card: _____

# of books	Shipping cost (per book)		
	US	Canada	other
1	\$2.50	\$6.50	\$8.00
2	\$1.75	\$7.00	\$9.00
3 to 4	\$1.00	\$5.00	\$7.00
5 to 7	\$1.00	\$4.00	\$5.00
8 or more	\$1.00	\$3.00	\$4.00

A. member discount books	
B. less 25% member discount (A x 0.25)	
C. nondiscounted items	
D. shipping	
Total (A-B+C+D)	

Mineralogical Society of America Membership Application

To join the MSA, please send a copy of this application, along with the required payments for dues and subscriptions, to the Mineralogical Society of America, 1015 Eighteenth St NW Ste 601, Washington DC 20036-5274, USA phone: (202) 775-4344; fax: (202) 775-0018; e-mail: business@minsocam.org; website: www.minsocam.org

Membership Category Requested: Member Student Member Life Member

Address Information:

Dr. Name: _____ Phone _____
 Prof First Middle Last
 Mr. Address: _____ Fax _____
 Ms. _____ E-mail _____
 Mrs. _____
 Other: _____ Birth date _____

Areas of Interest: (Check as many as apply) Mineralogy (MI), Crystallography/Crystal Chemistry (CC), Material Properties (PP), Igneous Petrology (IP), Metamorphic Petrology (MP), Sedimentary Petrology (SP), Geochemistry (GE), Phase Equilibria (PE), Economic Geology (EG), Clay Mineralogy (CM), Industrial Mineralogy (IM), Environmental Mineralogy (EM), Gems GM, Planetary Materials (PM), Teaching (TC), Descriptive (Topologic) Mineralogy (TP), Mineral Surfaces (MS), Biological-Mineral Interactions (BM), Others (Please indicate) _____

Professional Information:

Highest Degree earned: Doctorate Masters Bachelors No College Degree
 Institution at which Highest Degree was earned _____ Year _____
 Location _____
 Employer _____ Job Title _____
 Job Function(s): _____
 What other professional societies do you belong to? _____

Student Certification: (Applicants for student membership must supply the following information.)

Institution _____ Location _____
 Degree sought _____ Expected completion date _____
 A faculty member who can verify your student status:
 Name _____ E-mail _____

2001 Fee Schedule

Memberships are entered and renewed on a calendar basis. You will receive all publications for the year you join. Membership applications received after October 1 will be made effective January 1 of the following year unless otherwise requested. Members will receive the newsletter, *The Lattice*, as part of their dues. As an additional benefit, members may elect to receive the *American Mineralogist*, as well as some related publications, at substantially reduced rates. Please indicate all options that apply in the box to the right. Members are entitled to a 25% discount on other MSA publications given on our Publication List.

Member Dues	US\$50.00
Student Member Dues	5.00
<i>American Mineralogist</i> (member price)	30.00
<i>American Mineralogist</i> (student member price)	25.00
International airlift for <i>American Mineralogist</i>	40.00
Life Membership Dues (with <i>American Mineralogist</i>)	2000.00
<i>Mineralogical Abstracts</i> , published quarterly by the Mineralogical Society of Great Britain & Ireland	55.00
<i>Physics and Chemistry of Minerals</i> , published eight times a year by Springer-Verlag	475.00
<i>Journal of Petrology</i> , published twelve times a year by Oxford University Press	375.00
<i>Rocks & Minerals</i> published 6 times a year by Heldref Foundation \$36.00 (\$46.00 for non-US addresses)	
TOTAL	

Payment: Payment can be made by money order or check in US dollars drawn on a US bank and payable to the Mineralogical Society of America. US\$ _____ enclosed or charge my: Mastercard Visa Diners Club American Express credit card
 Card # _____ Exp. Date: _____
 Cardholder: _____ Signature: _____

Meeting Calendar 2001

JULY

21–26 American Crystallographic Association Annual Meeting. Details: Duncan McRee, Program Chair, Dept. of Molecular Biology MB4, Scripps Research Inst., 10666 N. Torrey Pines Rd., La Jolla CA 92037. Ph: (619) 784-9235, Fax: (619) 784-2857. Email: dem@scripps.edu. Web: <http://www.hwi.buffalo.edu/ACA/ACA-Annual/LosAngeles/LosAngeles.html>.

