Spring 2005

Chemistry & Biochemistry Newsletter

Department of Chemistry & Biochemistry, South Dakota State University

South Dakota State University

Chemistry & Biochemistry

Inside

Message from the Department Head

The academic year has flown by!

The department graduated eight chemistry and nine CLS undergraduate majors at Spring 2005 Commencement on April 30. Four of the chemistry majors have gone on to graduate school, one will be teaching high school chemistry and three have been offered jobs in the private sector. All of the CLS majors have positions in the clinical or biotechnology fields. During this year four Ph.D. candidates were awarded their degrees as well. As a group and as individuals, they accomplished much and should be proud of their achievement. We wish them the best as they take the next step on their journey.

The Board of Regents approved, and the 2005 Legislature authorized, an expanded Shepard Hall renovation project. As authorized by the Legislature, the renovation of New Shepard Hall/replacement of Old Shepard Hall project is now a $30 million project with up to $24 million financed through the issue of revenue bonds. This is substantial increase from the original authorization (~$18 million) and will allow us to create world-class research and instructional facilities. We will start the process of revising the facilities plan during the 2005/2006 academic year. However, it does require that we raise the funds for any work beyond the $24 million that we could generate from the bond issue. This will be a significant challenge for us. It is also a significant opportunity for you to give back to the department. If a contribution to this project is an idea that resonates with you, I would be delighted to discuss the possibilities with you further. Particularly as we enter this phase of the department's development, we need the support of our alumni if our programs are going to continue to grow and be strong.

There are many other things that I'd like to share that could convey the learning and discovery that have taken place this year, and that have put the department into a position to continue our pursuit of excellence next year: our new ~$1 million core campus mass spectrometry facility came on line in February (www.sdstate.edu/ccmsf); a company spun-off to commercialize the research of Dr. Ron Utecht, PhotoBioMed, won the Governor's 2005 Giant Vision Business Awards Competition which was sponsored by the South Dakota Chamber of Commerce and Industry; Dr. Jihong Cole-Dai was selected as one of this spring's Sewrey Colloquium speakers; and we have a strong incoming new graduate student cohort this fall. You will hear more about these stories in the Fall 2005 newsletter.

Finally, I'd like to note the retirement of long time (and I do mean "long-time"!) departmental facility manager Floyd Melrose who retired last fall (page 6). While we could never replace Floyd, Greg Marcom is doing a great job of taking over for him. We wish Floyd the best and welcome Greg to the department.

If you are in the Brookings area this summer, we would welcome a visit. We would be delighted to have the chance to bring you up to date on everything that is going on. If you would like to send us an e-mail update on what you have been doing recently, we would be happy to put it in the next newsletter.

Please stay in touch.

Jim Rice
james.rice@sdstate.edu

chemistry & biochemistry

Forensics Project Gives Students Real Life Experience in Analytical Chemistry

Instead of hiring lawyers for a vehicular homicide, arson, or a burglary case, another option might be for SDSU's Instrumental Analysis class (CHEM 434) to handle the investigation.

Not able to pronounce guilt or innocence in real life terms, the class comes mighty close to recreating real life courtroom proceedings.

Taught by Dr. Doug Raynie, assistant professor of chemistry and biochemistry, the elective course is offered each spring semester. In its laboratory, a problem-based learning approach is used where students are presented with chemistry-related problems and are expected to use their chemistry knowledge and available resources to solve them.

CHEM 434 offers the basic principles of analytical problem solving using chemical instrumentation. Students are expected to develop problem-solving skills to prepare them for a career in a technical discipline. Specifically, students are expected to understand the chemical and physical principles of instrumental measurements and the operating principles of modern instrumentation.

During the last month of the semester, students work on a crime-scene forensics project as a way to "tie everything together." They are presented a case study and assigned to work in the laboratory for either the prosecution or the defense.

"Crime scenarios are developed so each student has one piece of evidence to examine and to use his or her conclusions to support the prosecution or the defense," says Raynie. "I try to develop the evidence so that there will be strong suspicion of guilt, yet some reasonable doubt during the trial."

The project culminates in a mock trial. The only witnesses during the trial are the chemists and each chemist is expected to testify.

