

Fig. 2. Conversion rate depends on amine's acidity and length.

evolution of life. **Mark Ciardelli**, our new MS-candidate student, is interested in the arsenic contamination problem in the Fox River Valley, WI. He will pick up where our previous MS student, **Katie Thornberg**, left off. Katie's paper on the arsenic project was published in *Environmental Science and Technology*. Undergraduates, **Emily Kleiber** and **Amrik Ray** worked on arsenic contamination in Bangladesh and on organic-mediated clay synthesis. Our group will grow this spring with the addition of post-doctoral research associate, **Young Lee**, from SUNY-Stony Brook, who will work on metal and organic coprecipitation mechanisms with applications in biomineralization and contaminant remediation.

My own research efforts have continued on theoretical and crystallographic considerations to explain why certain silica-based ceramics are "bioactive"—promote apatite growth at their surfaces when implanted as prosthetic devices in the body thus forming a bond between the implant and existing bone—whereas other materials are inert. In collaboration with Belgian colleague, **Prof. Michel Anseau**, we have exciting results which suggest that pseudowollastonite (psW) is bioactive because it has a specific structural arrangement of silicate functional groups on the (001) face that provide an epitaxial match for the (001) face of apatite (Fig. 3). Our manuscript is currently in review at *Biomaterials*. It was great fun teaching "Fluids and Sedimentary Processes"

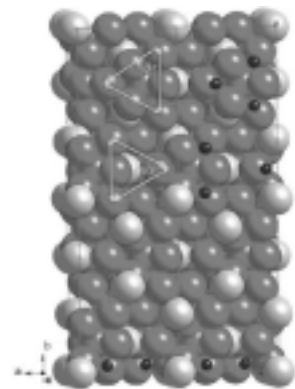


Fig. 3. Plan view of (001) on psW showing silicate groups at 600. Ca=light grey; O=dark

with **Prof. Alan Carroll**. Our group seminar benefited from the participation of **Silke Severmann**, **Heidi Crosby** and **Prof. Huifang Xu**.

I've been fortunate this year in proposal funding—honored to get the NSF CAREER award and an ACS-PRF grant supporting our work on cell self-assembly. I've also been gratified by several



Jose Fransisco Mediato Arribas (IGME) and Oibane Astui Zubika (Campus Nord Barcelona), left, Toni Simo, center, and Leo Piccoli look over data after a day in the field in the Pyrenees.

invitations to conferences and other universities, to teach at a workshop on using computational methods in geochemistry, and have organized symposia on Biogeochemistry and Biomineralization at the ACS and Goldschmidt Conferences. In the "Top 10" list of best news for me this year, is that UW has approved early tenure for me with promotion to Associate Professor. I am deeply appreciative of our entire faculty's efforts to make this happen, especially of our Chair, **Prof. Clark Johnson**. It has been a lot of fun celebrating with my students, colleagues, and friends.

TONI SIMO

2004 was a busy and rewarding year; it was fun seeing so many of you during my travels and to catch up with your activities. Traveling took a large part of my time; I visited Tunisia three times, Venezuela, Indonesia, Italy, Czech Republic, Norway, Canada, many trips to Spain, and numerous trips to cities, field areas and meetings in the US. My family is doing well and I am having a great time teaching undergraduate core courses and specialized graduate courses.

I continue my collaboration with researchers at the UPC-Barcelona where I advise one PhD student and a postdoc. The project involves studying a Pleistocene delta near Barcelona from an environmental point of view. The delta's aquifers are starting to be contaminated and excess pumping is creating a salt intrusion. The work is fascinating as it integrates thousands of wells, seismic, geochemical well data, and age dates. Some of the material is so good that I am using it for instruction in class. In a similar line of research (environmental sedimentology) **Wasinee Aswasereelert** is completing a MS degree on the Eau Claire shale in Wisconsin. This is a project with **Dave LePain** from the Wisconsin Geological Survey and the shale protects much of the Cambrian aquifer.