July 29–August 4, 2001 12th International Clay Conference. Bahia Blanca – Argentina. Details: Dr. Fernanda Cravero, Departamento de Geología. Universidad Nacional del Sur. San Juan 670. 8000 Bahía Blanca. Argentina. Ph. 54-291-4595101 ext. 3041 Fax. 54-291-4595148. Email: 12icc@criba.edu.ar. Web page: <http://www.12icc.criba.edu.ar/>.

AUGUST

25–31 20th European Crystallographic Meeting (ECM 20). Krakow, Poland. E-mail: ECM2001@chemia.uj.edu.pl. Web: <http://www.ch.uj.edu.pl/ECM2001.htm>.

26–31 6th Biennial SGA Meeting. Krakow, Poland. Details: Wojciech Mayer, University of Mining and Metallurgy, Faculty of Geology, Geophysics and Environmental Protection, av. Mickiewicza 30, 30-059 Krakow, Poland. Tel. 48-12-6172385, Fax: 48-12-

63332936. Email: wmayer@geol.agl.edu.pl. Web page: <http://galaxy.uci.agh.edu.pl/~sga>.

26–30 Geochemistry Division, American Chemical Society 222nd National Meeting. Chicago, Illinois, USA. Details: Peggy A. O'Day, Arizona State University. Email: oday@asu.edu. Web page: <http://membership.acs.org/G/GEOC/>.

SEPTEMBER

1–7 Sixth International Eclogite Conference in Japan. Niihama, Ehime Prefecture, Japan. Details: Masaki Enami, Department of Earth and Planetary Sciences, Graduate School of Science, Nagoya University, Nagoy 464-8602, Japan. Tel: +81-52-789-3005. Email: iec2001@ganko.eps.nagoya-u.ac.jp. Web page: <http://migmatite.eps.nagoya-u.ac.jp/iec2001/>.

6–8 CL 2001 Cathodoluminescence in Geosciences: New insights from CL in combination with other techniques. Freiburg, Germany. Details: CL2001 Secretariat, Freiberg Univ. of Mining and Technology, Dept. of Mineralogy, Brennhaushausgasse 14, D-09596 Freiberg, Germany; Tel: 49-0-3731-392628; Fax: 49-0-3731-393129. E-mail: goetze@mineral.tu-freiberg.de; Web: www.mineral.tu-freiberg.de/techmin/cl2001_2z.html.

10–14 64th meeting of the Meteoritical Society.

Rome, Vatican City. Details: Guy Consolmagno SJ, Specola Vaticana, V-00120, Vatican City State. E-mail: gjc@specola.va OR Vatican Observatory Research Group, Steward Observatory, University of Arizona, Tucson, Arizona 85721, USA. E-mail: gjc@as.arizona.edu. Web page: <http://www.uark.edu/campus-resources/metsoc/meeting.htm>.

15–20 The Deep Earth: Theory, Experiment and Observation: Mantle Processes. Porto, Portugal. Details: Dr. Josip Hende-kovic. Phone: +33 388 76 71 35, fax: +33 388 36 69 87. Email: euresco@esf.org. Web: <http://www.esf.org/euresco/01/lc01125a.htm>

24–28 4th International Archaean Symposium (4IAS). Perth, Western Australia. Details: Dr Susan Ho, Secretary, 4th International Archaean Symposium, PO Box 80, Bullcreek WA 6149, Australia. E-mail: susanho@geol.uwa.edu.au. Telephone: (61 8) 9332 7350 (international) (08) 9332 7350 (Australia). Fax: (61 8) 9310 6694 (international) (08) 9310 6694 (Australia). Web page: <http://redback.geol.uwa.edu.au/~ias/>.