"The major goal is to allow the chemists to clearly and concisely present their analytical procedures and results to a non-technical audience and defend their conclusions," Raynie points out.

Learn to work together

Entering its fourth year, the forensics project has proven to be highly popular and effective. To Raynie's knowledge, the project had never been tried before at SDSU.

It's unique also because the chemists collaborate in the exercise with criminal justice class students, who pose as the jurors as well as the defense and prosecution lawyers.

The criminal justice students consult with the chemists before the trial to better understand the evidence. However, unlike the television drama *CSI*, where the stars do all the work from interviewing witnesses, gathering evidence, and taking it to the laboratory for analysis, the real world of forensics is much more specialized.

Dr. Raynie and student Amber Buckley remove samples from a piece of crime scene "evidence" for pesticide analysis.

"We assume the evidence has been collected properly and we deal with the evidence as it comes into the lab," indicates Raynie. "This is the first time a chemistry class has collaborated with a suitable class outside of the chemistry discipline as opposed to the chemists trying to do everything. This forces the chemists to take it [project] more seriously."

Raynie uses whatever forensic scenarios are available, whether it's doing drug, paint, or arson analysis.

"I'll list potential pieces of evidence and put them together in the context of a potential crime," he says. "We are limited in drug analysis, though. If we wanted to spike samples of drugs of abuse, we would need a license from the Drug Enforcement Agency which I don't have."

For example, in one case the defendant was seen running through a cornfield, which the farmer claimed he had just sprayed with pesticide. Consequently, one piece of evidence the chemists collected was pesticide samples from the stained shirt.

Matter of interpretation

In another, Raynie set up an arson scene where an abandoned farmhouse, suspected of being used as a meth lab, burned down outside of Brookings.

Besides burnt wood, there was anhydrous ammonia and Coleman camping fuel — key ingredients in the manufacture of meth. The farmer and the defendant were both charged with the same evidence, although the defendant also possessed cold pills.

In cases like that, student chemists are tested as to how best to interpret the evidence, according to Raynie.

"You can prove it's Coleman fuel, but you can't prove that what started the fire is this particular bottle of Coleman fuel," he says. "Students have a hard time sometimes arguing the preponderance of evidence; that yes, we can't prove that it was that bottle, but is it more than coincidence that he had ammonia, cold pills, and Coleman fuel? That's the dilemma for students."

Amber Buckley's interpretive skill was put to the test when she found herself literally splitting hairs in a 2003 case.

In this "crime scene," woman was found lying on a road, the apparent victim of a hit-and-run driver. A suspect driving the vehicle that matched a reported description was pulled over for a broken headlight and the driver was arrested for driving while under the influence of alcohol. Hair was discovered in the headlight casing which the suspect said came from hitting a deer.

Buckley had to prove whether the hair was from the victim or the deer. Delving into the evidence, she felt there needed to be "more to it," so she contacted the FBI crime lab. Officials there confirmed that her approach was correct and gave her particular things to look for.

Thinking things through

She took a cast of the hairs, one from the headlight and one from the victim, and put them on a slide under a microscope. What she found was a strange twist in the case.

"I discovered that it was not from the victim and actually it wasn't even deer hair either, it was some kind of canine hair," she says. "All they asked me at the trial was if the hair came from the victim and I said no. I had proof, showed them the differences in the hairs and that I had talked to the FBI."

Observes Raynie, "It turned out that our stockroom couldn't find deer hair and substituted wolf hair. During her testimony, Amber gained instant credibility when she indicated that she had consulted with her colleagues at the FBI."

Buckley, who is seeking a degree in microbiology after earning a chemistry degree in 2003, was impressed with the forensic project.

"What I really liked was that it was a problem-solving class," she says. "It was different than any class I have ever taken. It makes you think things through. You have to figure out what your next step is."

Raynie, who worked in analytical chemistry research at Proctor & Gamble for twelve years before being joining SDSU, calls the forensics project a "great teaching tool" to prepare students for the workforce.

"This helps them think critically and it teaches them about working independently in a group environment," he says. "Whether it's supporting the prosecution or the defense, their overall goal is to make sure all the evidence supports the case. It's similar in the business world, where people from accounting, marketing, and product development are on the same team, yet they have their own individual tasks."

