



www.clays.org

## The Clay Minerals Society



### FROM THE PRESIDENT

The 13<sup>th</sup> International Clay Conference held at Waseda University in Tokyo (August 21–27, 2005), from which I recently returned, provided an exciting window into the future of clay science. With “Claysphere” as its main theme, the conference examined the interface and interrelationships of clay minerals in a wide array of subject areas, ranging from soil science to advanced materials science. Approximately 400 people attended the meeting, with over 300 papers presented. Of particular interest was the participation of more than 200 people from Japan. We enjoyed the hospitality of our Japanese colleagues in a wonderful venue in an exceptionally modern city. One of the distinctive aspects of the meeting was its emphasis on clays and clay minerals as materials that combine with organic molecules (e.g. polymers, surfactants, optically active molecules, chiral molecules) for applications related to nanocomposites, biosensors, drug delivery systems, optics, green chemistry, and catalysis.

It is difficult to capture the essence of the 13<sup>th</sup> ICC in a few short paragraphs. Nonetheless, here are a few highlights of the meeting. A. Yamagishi presented the opening keynote presentation on the chiral character of clay minerals. E. Ruiz-Hitzky described recent progress in making functional nanostructured polymer and biopolymer–clay materials. P. Davidson presented a beautiful lecture on the orientational order in clay gels. K. Kogure showed incredible electron back-scattered diffraction and high resolution TEM images of kaolinite, mica, and pyrophyllite, which are providing new fundamental insights about familiar materials. Finally, H. Sato presented an engaging lecture entitled “Can Simulation Surpass Experimental Clay Science?” These presentations represented, in my opinion, some of the best and most exciting research themes emerging under the growing umbrella of clay science.

Cliff Johnston  
President, The Clay Minerals Society

### CHANGING HANDS

We thank Kathy Nagy for her time devoted as Society News Editor and for starting the CMS–*Elements* connection. An editorial committee has been formed, with Lynda Williams (Arizona State University, USA), Stephen Hillier (The Macaulay

Institute, UK) and Kevin Murphy (Managing Editor, *Clays and Clay Minerals*, Ireland) responsible for coordinating news items. Please send your announcements or suggestions to: [lynda.williams@ASU.edu](mailto:lynda.williams@ASU.edu), [s.hillier@macaulay.ac.uk](mailto:s.hillier@macaulay.ac.uk), or [kmurphy@iol.ie](mailto:kmurphy@iol.ie)

### MARK YOUR CALENDARS

for the June 3–7 CMS 43<sup>rd</sup> Annual Meeting in Oléron, France, held jointly with the Groupe Français des Argiles.

### CHECK OUT CLAYS AND CLAY MINERALS

Clays are fascinating materials to study, both from a fundamental point of view and because they have applications in many fields, e.g. Earth science, materials and nanomaterials science, radwaste disposal, and landfill technology, and they are important for countless environmental purposes.

*Clays and Clay Minerals* publishes the latest research on all aspects of clays, and a scan through just the first four issues in 2005 shows the phenomenally wide range of current clay research.

Mineralogists with a geological background will be interested in the papers on (1) smectite dehydration during land subsidence in

a shallow sedimentary basin (Liu and Lin, p. 55), (2) fine-grained minerals associated with a gold deposit in China (Hong and Tie, p. 162), (3) bentonites from Morocco (Ddani et al., p. 250), and (4) expandable clay minerals in Lake Baikal sediments (Grygar et al., p. 389). Many papers will catch the eye of those with a more crystallographic and spectroscopic bent: (1) use of atomic force microscopy (and transmission electron microscopy) to study the transformation of palygorskite to smectite (Krekeler et al., p. 92) and montmorillonite dissolution in highly alkaline conditions such as occur during disposal of radioactive wastes

### 2005 PROFESSIONAL AWARDS



The following awards were presented at the 2005 annual meeting last June.

1. Jeff Wilson, recipient of the 2005 CMS Distinguished Member Award
2. Jill Banfield, recipient of the 2005 CMS Pioneer in Clay Science Award
3. Sam Traina, recipient of the 2005 CMS Jackson Mid-Career Award
4. Maria Franca Brigatti, recipient of the 2005 CMS Brindley Award



### 2005 CMS ANNUAL MEETING STUDENT AWARD WINNERS

5. BEST PAPER: William Smith, Purdue University – “Crop rotation and sequence influence on soil manganese availability,” co-authored by D. Schulze and D.M. Huber.
6. BEST PAPER RUNNER-UP: Sang Soo Lee, University of Illinois at Chicago – “Relationship of unit-cell parameters with chemical composition of aluminum-saturated chlorite,” co-authored by S. Guggenheim, M.D. Dyar, and C.V. Guidotti.
7. BEST POSTER: Burch Fisher, Dartmouth College – “The ferruginous beidellite-to-halloysite transition in a tropical soil chronosequence,” co-authored by P.C. Ryan.

## THE REYNOLDS CUP—A TOOL FOR RAISING THE STANDARD OF QUANTITATIVE MINERAL ANALYSIS

(Yokoyama et al., p. 147), (2) a crystal chemical study of  $2M_1$  dioctahedral mica (Brigatti et al., p. 190) and (3) electron back-scattered diffraction to determine the polytypes of kaolin minerals (Kogure et al., p. 201).