24–26 MinPet 2001: Centenary Meeting of the Austrian Mineralogical Society. Vienna, Austria. Details: MinPet 2001 Institute of Petrology, University of Vienna. Geozentrum, Althanstrasse 14, A-1090 Wien. E-mail: Mineralogie@univie.ac.at. Web page: <http://www.univie.ac.at/Mineralogie/minpet01.htm>.

[univie.ac.at/Mineralogie/minpet01.htm](http://www.univie.ac.at/Mineralogie/minpet01.htm).

NOVEMBER

5–8 Geological Society of America Annual Meeting. Boston, MA USA. Details: GSA Meetings, Box 914, Boulder, Colo. 80301-9140. Tel. (303) 447-2020 or 1-800-472-1988; Fax: 303-447-0648. E-mail: meetings@geosociety.org. Web page: www.geosociety.org/meetings/2001/index.htm.

26–30 Materials Research Society Fall Meeting. Boston, MA. Details: Materials Research Society, 506 Keystone Drive, PA 15086-7573, USA. Telephone: 724-779-3003. Fax: 724-779-8313. E-mail: info@mrs.org. Web page: <http://www.mrs.org/meetings/fall2001/>.

DECEMBER

10–14, 2001 American Geophysical Union Fall Meeting. San Francisco, California. Details: AGU Meetings Department, 2000 Florida Avenue, NW, Washington, DC 20009. Phone: 1-800-966-2481. Fax: +1-202-328-0566. E-mail: meetinginfo@agu.org. Web page: <http://www.agu.org/meetings/fm01top.html>.

2002

APRIL

1–5 2002 Materials Research Society Spring Meeting. San Francisco, California, USA. Details: Materials Research Society,

506 Keystone Drive, PA 15086-7573, USA. Telephone: 724-779-3003. Fax: 724-779-8313. E-mail: info@mrs.org. Web page: <http://www.mrs.org/meetings/spring 2002/>

MAY

May 28–June 1 AGU 2002 Spring Meeting, Washington, DC. Details: AGU Meetings Department, 2000 Florida Avenue, NW, Washington, DC 20009. Phone: 1-800-966-2481. Fax: 1-202-328-0566. E-mail: meetinginfo@agu.org.

AUGUST

17–23 August 2002. 12th V.M. Goldschmidt Conference. Davos, Switzerland. Details: Prof. A. Halliday, Institut für Min. und Petrographie, ETH-Zentrum, CH-8092, Zurich. E-mail: halliday@erdw.ethz.ch

President's column, Continued from page 19

Spring, 2005: It is the hope of MSA Council that MSA would be able to co-sponsor a Goldschmidt Conference in the USA in the spring of 2005.

And now to the second MSA Council issue that will be of interest to MSA membership. This involves the fast evolving and complex field of websites, electronic databases and electronic publishing. In order to remain abreast of all developments and best choice venues in this area MSA's Vice President, Rod Ewing, was asked to establish a task force on electronic publishing. Also the Council considered at length a further proposal, originally presented to Council in 1999, by Richard A. Bideaux, General Partner in Mineral Data Publishing, to make the two *Silicate volumes of Handbook of Mineralogy* available as an electronically accessible database for MSA membership on MSA's website. It was decided that if Dick Bideaux would allow such an experiment to begin fairly soon and if MSA's "web wizard" Gordon Nord saw no great hurdles in doing this, that MSA would go ahead with such a "test" of making a major mineralogical database available electronically. I have spoken with both Dick and Gordon and I believe that such a development will take place fairly soon.

Share your Lattice!

"Collector's Corners" on the MSA Website

By David Von Bargaen, E-mail: davidvb@worldnet.att.net

The "Collector's Corner" of the MSA's Internet site opened for business early in May. It is a site designed for anyone with an interest in minerals who wants to learn more about them. The site is a combination of original content, articles from the *American Mineralogist*, and links to other web sites.

The Frequently Asked Question section is derived from the Ask-A-Mineralogist bulletin board. Questions from the bulletin board have been transferred to the Collector's Corner and are organized by topic. The answers published here have a

bit more background information and links are added. I thank the members who have helped answered Ask-A-Mineralogist questions on the MSA Talk list.