2005 Chemistry and Biochemistry Graduates

Bachelor of Science – Chemistry

Jon Hansen (B.S., Chem in May '05), Major in Chemistry (ACS Certified)

Benjamin Heitz (B.S., Chem in May 05), Major in Chemistry

Kristin King (B.S., Chem in May '05), Major in Chemistry

Kelly Kyro (B.S., Chem in May '05), Major in Chemistry (ACS Certified)

Lane Lundeby (B.S., Chem in May '05), Major in Chemistry

Bethany Melroe (B.S., Chem in May '05), Major in Chemistry

Kevin Poenisch (B.S., Chem in May '05), Major in Chemistry

Brandon Wilcox (B.S., Chem in May '05), Major in Chemistry

Bachelor of Science – CLS

Simon Althoff (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Corinna Beavers (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Leslie Harer (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Katie Louwagie (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Alexia Madsen (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry, Biology and Microbiology

Rhonda Oedekoven (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Kim Schlimgen (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Dawn Vreugdenhil (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Tyron White (B.S. Chem in May '05), Major in Clinical and Laboratory Sciences, minor in Chemistry and Biology

Doctor of Philosophy

Yizhe An,
Spectroscopic Investigation of Electronic Relaxation Processes in Isolated Pairs of Trivalent Lanthanide Ions in $CsCdBr_3$, $CsMgCl_3$, and $CsMgI_3$ (Dr. James Rice)

Gabriela Chilom,
Natural Organic Matter: From Contaminant Interactions to Structural Aspects (Dr. James Rice)

Judit Bartalis,
Hepatoprotective Activity of Cucurbitacin (Dr. Fathi Halaweish)

Eric Huntimer,
Effect of Echinacea Angustifolia Root Extracts and Caffeic Acid Derivatives on Cancer Cell Proliferation (Dr. Fathi Halaweish)

Treasure Hunting at the South Pole

Indiana Jones went to exotic places to retrieve treasures and artifacts from ancient ruins, tribes, and spiritual figures.

For this real life movie, however, three SDSU chemists went on a treasure hunt to the bottom of the world. Assistant Professor of Chemistry and Biochemistry Jihong Cole-Dai and graduate students Drew Budner and Dave Ferris spent two and one-half weeks in December and January gathering ice core samples at the South Pole in Antarctica. Funded and supported by the National Science Foundation, the Antarctic trip was part of a joint research project with the University of California-San Diego to find clues to oxygen chemistry in Earth's atmosphere, clues buried in layers of ancient snow in the Antarctic ice sheet.

Volcanoes and oxygen

Gases from volcanic eruptions rise into the atmosphere and circle the globe. The gas molecules, through reactions with oxygen, turn into tiny sulfuric acid droplets. In Antarctica, the volcanic sulfuric acid falls and gets buried by the snow that accumulates yearly.

Chemicals such as volcanic sulfuric acid are buried in polar snow. They can be retrieved with ice cores, which "can give you a very detailed history about the atmosphere and how the chemical reactions take place in the atmosphere," says Cole-Dai, who points out that careful analysis of the sulfuric acid can reveal evidence of how oxygen chemistry functions in the atmosphere.

"We wanted to look at a number of large volcanic eruptions that took place in the last 2,000 years. Sulfuric acid from these volcanoes can tell us how oxygen chemistry works in the atmosphere. We hope to find a better way of predicting what might happen to the atmosphere in the future and maybe understand how oxygen got into the atmosphere in the first place. The secrets of how nature works are buried deep in the polar ice sheets. Our research is about finding these secrets and also scientific curiosity of how things work."

Accompanied by ice drilling engineers from the University of Wisconsin, the team drilled four holes to a depth of forty meters [130 feet] that produced ice 200 years old at the bottom; one hole to 100 meters or about 1,000 years; and another hole to 180 meters [590 feet] for ice close to 2,000 years old.

"The simplest way is to figure out first how much snow falls in a place in a year and then calculate how deep it has to be," says Cole-Dai in explaining how the age of ice is determined. "The South Pole gets about three inches of snow in a year if you figure in compaction, so if you go down 500 feet, the ice would be about 2000 years old."

