

Tuesday, April 11, 2006

Chemical Engineers in the Pharmaceutical Industry Dr. Sue Behrens of Merck & Co.

April's event is our annual student awards dinner, where we pay homage to some of the top students in the local chemical engineering programs. Awards will be given out for the top sophomore, junior, and senior at the five local universities, along with the winners of the annual Zeisberg competition for the best chemical engineering reports. Admission fees for the award winners will be waived, and student admission will be half price.

Our speaker will be Dr. Sue Behrens of Merck & Co., Inc. Dr. Behrens has served in a number of roles at Merck since joining in 1990, most recently working to define a long-term supply chain strategy for vaccines and sterile pharmaceutical products. She will be speaking on the role of chemical engineers in the pharmaceutical industry. Dinner will include salad, entrée, and dessert. Please join as we celebrate another great year for students in the Philadelphia area. A reserved parking lot will be available and posted on website and marked at Drexel.

Dr. Susan Behrens received a B.S.

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Dr. Behrens has served in a number of roles at Merck since joining in 1990.

Meeting Date: April 11, 2006

Location: MacAlister Hall
Drexel University
3260 Chestnut Street
Philadelphia, PA 19104

Times:
6:30-7:00 Reception
7:00-9:00 Dinner, speaker, and student awards session

Cost: \$20 per person
\$10 per student
Mixed Green Salad with Vinaigrette Dressing, Roasted Herbed Chicken (Vegetarian Option Wild Rice Pilaf) Vegetables, Rolls and Butter, Dessert

RSVP: by Wednesday, April 5th via the website (www.aiche-philadelphia.org) or by contacting Eric Swanberg (267-377-0496, swanberg@member.aiche.org).

No shows will be billed unless cancelled prior to meeting.

Chair's Chat by Steve Wood

I, vaguely, remember being a student. My mind swam in equations, formulas, and theory. My practical knowledge, with the exception of a unit operations class and a summer internship, was limited. My first foray into a plant was scary and overwhelming. Attempts to map theories with pipes, pumps and equipment were near impossible. It was a scary time and transition. I am forever thankful to the engineers at the Air Products facility in Pasadena, TX who took me under their wings and showed me the way.

A key role for AIChE is to mentor and help students make the transition into the real world. As a local section, we have worked hard to foster this effort by increasing the level of interaction between our student members and senior members. In particular, Rowan (thank you, Dr. Hesketh!) has really stepped up by encouraging students to attend events and interact with AIChE.

This month provides a great opportunity for our members to meet some of the many talented students in Greater Philadelphia. Our annual students awards banquet will celebrate the talents of our future leaders. We hope that you join us at Drexel in April at our last event of this season. We hope you come out to help us develop the future of the chemical engineering profession

Send our ChemE Car Student Team to Annual National Meeting

Philadelphia's Local Section Announces a new \$500 Prize for ChemE Car Competition. Rules for Prize.

An annual \$500 prize is split among the student chapters that are located in our section (Drexel, UPenn, Rowan, Villanova & Widener) and whose ChemE Car qualifies to compete at the AIChE Annual Meeting. For example, if ChemE Cars from UPenn and Drexel qualify for the Annual Competition then the prize is \$250 each. If no cars qualify then there is no prize that year and the \$500 builds up the endowment.

Chem E Cars qualify in competition (top 5 cars qualify) at the Annual Spring Mid-Atlantic Regional Conference for Students (early April). Our prize is accepted on behalf of the student chapter by the faculty advisor or designee at DVS AIChE Student award night (late April). The prize money is intended to defray the travel cost to compete at the Annual National Meeting (following November) however this is not a requirement and the student chapter is free to spend the money as it sees fit.

The Philadelphia / Del Val Local Section of AIChE set up a Student Award Fund in 1998 for the purpose of sending students to the Annual National Meeting. The fund, rules and prizes are managed by the Local Section Officers. The Student Award Fund is supported by local section dues and the hope is that this endowment will grow to be self sustaining in the future. This year, 2006, is the first year that this ChemE Car prize is awarded. The Student Regional Conference is at Penn State on Saturday April 8th and the Del Val Section of AIChE's *Student Awards Night* is at Drexel on Tuesday evening, April 11th.