In response to queries to the MSA website, a state by state listing of state mineral locality indexes, state issues of "hobby" magazines, state mineralogies, and web resources is provided.

A page on the classic mineral localities lists mineral sites with a diverse mineralogy or many type species. The information listed includes a count of the total number of species and type minerals along with litera-

ture and web references.

The first article from the "archives of the *American Mineralogist*" is Peter Rickwood's "The Largest Crystals" from 1981.

Future plans include "re-printing" more articles from the *American Mineralogist*, adding an illustrated glossary of mineralogical terms (a picture is worth a thousand words—and takes about as long to download), and adding a searchable table of contents for the first fifty years of *Rocks & Minerals* (as an adjunct to Lanny Ream's MINDEX program—a computer index to the "hobby" literature).

America's oldest popular magazine about minerals

Amateurs as well as scientists delight in and pore over *Rocks & Minerals*, which has published articles on mineralogy, geology, and paleontology since 1926. Regular departments explore such topics as fossils, microminerals, and current geologic events. Detailed lists of collecting opportunities in specific localities appear periodically. Spectacular color photographs appear throughout each issue.

Recent articles include:

- On the Road to Minas Gerais, Brazil by Anthony R. Kampf
- Mines & Minerals of Michigan & Iron Country by Ramon S. DeMark
- Mineralogy of the Jomac Mine, San Juan County, Utah by Patrick E. Haynes
- Scepter Quartz Crystals from the Treasure Mountain Diamond Mine near Little Falls, Herkimer County, New York by Robert L. Borsfky, Robert Whitmore and Steven C. Chamberlain

Special Offer

15% off a one-year subscription for all Mineralogical Society of America members
Call (800) 365-9753



Rocks & Minerals is published by Helios Publications, division of the nonprofit Helen Dwight Reid Education Foundation
<http://www.helios.org> <http://www.rocksandminerals.org>



People in the News

The Natural Sciences and Engineering Research Council of Canada have awarded a Canada Research Chair in Crystallography and Mineralogy to Dr. Frank C. Hawthorne, Distinguished Professor of Geological Sciences at the University of Manitoba. This provides teaching relief and significant additional research funding for seven years, and is renewable.

Frank Hawthorne was born in Bristol, England, and grew up in Bristol and Maidenhead, where his principal interests were playing rugby, field hockey, cricket, and track and field. He has a B.Sc. in Geology from Imperial College, London, an A.R.S.M. from the Royal School of Mines, London, and a Ph.D. in Geology from McMaster University, Hamilton, Ontario. He moved to the University of Manitoba as a Post-doctoral Fellow in 1973, became a Research Associate in 1975 and a University Research Fellow in 1980. He became an Associate Professor in 1984 and a Full Professor in 1985.

Frank is widely recognized as an authority on amphiboles and other groups of complex rock-forming minerals, the topology and energetics of mineral structures, long-range and short-range order in minerals, the role of light lithophile elements in complex minerals, crystal-structure determination of minerals, complementary analytical techniques, and he has described many new minerals, interacting widely with the mineral-collecting community in the process. He is widely regarded as a seminal thinker in the areas of Mineralogy and Crystallography; his work addresses the widest range of topics and addresses some of the most fundamental questions on the behavior of solid in general and minerals in particular. His current interests involve science, poetry, biography and art, and he has been known to drink coffee.

Deadline

Material for the August 2001 Lattice is July 16, 2001.

Contributions may be sent to Andrea Koziol via surface mail at the Department of Geology, University of Dayton, Dayton, OH 45469-2364 or via e-mail at koziol@notes.udayton.edu. □

Symposia at ACS 222nd National Meeting, Chicago, Illinois

The Geochemistry Division of the American Chemical Society is sponsoring several symposia at the ACS meeting to be held at Chicago, IL, August 26–30, 2001. They include “Contaminant Geochemistry in the Hanford Vadose Zone” (Oral symposium #1639), “Geochemical and Environmental Applications of Molecular Isotopic Analysis (Oral symposium #1674), “Spectroscopic Characterization of Metal Contaminants in Natural Systems (Oral symposium #1316), and “Surface Reactivity and Catalysis in Geological Systems” (Oral symposium #1306). For more info, <http://www.acs.org/meetings/chicago2001> or <http://membership.acs.org/G/GEOC/>.