Part of the hard work was handling and packing the 8,000 pounds of ice cores in insulated boxes in preparation for transport to SDSU. The eighty boxes, each weighing about 100 pounds and always kept well under freezing, were first shipped to a port in California, then trucked to the National Ice Core Laboratory in Denver, before making their way to the Ice Core and Environmental Chemistry Laboratory at SDSU for chemical analysis.

The team drilled for ice cores at this camp near the South Pole.

The preparation

Preparation for the journey began long before they set foot in Antarctica. Last summer the team made special snow working tools and equipment to use at the South Pole. They also had to go through physical and dental checkups to reduce chances of medical emergencies while on the remote continent.

In December they left South Dakota for the National Science Foundation facility in New Zealand. They were outfitted with extreme cold weather apparel that included parkas, windbreakers, fleece jackets and pants, thermal underwear, hats, wool socks, gloves and mittens, double insulated boots, goggles, and ski masks.

They ended up carrying more than thirty pounds of clothing when they boarded a military cargo plane for an eight-hour flight south to McMurdo Station, a scientific research base on the Pacific northern edge of Antarctica that served as the starting point for their Antarctic trek.

At McMurdo Station they received extensive training on how to live and work in the polar environment. They went through

Team member Drew Budner retrieves sample of ancient ice.

Bright but cold conditions made the team's work challenging.

a two-day survival course, which covered camping on ice, learning to build an igloo for emergency shelter, rescuing from falls into crevices, and instructions on radio communication.

Well fitted and trained, the team then flew on a skied cargo plane 900 miles to the Amundsen-Scott South Pole Station, the southern most spot of the earth. The day after their arrival, they set up a temporary camp for three weeks of ice coring, a location a few miles from the South Pole station, which housed about 200 scientific researches and support personnel.

Better than expected

This was Cole-Dai's third trip to Antarctica. For polar rookies Budner and Ferris, the experience wasn't quite what they expected based on what they had heard about the frozen continent.

"We enjoyed it a lot," says Ferris. "Don't read all those history books and scary stories before you go. The conditions weren't nearly as severe as we thought."

December and January are Antarctica's summer months. Temperatures at the South Pole usually climb to 20 or 30 degrees below zero Fahrenheit, not including wind chills that are another thirty and forty degrees colder. Besides the extreme cold, the South Pole air is much thinner than normal due to its 10,000 feet elevation.

Team members Jihong Cole-Dai (left), Dave Ferris (center), and Drew Budner (second from right) relaxing with other researchers during their odyssey.

During their stay, though, the temperature was a balmy ten below zero. "It was relatively mild," notes Cole-Dai. "It could be worse. The last time I was there, the air temperature was twenty-five below zero and you can really feel the difference."

Says Ferris, "We worked out of the wind behind tarps we set up, and with the bright sun and reflection, it didn't feel that bad."

While they worked wearing five layers of clothing, they slept in tents pitched at the camp. Inside their tents, it was shorts and T-shirt weather.

"It was surprising how warm it got in the tent just from the sun," says Budner. "It was sunny and warm to the touch at the top of the tent, but on the shaded side, there was frost in the tent. It was interesting because when we hung our clothes inside at the top on a sunny day it was like pulling them out of a drier."

Sleeping was perhaps their biggest challenge with the sun always shining. "Sleeping was tough . . . so bright all the time," notes Ferris. "It was so bright the first few nights I had to wear sunglasses in the tent to be able to read."

Adds Budner, "I didn't have as much trouble sleeping as I thought, but I had to wear a mask the entire time sleeping."

International camaraderie

Antarctica is considered a worldly continent. The Antarctic Treaty System, a document countries have signed to conduct only research, protects the continent by not allowing such things as military activities or drilling for oil.

Cole-Dai has called Antarctica the world's "best natural laboratory." And, because of its unique setting, scientists from other nations also venture there for research projects.

At McMurdo Station, while waiting for their flight, Cole-Dai saw science teams from Italy, Denmark, France, Germany, Norway, New Zealand, and Russia.

"You don't just see Americans, but people from around the world doing their research," he says. "That's where you truly feel that the world is one. A person gets the sense that this is a place that doesn't belong to any one country or person. It's the science that attracts people to there."

