KNOXVILLE-OAK RIDGE SECTION
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

Newsletter **April 1999**

Chair:	David DePaoli	574-6817	ddi@ornl.gov	**Directors:**	Hank Cochran	574-6821	hdc@ornl.gov
Vice-Chair:	Jan Berry	241-1939	vnb@ornl.gov		Steve McCoy	220-4730	mccoys@ttnus.com
Secretary:	Saleem Zwayyed	690-3211	szwayyed@ITCRP.COM		Ken Plummer	574-7069	pek@ornl.gov
Treasurer:	Thomas Klasson	574-6813	kt9@ornl.gov		Paul Taylor	574-1965	tap@ornl.gov
					Tse-Wei Wang	974-6769	twang@utk.edu

April Meeting

Date: Tuesday, April 23, 1999
Place: The Foundry at the World's Fair Site

6:00 p.m. Executive Committee Meeting
7:00 p.m. Buffet Dinner:
- Salad
- Vegetarian Lasagna
- Lemon Herb Chicken w/Rice
- Turned Red Skin Potatoes
- Vegetable Medley
- Rolls and Butter
- Coffee and Tea
- Fruit Cobbler w/Ice Cream & Sundae Toppings

8:00 p.m. Program:
- Awards: Engineer of the Year, UT Chemical Engineering Students
- Featured Presentation:

INDUSTRIAL EXAMPLES OF PROCESS SYNTHESIS AND INTEGRATION
Jeffrey J. Siirola
Technology Fellow, Eastman Chemical Company
and AIChE Director

Cost: $15, students free

Reservations:
We must make a guarantee on our number of attendees on Friday, April 23. Please make your reservation by noon, April 23 with Sancy Hail 974-2421 or Linda Puckett 574-2210; fil@ornl.gov.

PEs: PDH Certificates will be available at meeting

Contacts

Awards
Hank Cochran
(574-6821; hdc@ornl.gov)

Incineration Symposium
Saleem Zwayyed
(690-3211; szwayyed@ITCRP.COM)
Jan Berry
(241-1939; vnb@ornl.gov)

Membership
Paul Taylor
(574-1965; tap@ornl.gov)

Outreach
Tse-Wei Wang
(974-6769; twang@utk.edu)

Professional Development
Steve McCoy
(220-4730; mccoys@ttnus.com)

Publicity
Tse-Wei Wang
(974-6769; twang@utk.edu)

Section Bylaws
Ken Plummer
(574-7069; pek@ornl.gov)

Section Web Site
Thomas Klasson
(574-6813, kt9@ornl.gov)

WATTec
Bob Hightower
(574-6777; jrh@ornl.gov)

April Program

INDUSTRIAL EXAMPLES OF PROCESS SYNTHESIS AND INTEGRATION

Jeffrey J. Siirola
Technology Fellow, Eastman Chemical Company
and AIChE Director

Abstract

Systematic process synthesis methods have been under investigation for thirty years with several techniques now developed to the point of serious industrial applicability. This seminar will describe a number of industrial applications of the task-oriented systematic generation process synthesis approach, illustrating in particular the impact of task integration concepts including complementary task integration, consecutive task integration, task coordination, and synergistic technology integration.

Recap of March Meeting

The March meeting, held at Leaf & Ale in the Cedar Springs Shopping Center, was a hands-on demonstration of bioprocessing. Mike Nelson of Leaf & Ale, an expert in home brewing, led the class through the brewing of a batch of beer. The main carbon source for the bioreactions was 5.5 lbs of fermentable sugar, obtained from a can of hopped malt extract syrup Stone Mountain Lager) and rice syrup solids (used in place of malt extract for this batch to make it a light, drinkable beer for the warmer months). These items were added to 1.5 gal. of boiling water. An interesting tip: a bag containing 1/4 lb each of dextrine malt (for body), Munich malt, and wheat malt (for head retention) was placed in the cold water to steep, and removed at boiling. (For oatmeal stout, you would place plain oatmeal in the bag). The resulting mixture, called "wort", was boiled for 10-15 min, then transfered to a sanitized fermenter containing 3 gallons of cold water. As with all bioprocesses, everything that comes in contact with the solution must be sanitized; this is commonly done by soaking in a bleach solution of 1 oz. bleach per gallon of water. Once the solution had dropped below about 80°F, the biocatalysts were introduced to the reaction vessel. In this case, yeast from a steam beer (California lager) was used. This yeast is used to give good crisp flavor when fermenting at approximately 60°F. As with other bioprocesses, temperature control is critical to avoid unwanted products. Ales are fermented quickly at warmer temperatures. For lagers, cooler temperatures are desirable; the fermentation is slower, but less esters (which introduce off-flavors) are produced. The batch will be held for about 2 weeks in the primary reaction vessel, then (since this is a lager rather than an ale) transferred to a secondary vessel for lagering in a refrigerator for 5 weeks. At that point, the beer will be ready for bottling. Mike invites those who participated to stop by and sample the product of the class when it is ready around May 1. For those who are interested in learning more, Leaf & Ale has a good selection of raw materials and bioprocessing equipment and offers classes periodically. More information, including recipes, can be found at their web site: www.leafandale.com.