The Java project (in collaboration with **Prof Alan Carroll**) is “maturing” nicely as both **Essam Sharaf** and **Martin Shields** have completed their PhD theses. Manuscripts have been submitted and accepted; check the AAPG Bulletin and Stratigraphy journals. **Mei-mei Tang** has joined the group and will work the details of the Miocene mixed system with important tectonic implications. Our work has established the stratigraphic architecture of the basin, which appears to challenge the tectonic concepts of the island of Java.

In collaboration with **Prof Brad Singer**, **Lauren Chetel** has completed her MS degree on the geochronology and provenance of Ordovician K-bentonites. She has established the ages for three K-bentonites at the base, middle and top of the local Galena Formation providing temporal constraints in sedimentation rates and processes on epeiric seas. A surprising result is that some of the previously identified K-bentonites have K-feldspars that are much older (3.1 Ga to 850 Ma) than the encasing Ordovician rocks suggesting a detrital origin rather than Ordovician-age ash deposits.

Mechanical stratigraphy continues to be important in my research. Fieldwork in the Pyrenees with **Prof. Michele Cooke** and student and in Tunisia with **Chris Gordon** has emphasized the importance of fractures in carbonates and especially fluid flow through the fractures during and after fracture formation. The fracture mapping and fold reconstruction is in collaboration with **Prof. Basil Tikoff** who will be doing gravimetry study over an anticline that is suspected of being cored by salt. Ongoing research includes work in the Guadalupe Mountains in collaboration with **Jana**

van Alstine, University of Barcelona researcher specialist in diagenesis and fluid flow, and researchers from ENI and Norsk Hydro.

Ground Penetrating Radar (GPR) in carbonates has been one of the main areas of research as many companies have shown great interest in our method and results. Following field campaigns in the Hueco and Guadalupe Mountains, **Neal Lord**, **Leonardo Piccoli**, **Preeya Jirutthitijaroen** and I did a field work in the Pyrenees. The novelty is the integration between GPR lines, geologic outcrop mapping and laser scanning of the outcrop that allow quantification and interpretation of depositional geometries in 3D. Much of this work is directly applied to reservoir architecture and seismic interpretation.

BRAD SINGER

January found students **Danny Douglass**, **Richard Becker**, and **Brad Sleeth** along with **Dave Mickelson**, **Jim Bockheim** (professor in Soils Science), visiting professor **Jorge Rabassa** and I in southern Argentina and Chile for several weeks as we continue to document the history of the Patagonian ice cap during the Late Pleistocene and Holocene via mapping glacial deposits and dating them using cosmogenic nuclides. Results on the timing of ice advances during the last glaciation maximum published in the GSA Bulletin in May by former Weeks Post-Doc **Mike Kaplan**, **Danny Douglass**, and I caught the attention of *Science* magazine as an editor’s choice (see “Moving in synchrony,” *Science*, v. 304, p. 491).

I spent 10 days in May aboard the U.S. Fish and Wildlife Service ship *R/V Tiglax* which provided student **Brian Jicha** and I access for the first time, via the Bering Sea, to the rugged northern coastline of Seguam Island, an active volcano in the central Aleutian Island arc. We have now mapped and dated using $^{40}\text{Ar}/^{39}\text{Ar}$ methods virtually the entire volcanic history of this island. A GSA Bulletin article on this unique volcanic record is on the horizon.

Working with **Brian Beard**, **Clark Johnson**, and I, Brian Jicha also obtained the first UW-Madison U-Th isotope disequilibria results, from magmas erupted at Seguam. These data surprisingly show that magma may be stored shallowly in the arc crust for >100,000 years prior to



John Hora (center, facing camera) explains his $^{40}\text{Ar}/^{39}\text{Ar}$ dating results from 6348 meter high Parinacota volcano in northernmost Chile to a group of 35 volcanologists from around the world. This stop occurred on a week-long field trip associated with the general assembly of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) in Chile last November. Hora's PhD dissertation focuses on the eruptive and magmatic evolution of this large stratovolcano and is being done under the supervision of Brad Singer.