Example of a ChemE Car from a past competition, this was a 2 reaction car from SUNY University of Buffalo.



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CHEMICAL CONSULTANTS NETWORK

April 5, 2006 , Meeting

Visit our web page at www.chemconsultants.org

Date & Time: Wednesday, April 5, 2006 at the Cynwyd Club, Bala Cynwyd, PA; Networking, 5:30 PM; Dinner, 6:30 PM; Talk and Business Session, 7:30 PM. **Please note that this meeting is on the FIRST Wednesday of the Month.**

Speaker Topic:**Seven Deadly Sins Committed by Technology Start-ups in Raising Institutional Investment****Dr Patrick J. Foley, Jr.**

Abstract: After a brief discussion of the characteristics of venture capital, and particularly early stage venture capital, Dr. Foley will review the various aspects of a start-up business plan that VC firms pay particular attention to.

Location: The Cynwyd Club, 332 Trevor Lane, Bala Cynwyd, PA 19004.

From City Line Ave. (Route # 1) drive north on Conshohocken State Road (Route # 23) about 3 long blocks. Continue north on Trevor Lane instead of following Route #23 left. At "Y" in road one block north on Trevor Lane turn left where clubhouse and parking are on the left side of the road. Please park in lot if space is available; otherwise park on Trevor Lane. If lost, call the club at 610-667-4524.

Reservation: To make or cancel a dinner reservation, e-mail CCNReservations@aol.com or call the ACS office at 215-382-1589 (leave message on voicemail if necessary). Fee, including food and beverages, is \$35. Early Bird discount price is \$ 25 if reserved by the Thursday before the meeting. Late reservations and walk-ins subject to availability. No-shows will be invoiced.



Photo of Rowan chemical engineering faculty and students in attendance at the Philadelphia / Del Val AIChE dinner meeting February 16th at the Iron Hill Brew Pub in North Wales PA. Brian Lange PE, Director of Engineering Sterile & Packaging Operations for Merck West Point was the speaker. Brian's topic was vaccines and he compared, step by step, beer and vaccine production and packaging.

Pictured top right by himself is John Roszko. The second row down starts with Dr. Lefebvre , Kyle Smith, Dave Schumann, Nick DeSantis, and Tom Luesner. The bottom row is Dr. Hesketh, Henry Ip, Dan Duffield, Dean Dodaro, and Don Kessler.

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Dr. Sue Behrens

(Continued from page 1)

in Chemical Engineering from the University of Michigan and completed her Ph.D. at the University of California at Berkeley.

Sue joined Merck in 1990 in Technical Operations in Elkton, VA providing process development and manufacturing support for antibiotics, lovastatin and large-scale fermentation of cephalosporin intermediates using a novel biosynthetic route. She transferred to Merck Research Labs, leading the manufacture of clinical supplies for sterile and liquid products, before returning to MMD in Process Engineering supporting new product development and environmental projects for API manufacture.

As Senior Director, Sterile Process Technology and Engineering, Dr. Behrens directed technical support for sterile pharmaceutical and vaccine products including technology transfer for new vaccines and design activities for the new Vaccine Manufacturing Facility in Durham, NC. Her most recent assignment was leading a group in Regulatory & Analytical Sciences–Biologics which was responsible for regulatory support for Live Virus vaccines and Operational Excellence initiatives to improve bioanalytical method business processes.

Dr. Behrens recently transitioned to an operations role for the purpose of defining a long-term supply chain strategy for vaccine and sterile pharmaceutical products to meet the needs of Merck's growing product portfolio

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Using Calorimetric Data to Assess Exothermic Reactions Eric A. Sipe, Project Manager, CDI Life Sciences

Highly exothermic reactions such as hydrogenation and oxidation reactions pose special risks for chemical manufacturers. These highly exothermic reactions present the special risks of runaway reaction, rapid gas evolution, and vessel overpressurization or rupture. Therefore heat generation rate information for such reactions must be determined in order to design appropriate cooling and safety systems for batch chemical reactors. This heat generation rate information can be determined under isothermal, adiabatic, or isoperibolic conditions. This is where calorimeters come into the picture.