Coming in the *American Mineralogist*

LETTERS

- 932 **Feldspar thermometry in ultrahigh-temperature metamorphic rocks: Evidence of crustal metamorphism attaining ~1100 °C in the Archean Napier Complex, East Antarctica**
Tomokazu Hokada

ARTICLES

- 773 **Calcite inclusions in forsterite**
John M. Ferry
- 780 **The induced thermoluminescence and thermal history of plagioclase feldspars**
P.H. Benoit, C.P. Hartmetz, J.D. Batchelor, S.J.K. Symes, and D.W.G. Sears
- 790 **Characterization and comparison of structural and compositional features of planetary quadrilateral pyroxenes by Raman spectroscopy**
Alian Wang, Brad L. Jolliff, Larry A. Haskin, Karla E. Kuebler, and Karen M. Viskupic
- 807 **A $P2_1/c-C2/c$ high-pressure phase transition in $\text{Ca}_{0.5}\text{Mg}_{1.5}\text{Si}_2\text{O}_6$ clinopyroxene**
Mario Tribaudino, Mauro Prencipe, Fabrizio Nestola, and Michael Hanfland
- 814 **Energy-filtered transmission electron microscopy (EFTEM) of intergrown pyroxenes**
Kevin T. Moore, David C. Elbert, and David R. Veblen
- 826 **TEM analysis of microbial mediated sedimentation and lithification in modern marine stromatolites**
John F. Stolz, Timothy N. Fein, Joshua Salsi, Pieter T. Visscher, and R. Pamela Reid
- 834 **Mineralogy of a natural As-rich hydrous ferric oxide coprecipitate formed by mixing of hydrothermal fluid and seawater: Implications regarding surface complexation and color banding in ferrihydrite deposits**
Denis G. Rancourt, Danielle Fortin, Thomas Pichler, Pierre-Jean Thibault, Gilles Lamarche, Richard V. Morris, and Patrick H.J. Mercier
- 852 **A C/MoS₂ mixed-layer phase (MoSC) occurring in metalliferous black shales from southern China, and new data on jordisite**
Li-Shun Kao, Donald R. Peacor, Raymond M. Coveney Jr., Gengmei Zhao, Keenan E. Dungey, M. David Curtis, and James E. Penner-Hahn
- 862 **Step edges on galena (100): Probing the basis for defect driven surface reactivity at the atomic scale**
Udo Becker and Kevin M. Rosso
- 871 **Solubility study of Ti,Zr-based ceramics designed to immobilize long-lived radionuclides**
Gilles Leturcq, Thierry Advocat, Kaye Hart, Gilles Berger, Jacques Lacombe, and Armand Bonnetier
- 881 **Characterization of synthetic Cs-Li-cancrinite grown in a butanediol-water system: An NMR spectroscopic and Rietveld refinement study**
Michael Fechtelkord, Britta Posnatzki, Josef-Christian Buhl, Colin A. Fyfe, Lee A. Groat, and Mati Raudsepp
- 889 **Optical spectra of Co²⁺ in three synthetic silicate minerals**
Michael N. Taran and George R. Rossman
- 896 **Spectroscopic standards for four- and fivefold-coordinated Fe²⁺ in oxygen-based minerals**
George R. Rossman and Michael N. Taran
- 904 **Hydrous species in crystalline and metamict titanites**
Ming Zhang, Lee A. Groat, Ekhard K.H. Salje, and Anton Beran
- 910 **First principles study of water adsorption on the (100) surface of zircon: Implications for zircon dissolution**
Etienne Balan, Francesco Mauri, Jean-Pierre Muller, and Georges Calas
- 915 **A molecular dynamics study of the glass transition in $\text{CaAl}_2\text{Si}_2\text{O}_8$: Thermodynamics and tracer diffusion**
Neil A. Morgan and Frank J. Spera
- 927 **The crystal structure of aravaipaite**
Anthony R. Kampf

And much more

Information Form for the *Earth Sciences Speakers Directory*

Yes! I want to advance the public's knowledge of the importance of minerals and the earth sciences. I am willing and able to speak to mineral clubs, Scout groups, museums, schools, etc., about the earth sciences. Please add me to the *Earth Sciences Speakers Directory*. PLEASE TYPE OR PRINT CLEARLY.