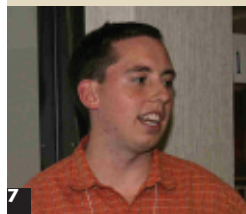
Chemists studying the adsorption of organic compounds by clays will find the sorption of surfactants by some clays (Sonon and Thompson, p. 45) of interest, as well as sorption of a herbicide onto montmorillonite (Ikhsan et al., p. 137) and a study of how the toxic effects of ricin used by terrorists can be minimized by adsorption by montmorillonite (Jaynes et al., p. 268). Add to all

these, other studies such as the microbial formation of a halloysite-like mineral (Tazaki, p. 224), synthesis of a flame-retardant and smoke suppressant borate-intercalated layered double hydroxide (Shi et al., p. 294) and the heat capacity of berthierine (Bertoldi et al., p. 380) and it is clear that papers in *Clays and Clay Minerals* are as diverse as clays themselves. You can find out more about papers published in the journal, and about the organization that publishes it, by going to The Clay Minerals Society website: [www.clays.org](http://www.clays.org)

Derek C. Bain,  
Editor-in-Chief



8. BEST POSTER RUNNER-UP: Utku Solpuker, University of Cincinnati – “The use of tuffs as Pozzolanic materials in the cement industry: The effect of calcinations.”



9. RESEARCH AWARD WINNERS: Edwin B. Ntasin (photo), University of Buea and Krzysztof Starzek, Jagiellonian University



10. R.C. REYNOLDS RESEARCH AWARD: Amelia C. Robinson, University of California-Davis



11. 2005 STUDENT TRAVEL GRANT AWARD WINNERS (L-R): Zeynep Saglam, Julia Berger, Anja Dosen, Heather Easterly, Anja Schleicher, Utku Solpuker, Funda Toprak, Amanda Turner, GengXin Zhang, Deb Jaisi (D. Moore at podium)



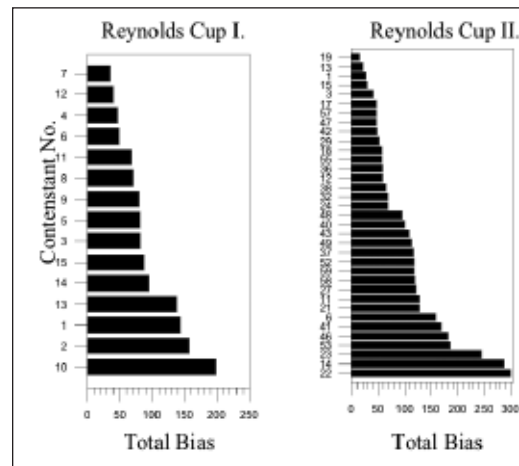
Quantitative phase analysis of complex rock samples containing clay minerals is a frequent task for mineralogical laboratories.

Although techniques like X-ray powder diffraction, chemical analysis, and thermal analysis are well established, mineral quantification is often discussed with widely varying claims and views on accuracy and precision. An objective tool for evaluating the actual performance of methods of phase analysis is an open inter-laboratory round robin event. The “Reynolds Cup” project was initiated by a group of CMS members (Dougal McCarty, Jan Srodon, and Dennis Eberl) and named after Bob Reynolds to honour his pioneering work in clay mineral analysis. The idea was to offer to interested laboratories a set of “artificial rocks” prepared from pure minerals and representing real mineralogical compositions for qualitative and quantitative analysis. The participants apply the technique of their choice and report the qualitative and quantitative phase compositions. The competitive aspect was chosen to motivate the community by awakening their sporting spirit. However, the goal was not to crown the best laboratory, but (1) to obtain an objective picture of the quality of mineral analysis, (2) to help improve analytical methods by providing test samples, and (3) to enhance the quality of phase analysis for realistic mineral assemblages.

The first contest was organized by Dougal McCarty in 2002. Three mineral mixtures, each containing up to 13 minerals, were sent to 40 laboratories on a first-come-first-served basis. Only 15 results were returned. In 2004, the second Reynolds Cup was organized by Reinhard Kleeberg in the same manner, but with nine or ten mineral components per sample. From 60 sample sets distributed, 35 sets of results were received. Some details of the outcomes are available at <http://www.iucr.org/iucr->

[top/comm/cpd/cpd27.pdf](http://www.dttg.ethz.ch/rc2004.pdf) and <http://www.dttg.ethz.ch/rc2004.pdf>

Of particular interest are the methods used by the participants. X-ray powder diffraction is clearly the dominant method. Other techniques are mostly used as supporting methods. In 2002, a third of the contestants used full profile-fitting methods with the single-line methods dominating. In 2004, more than two thirds applied full-pattern fitting techniques, mostly the Rietveld method. Combinations of different techniques are frequently used. Very impressive results were obtained by the top contestants. Their sum of bias was <29 wt%, even though 29 counted minerals had to be analyzed, indicating a mean deviation of better than 1% absolute (see figure). On the other hand, less experienced participants reported concentrations far from reality. From this point of view, the contest provides a fun teaching tool. The winner of the second



Reynolds Cup competition, Oladipo Omotoso, will organize the third cup. The event is starting in January 2006. The CMS council has decided to endorse and support the Reynolds Cup in the future. For the latest information see [www.clays.org/reynoldscup.html](http://www.clays.org/reynoldscup.html). It's fun—why not try it?

Douglas K. McCarty and  
Reinhard Kleeberg