Calorimeters are small-scale (1-2L) process vessels with precision heat transfer measurement and control systems. These small-scale process vessels can be used to simulate highly exothermic oxidation, hydrogenation, or nitration reactions under normal or abnormal operating conditions. By simulating these potentially dangerous reactions on a small scale in high pressure rated equipment, the base criteria for production scale equipment can be determined. Important criteria such as cooling requirements for removal of heat of reaction, pressure rating for containing over-pressure events, and vent gas/liquid flow rates for relief scenarios can be determined by performing calorimetric testing. After this important data is determined for small scale processing in the calorimeter it can be extrapolated to define production scale processing requirement for equipment, controls, and safety systems. Extrapolation of the calorimetric data will need to be done in order to design an appropriate cooling scheme for the highly exothermic reaction. Additionally, the data will need to be extrapolated in order to define the required pressure rating and pressure relief requirements for the production scale reaction system.

You may ask, how does one go about getting this critical information for a highly exothermic reaction? This information can be developed by in-house chemical development groups or by outside firms that specialize in this type of technology. In-house chemical development groups and/or outside firms specializing in chemical reaction hazards should be consulted when embarking on the formation of a new chemical entity or the modification of an existing chemical synthesis pathway, especially if the chemical synthesis pathway involves any highly exothermic reactions. These groups will be able to develop specific testing requirements for the new chemical processes so that all appropriate process hazard information is acquired as part of calorimetric testing. Further, it is likely that the in-house chemical development group will already have knowledge and experience with preliminary work of the new chemical synthesis process that will be invaluable in taking the new process from the lab to the plant floor.

Calorimeters seem like a valuable tool for assessing highly exothermic reactions but are there other unit operations that can be simulated in these devices? Yes, calorimeters can also be used to collect critical processing information for distillation and crystallization operations as well. Batch distillation and crystallization processes can be performed and monitored in these systems. Additionally, these calorimeters can usually be equipped with in-line sensor that give real time information on the distillation or crystallization operation.

So, the next time you are considering a change to your chemical process consider what benefits you might derive from performing some development work in a calorimeter. This information will lead you to a safer and more efficient chemical synthesis pathway and thus the appropriate design for the chemical processing system.

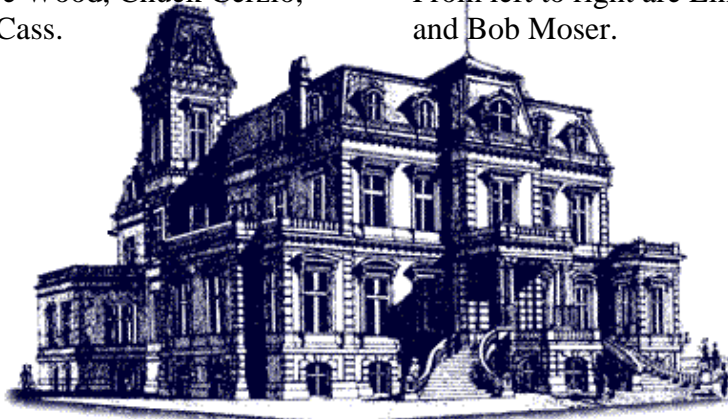
AICHe DVS CEO Lecture Series at The Union League



From left to right are Steve Wood, Chuck Cerzio, Ajit Ghorpade, and Wyll Cass.



From left to right are Linda Tamburro, Ken Rollings, and Bob Moser.



From left to right are Dave Rosenthal and Professor Slater

From left to right are Carlos Martin, Bill Celenza, Barry Juran, Prahakar Sharma, and Jeff Kerner.



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Section Administrative Announcement

Attention Members of the Delaware Valley Section of AIChE:

Notice of Annual Meeting
May 2nd at Villanova University at 6 pm
Action will be taken including:

1. Election of Officers
2. Amendment of Section By-Laws

Please Register on the Events page at www.aiche-philadelphia.org or call Steven Wood at (609) 243 7908

Professional Development Chair	Mark DeLuca, PE Phone: 215-752-1619 Web Address: www.del-engineering.com Email: engineer@del-engineering.com
Student & Recent Graduate Coordinators	Eric Swanberg Phone (Work): 215-628-5146 Phone (Cell): 267-377-0496 Email: swanberg@member.aiche.org
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Mail address corrections to Data Base Manager at above address .

Our Files are continually updated with your input and membership information from AIChE Headquarters.

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