Full Name (Title, First, Middle, Last): _____

Affiliation: _____

Primary Address: _____ 2nd address: _____

City: _____

City: _____

State/Prov: _____ ZIP: _____

State/Prov: _____ ZIP: _____

Country: _____

Country: _____

Phone: _____

Phone: _____

FAX: _____

FAX: _____

Email: _____

Email: _____

WEB: _____

WEB: _____

Professional Background:

Degree/year: _____ Major: _____ College/Univ: _____

Current / most recent employer: _____ Title: _____ Retired?

Professional societies: MSA FM GSA SEG SME Other: _____

Topics and Titles of talks, programs, and/or demonstrations which I can give:

Topic Title of Talk (e.g. Topic="Volcanoes", Title = "Minerals from Mt. St. Helier")

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Please list up to 3 articles you have authored about which you'd be willing to talk to the public:

I'm willing and interested in speaking to the following types of groups:

- General public Rock & Mineral clubs Gem & Mineral shows Museum groups
- Grade schools High schools Professional groups Youth groups (Scouts, etc.)
- Other: _____

Do you require:

- Honorarium? Yes No No, but I'd like one! How much? \$ _____
- Travel expenses? Yes No I'm am not willing to travel more than _____ miles from my home.
- Equipment? Slide projector Overhead projector Video player Video projector

I am willing to have the information above listed in the Earth Sciences Speakers Directory.

Print Name: _____ **Signature:** _____ **Date:** _____

Send completed forms to: Dr. Andrew Sicree (Director, Penn State Univ. Museum), Attn: Speaker's Directory, PO Box 10664, State College, PA 16805. Call (814) 865-6427 or email <sicree@geosc.psu.edu> for more info. Please feel free to add additional comments and/or materials such as bio., CV, clippings, other work and speaking experience.

New Publications

There are two new publications in the *Reviews in Mineralogy and Geochemistry* (RiMG) series. MSA is now carrying the *European Mineralogical Union Notes in Mineralogy* series and offering them to members on the same terms as its other publications.

RiMG Volume 41 is titled **High-Temperature and High Pressure Crystal Chemistry** and is edited by Robert M. Hazen and Robert T. Downs. Topics include the characterization, interpretation, and description of structural variations with temperature and pressure, and experimental techniques used to investigate them. There are several unusual features about this RiMG volume. It has a lenticular print on the front cover that is a short movie showing the structural change in quartz with changing pressure and temperature, there is a color signature, and a series of flip movies on the margins of chapter 4 showing structural changes. These and other animations can be also found at http://www.geo.arizona.edu/xtal/movies/crystal_movies.html. 596 pp. ISBN 0-939950-53-7. The cost is US\$27 for members and US\$36 for nonmembers.

RiMG Volume 42 is titled **Molecular Modeling Theory: Applications in the Geosciences**, and was edited by Randall T. Cygan and James D. Kubicki to accompany the The Geochemical Society short course of the same name held Roanoke, VA May 18-20 just before the Goldschmidt Conference in Hot Springs, VA. General introduction to molecular modeling methods and a review of various applications of the theory to problems in the geosciences. Molecular mechanics methods that are reviewed include energy minimization, lattice dynamics, Monte Carlo methods, and molecular dynamics. Important concepts of quantum mechanics and electronic structure calculations, including both molecular orbital and density functional theories, are also presented. Applications cover a broad range of mineralogy and geochemistry topics—from atmospheric reactions to fluid-rock interactions to properties of mantle and core phases. Emphasis is placed on the comparison of molecular simulations with experimental data and the synergy that can be generated by using both approaches in tandem. 550 pp. ISBN 0-939950-52-9. The cost is US\$24 for members and US\$32 for nonmembers.