Cole-Dai hopes field trips to Antarctica can occur every couple of years, but he says that depends on the science. "To do research you have to get a project funded and that's not always a guarantee."

In the meantime, "it's work in progress," according to Cole-Dai, who indicates there's much more to the project than drilling holes on the ice sheet.

"We have many things to do in this project and drilling ice cores is the very first step," he says. "The real fun part will be analyzing the cores, getting the numbers, and figuring out what the numbers mean, because that's when scientific discovery is made. We will look at the results to find the secrets and to understand the story they are trying to tell us."

Floyd Melrose Retires After 40 Years with Department

In 1964, Floyd Melrose was driving a mail truck through the streets of Saigon during the Vietnam War.

In 2004, he retired from his fabrication technician post in the Department of Chemistry and Biochemistry.

"I didn't think I'd be here this long, but it's been a good fit," says Melrose. "The job has been very interesting. It's always been full of variety and you never know just what you are going to get into next."

Melrose's job has evolved with time. His original duty of ordering, maintaining and preparing chemical reagents for the laboratories has remained constant. Along with overseeing the stock room, he is charged with routine maintenance of all laboratory instruments and equipment. He is also the person the department turns to first when computers break down.

"I've done more with the instrumentation and maintenance through the years," he said. "I've gotten more involved with computers, too. It takes a lot of time keeping computers updated and virus free. Generally speaking, though, I keep things going and repaired in the laboratories so they are fully operational for the professors to use."

A major responsibility for Melrose is maintaining the six nuclear magnetic resonance spectrometers. Working on the same principles as magnetic resonance imaging machines in hospitals, the spectrometers are used to determine the characteristics of chemical molecules.

"If you don't keep the liquid nitrogen and liquid helium in them, they would lose their super conductive properties," pointed out Melrose. "It would cost tens of thousand dollars to have the service engineer come out and re-establish those properties in one instrument."

Professor and department head Jim Rice said Melrose has been a major reason why research and academic programs have grown in the last 15 years.

"As a faculty member, I know that I could never have accomplished the things that I have been able to without Floyd's help in maintaining my lab's instruments," Rice said. "As the head of the department these last five years, I know there is absolutely no way I could have kept the department running without his knowledge, insight and skills.

"He did it all with an indefatigable sense of humor and goodwill. In my years in the department, I can't ever remember him losing his temper or being out of sorts. And this isn't easy, given the occasionally intense nature of an academic department."

Born and raised in Canby, MN, Melrose enrolled at SDSU and began working as a student helper in the chemistry stockroom. But after two years of paying his own way, he dropped out of school to earn extra money.

Melrose took a laboratory job with the Cream of Wheat Co. in Minneapolis. However, the job didn't last long because, as he recalls, "the draft board called and said we need you,"

Stationed in Fort Bragg, N.C., Melrose was assigned to the 519 Military Intelligence Battalion and when his unit was shipped to Vietnam he worked as a mail clerk for the battalion.

When Melrose was discharged, he heard about a position in the chemistry department at SDSU. He was hired by late department head Victor Webster and began work as a chemical storekeeper on March 1, 1966.

"That's what they called it back then," said Melrose. "My job has kind of transformed and changed, but it has always been in the same place, doing pretty much the same things, only more."

Melrose never did have a chance to finish his degree, a fact he doesn't dwell on. "I liked what I was doing, but I suppose if I had gone on and graduated, I probably might have had a more important job," he said with a tongue-in-cheek grin.

Rice observed in the era of "portable careers," it's almost unheard of to spend four decades at one institution.

"When Floyd started in the department, I was eight years old. We have faculty members who weren't even born yet."

"People who are willing to make this kind of commitment to our institution are one of the things that makes SDSU a special place to work for and to go to school at," added Rice. "I hope it is a spirit that as an institution we never lose. We will all miss Floyd. It will be impossible to replace him."

Melrose, whose wife, Alyce, works part time in the SDSU English Department, doesn't plan to turn in his key, just yet. "I may have more time for leisure activities, like traveling, but I plan on coming back to work part time until they fill the position on a permanent basis."