The European Mineralogical Union (EMU) launched its series of short courses (“Schools”) and accompanying review volumes (“Notes,” ISSN 1417 2917) in 1997. MSA offers the *EMU Notes in Mineralogy* to its members under the same terms as *Reviews in Mineralogy and Geochemistry*. The cost of each volume is US\$18 for members and US\$24 for nonmembers. There are three volumes:

EMUN Volume 1, **Modular Aspects of Minerals**. Edited by Stefano Merlino (1997) 448 pp. Modular structures of minerals and inorganic materials: OD structures polytypism and mixed layer minerals in phyllosilicates, polysomatism, sulfides and sulfosalts, different approaches to modularity.

EMUN Volume 2, **Environmental Mineralogy**. Edited

by D. J. Vaughan and R. A. Wogelius (2000) 434 pp. Nature of environmental mineralogy, analytical, experimental, and computational techniques, mineralogy of key environmental systems: soils, marine sediments, microbes, aerosols, mine wastes, landfills, nuclear waste depositories; minerals & cultural heritage and human health.

EMUN Volume 3, **Solid Solution in Silicate and Oxide Systems of Geological Importance**. Edited by Charles Geiger (available after June, 2001)

These new books can ordered either on the order form that appears elsewhere in this issue of *The Lattice*, or online through the MSA website

IN MEMORIAM

Elburt F. Osborn (LF-1940), MSA President (1961)
 J. M. Piotrowski (M-1966)
 Richard E. Stoiber (LF-1935)
 Charles J. Vitaliano (LF-1938)

Advertisements in *The Lattice*

The Lattice accepts paid advertisements.

Rates:

Ad frequency:	1 time	4 times
<u>Ad type</u>	<i>(per insertion)</i>	
Full page:	\$500	\$400
Half page:	\$250	\$200
Quarter page:	\$125	\$100
Eighth page:	\$75	\$50

Details may be obtained from the MSA Business Office: J. Alex Speer, Mineralogical Society of America, 1015 Eighteenth Street, N. W., Suite 601, Washington D. C. 20036, Telephone: 202-775-4344, Fax: 202-775-0018, E-mail: business@minsocam.org. Electronic advertisements in tiff or eps formats, or Word, can be accepted, and should be sent directly to the MSA Business Office.

Geological Materials Research Contents

VOLUME 2 2000

v2n1 Richard A. Ketcham, Raymond A. Donelick, and Margaret B. Donelick, *AFTSolve: A program for multi-kinetic modeling of apatite fission-track data* (Published 15 March 2000, 18 pages, 2 tables, 12 figures)

v2n2 J.L. Crowley, E.D. Ghent, S.D. Carr, P.S. Simony, and M.A. Hamilton, *Multiple thermotectonic events in a continuous metamorphic sequence, Mica Creek area, southeastern Canadian Cordillera* (Published 24 May 2000, 23 pages, 2 tables, 14 figures)

v2n3 David M. Hirsch, Richard A. Ketcham, and William D. Carlson, *An evaluation of spatial correlation functions in textural analysis of metamorphic rocks* (Published 2 June 2000, 21 pages, 1 table, 20 figures, 5 3DMF figures, 3 appendices)