Melrose has some simple words of advice for his successor: "If you like science and electronics, this is a good job."

Alumni News

Brenda (Hansen) Osborn

B.S. 1996

After graduating in December of 1994 with a major in Microbiology and a minor in chemistry I went on to complete a year-long internship at Mercy Hospital Medical Center in Des Moines, IA, after which I then graduated from SDSU in 1996 with a major in Clinical Laboratory Technology.

In September 1996 I began working at St. Mary's Healthcare Center Laboratory in Pierre, SD, and have been there ever since.

In July 1997, I married Scott Osborn from my hometown of Redfield, SD. We now have two sons, Jarod, age 5 years, and Ryan, 3 years. Scott will be returning soon from a nearly 14-month deployment to Iraq with the South Dakota National Guard and we will be very, very happy to be reunited with him.

Stephanie (Hull) Joens

B.S. 1999

Stephanie is an Environmental Scientist for Clark County Height District in Las Vegas, NV. She married Matt Joens, who is also an SDSU graduate. Matt is building a 38-story time-share tower for Hilton.

Jared Anderson

B.S. 2000

I will become an Assistant Professor in Analytical Chemistry at the University of Toledo effective this August. I had a very difficult decision in deciding between Toledo, San Diego State University and the University of Texas-Arlington. However, I think I made a very good decision as UT is developing a very strong program in bioanalytical chemistry.

Genliang Lu

Ph.D. 2002

I stayed at University of Kansas for more than two years with Dr. Helena Malinakova's group as a Postdoctoral Research Associate. I have published three articles in *JOC* and *Organometallics*. It is very helpful because that I got training at SDSU for my career. Now I am at the Department of Chemistry, Texas A&M University under supervision of Professor Kevin Burgess. My project is synthesis of 3'-O-modified-dNTPs to develop ultrafast sequencing-by-synthesis (SBS) technology for DNA sequencing.

Each newsletter will contain information on alumni and their activities. If you would like to share something about yourself and what you are doing, please send us a note and we will include it in the next issue. You can FAX to us at (605) 688-6364, e-mail us at James.Rice@sdstate.edu, and mail is always welcome.

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Scholarship and Award Winners

As of May 2005

For the 2005-2006 school year the Department of Chemistry and Biochemistry is providing over $20,000 in scholarships. The following awards were made at the annual Spring Commencement Awards Ceremony:

Departmental Awards

CRC Press Chemistry Achievement Award: Bethany Melroe

Phi Lambda Upsilon Award for Achievement in Organic Chemistry: Matt Small

Analytical Chemistry Award: Brian Carter

Merck Index Award: Benjamin Heitz

American Chemical Society – Certified Graduates: Jon Hansen and Kelly Kyro

Hypercube Scholar: Kevin Poenisch

Sioux Valley Outstanding Senior Award: Jon Hansen

Dobberstein Research Paper Award: Jon Hansen

Departmental Scholarships

Eugene Burr and Ella Burr Schultz Scholarships: Mitchell Dobberpuhl and Kathryn Engle

Elmer and Roberta Johnson Leaders of Tomorrow: (Incoming Majors) Mitchell Dobberpuhl and Thomas Smith (Continuing Majors) Julie Garry, Sherif Halaweish and Mathew Small

Olive Burke Crary and Gerald D. Crary Jr. Scholarship: Nicholas Gau

Herbert H. Hodgeson Award: Sharon Klein

Webster-Klug Award: Melissa Eng

Arthur W. Dobberstein Achievement Award: Courtney Wettlaufer, Whitney Wettlaufer and Tanya Grootwassink

Donald E. McRoberts Award: Kyle Stauter

Guss Memorial Award: Andrew Schieber and Khang Vo

Oscar and Elaine Olson Scholarship: Caitlin Berry, Jacci Hoffbeck, Lindsay Meier and Andrew Millar

Lloyd Baillie Award: Jeff Fahey

E. R. Binnewies Memorial Award: David Stevens

Joseph and Coral Bonnemann Scholarships in Medical Technology: Elizabeth Story

Chemistry T-Shirts

T-Shirts are Gold and White on SDSU Blue!

T-shirts: $15
Long Sleeve: $20.
There is an extra charge for XXL on up sizes.