VOLUME 1 1998-1999

v1n1 Frank S. Spear, Christopher G. Daniel, *3-dimensional imaging of garnet porphyroblast sizes and chemical zoning: Nucleation and growth history in the garnet zone* (Published 30 October 1998, 17 pages, 3 tables, 19 figures, 4 movies)

v1n2 John B. Brady, John T. Cheney, Amy Larson Rhodes, Angela Vasquez, Chris Green, Mathieu Duvall, Ari Kogut, Lewis Kaufman, Dana Kovaric, *Isotope geochemistry of Proterozoic talc occurrences in Archean marbles of the Ruby Mountains, southwest Montana, U.S.A.* (Published 31 December 1998, 16 pages, 3 tables, 19 figures)

v1n3 Frank S. Spear, *Real-time AFM diagrams on your Macintosh* (Published 25 May 1999, 10 pages, 8 figures, 1 interactive figure, 3 movies)

v1n4 J. Alcock, Kevin Myer, P.D. Muller, *Three-dimensional model of heat flow in the aureole of the Marcy anorthosite, Adirondack Highlands, New York: Implications for depth of emplacement* (Published 22 September 1999, 11 pages, 1 table, 7 figures)

v1n5 Barry R. Bickmore, Eric Rufe, Steve Barrett, and Michael F. Hochella, Jr., *Measuring Discrete Feature Dimensions in AFM Images with Image SXM* (Published 23 November 1999, 10 pages, 9 figures, 1 movie)

v1n6 Joseph M. Pyle and Frank S. Spear, *Yttrium zoning in garnet: Coupling of major and accessory phases during metamorphic reactions* (Published 14 December 1999, 23 pages, 2 tables, 21 figures)

MINERALOGICAL SOCIETY SERIES (9)

Environmental Mineralogy: Microbial Interactions, Anthropogenic Influences, Contaminated Land and Waste Management

Edited by J.D. Cotter-Howells, L.S. Campbell, E. Valsami-Jones and M. Batchelder

Mineralogists have always sought to understand the chemical and physical environment under which a particular mineral forms and to determine the arrangement of atoms within that mineral. The field of Environmental Mineralogy asks the same questions in a different context and seeks to define the roles of minerals in all natural ecosystems, together with understanding the preservation and restoration of such systems.

The gap in our understanding of how minerals behave in the surface environment is now being filled, and the need for innovative, 'green' solutions to the problems of contamination and waste is being addressed. Mineral-environment interactions are being used increasingly, and vast opportunities exist not only for pollution remediation, but also for long-term sustainable management of resources and waste.

This monograph, published by the Mineralogical Society of Great Britain and Ireland, provides an up-to-date account of the state of this diverse subject area. With chapters containing a strong review element, this volume will appeal to both senior undergraduate students and researchers alike.

Orders: Turpin Distribution Services Ltd, Blackhorse Road, Letchworth, Herts SG6 1HN, UK
Tel. +44 (0)1462 672 555
Fax: +44 (0)1462 480 947
E-mail: books@turpinltd.com

Hard Back: ISBN 0 903056 20 8. Published, December 2000, xii + 414 pp., 62 line-art, 21 half-tone images.

List price: **£50 (US \$70)**

Members of the Mineralogical Society of Great Britain & Ireland: **£32 (US \$45)**

Members of the Mineralogical Society of America **£39 (\$55)**

A list of contents and a printable **order form** are available on the Mineralogical Society website (www.minersoc.org).

Need Portability?



Whether you need news or scientific results, instant information is what everyone wants. From drilling platforms to laboratory desktops, Rigaku's Miniflex™ lets you identify compounds immediately and locally. Difficult problems? Data can be e-mailed to your offsite analytical laboratory. No analytical laboratory? Let Rigaku's contract services help.

The Miniflex™ is made for rugged environments. Miniflex's™ are found at mine sites, in pick-up trucks for mobility, glove-boxes for isolation and undergraduate laboratories. The low cooling requirements and 110V operation makes it ideal for portable power units. With an outstanding cost-to-performance ratio the Miniflex provides data when you need it.

Visit us on the web at: www.rigaku.com



Rigaku

9009 New Trails Drive
The Woodlands, Texas 77381
Tel: 281-363-1033
Fax: 281-364-3628
E-mail: info@rigaku.com

Portable X-ray Diffraction That's Out Of This World!



1015 Eighteenth Street NW Ste 601
Washington, DC 20036-5212

RETURN SERVICE REQUESTED

NON-PROFIT ORG.
U.S. POSTAGE PAID
PERMIT NO. 4450
DAMASCUS, MD