Contact David Cartrette to purchase t-shirts at (605) 688-6480 or by e-mail at David.Cartrette@sdstate.edu.

Departmental News

Gabriela Chilom received the Certificate of Merit award for a first paper presentation which was judged outstanding for material content and for manner of presentation given before the Division of the 227th National Meeting. The award was presented at the 227th National ACS Meeting in Anaheim, CA.

Andrew Young was awarded the Joseph F. Nelson Graduate Scholarship for the 2004-2005 academic year. There were 11 scholarship applications for the one award for this year.

The Haskett Award winners for the 2004-2005 academic year were **Drew Budner** and **Marla Williams**. The award was established by the Hasketts to recognize excellence in teaching by a Graduate Teaching Assistant. The Haskett Award is presented at a departmental luncheon for graduate students at the beginning of the Fall semester.

Dr. Harry Hecht, Professor Emeritus and former department head, will have a chapter from *Reflectance Spectroscopy* by Wendlandt and Hecht, published by Interscience in 1966, reprinted in *A Theoretical Introduction to Diffuse Reflectance and Transmittance in Absorption Spectroscopy of Scattering Materials* by Donald J. Dahm and Kevin D. Dahm and being published by NIR Publications in the UK.

Recent Faculty Publications

Jihong Cole-Dai

Budner, D., and J. Cole-Dai. The number and magnitude of explosive volcanic eruptions between 904 and 1865 A.D.: Quantitative evidence from a new South Pole ice core, in Volcanism and the Earth's Atmosphere, Geophysical Monograph 139, edited by A. Robock and C. Oppenheimer, 10.1029/139GM10, pp 165-176, American Geophysical Union, 2003.

Brian Logue

Logue B.A., Kirschten N.P., Moser M.A., Petrikovics I., and Baskin, S.I. (2005) Determination of the cyanide metabolite 2-aminothiazoline-4-carboxylic acid in urine and plasma by gas chromatography-mass spectrometry. *Journal of Chromatography B* 819(2), 237-244

Logue B.A., Smith R.W., and Westall J.C. (2004) Role of Surface Alteration in Determining the Mobility of U(VI) in the Presence of Citrate: Implications for Extraction of U(VI) from Soils. *Environmental Science and Technology* 38(13), 3752-3759

Logue B.A., Smith R.W., and Westall J.C. (2004) U(VI) Adsorption of Natural Iron-Coated Silica Sands: Comparison of Surface Complexation Modeling Approaches to Modeling Adsorption on Heterogeneous Environmental Materials. *Applied Geochemistry* 19 (12), 1937-1951

Petrikovics I., Papahadjopoulos D., Hong K., Cheng T-C., Baskin S.I., Jing J., Jaszberenyi J.C., Logue B.A., Szilasi M., McGuinn W.D., and Way J.L. (2004) Comparing Therapeutic and Prophylactic Protection Against the Lethal Effect of Paraoxon. *Toxicological Sciences* 77, 258-262

Baskin S.I., Petrikovics I., Kurche J.S., Nicholson J.D., Logue B.A., Maliner B.J., and Rockwood G.A. (2004) Insights on Cyanide Toxicity and Methods of Treatment. In: *Pharmacological Perspectives of Toxic Chemicals and Their Antidotes*, Eds: Flora, S.J.S., Romano, J.A. Jr., Baskin, S.I., Sekhar K., Narosa Publishing House, New Delhi, India, 2004. ISBN: 81-7319-548-X

Jim Rice

Shang, C.; Rice, J. A., 2005, Invalidation of the use of the experimental structure factor maximum obtained by small-angle scattering to derive the interparticle distance in clay-water systems, *J. Coll. Interf. Sci.*, 283: 64-78.

Tremblay, L.*; Rice, J. A.; Kohl, S. D.; Gagné, J.-P., 2005, Effects of lipids on the sorption of hydrophobic organic compounds on geosorbents: a case study using phenanthrene, *Chemosphere*, 58: 1609-1620.

Berka, M.; Rice, J. A., 2005, Relation between aggregation kinetics and the structure of kaolinite aggregates, *Langmuir*, 21: 1223-1229.