Incineration Symposium

"Quiet Discussion of a Hot Topic"
May 17 & 18, 1999
Holiday Inn Cedar Bluff

Through the effort of Hank Cochran, our section won Public Outreach funding from AIChE national to put on a symposium on incineration. Planned primarily by Saleem Zwayyed and Jan Berry, this two-evening symposium is intended to provide a forum for informed discussion among public, the press, technologists, risk assessors, regulators, and interested chemical engineers about the use of incineration for waste disposal. It is intended that the six expert speakers will address issues of incineration at a level appropriate for a general audience. The Symposium will close with a panel discussion and open forum. This is not an appropriate forum for public demonstration or protest. The preliminary program:

Monday, May 17, 1999

Speaker # 1: Roy F. Nelson (IMCO)
Topic: Medical Waste Incineration
Speaker # 2: Fidel Perez (TSCA Incinerator)
Topic: Mixed Waste Incineration
Speaker # 3: Prakash Acharya (The IT Group)
Topic: Thermal Desorption
Speaker # 4: Mark Walker (Focus Environmental)
Topic: Hazardous Waste Incineration

Tuesday May 18, 1999

Speaker # 5: Dr. Randy Seeker
Topic: Risk Assessment
Speaker # 6: Jamie Wright (Bechtel Jacobs)
Topic: Regulation of Incineration

Panel Discussion and Open Forum
Moderator: Tony Eicher (Focus Environmental)

More details on the program and reservations will be made available in the near future.

Volunteers are needed to help conduct the symposium. If you wish to help out, please contact Saleem (szwayyed@ITCRP.COM, 690-3211) or Jan (241-1939, vnb@ornl.gov)

Local Section Awards

The Technical Achievement award was presented at the March meeting to Charles Forsberg. Charles was cited for "original research and inventions on advanced waste management systems based on geochemical and thermodynamic barriers to prevent the release of radionuclides to the environment."

The Engineer of the Year award will be presented at the April meeting. The name of the recipient of that award is displayed with the previous winners in the Dougherty Building at UT.

A&WMA Meeting

The East Tennesse Chapter of the Air & Waste Management Association invites AIChE members to their lunch meeting on **Friday, April 23 at 11:30 a.m.**

Location: Sagebrush Steakhouse & Saloon, 390 South Illinois Ave., Oak Ridge.

Speaker: Mr. Grady Ray, Area Supervisor, Field Services Section, Tennessee Division of Air Pollution Control, Tennessee Department of Environment and Conservation.

Mr. Ray will speak on Tennessee's Title V Permit inspection program. Mr. Ray is the Area Supervisor responsible for East Tennessee.

Meals will be ordered individually off the restaurant menu.

Deadline for making reservations is April 21. To make reservations, call Mark Walker at (423) 694-7517 or e-mail to: mhwalker@focusenv.com.

Tennessee's Technology Summit

Tennessee's Technology Summit of 1999 will be held June 1-3 at the Holiday Inn-World's Fair Park in Knoxville. The Summit will combine a 4-year continuation of the Annual Corridor Summit and the 26th Annual WATTEC Technology Conference. This year's Summit theme is "Showcasing Our Technology for Economic Development."

AIChE is sponsoring two sessions during the meeting; a lineup of talks for one of the sessions is given below; details of the other will be printed in the May newsletter.

Recent Trends in Chemical Engineering Research and Education with Economic Potential (2-5 p.m., June 3; Chair:Tse-Wei Wang)

1. Molecular Simulation of Complex Systems Using Massively Parallel Supercomputers
Peter T. Cummings, University of Tennessee and Oak Ridge National Laboratory

2. Process Monitoring and Fault Diagnostics Using Multivariate Statistical Process Control Approach
Tse-Wei Wang, University of Tennessee

3. An Honors Capstone Design ExperienceUniversity-Industry Cooperative
R. M. Counce, University of Tennessee

4. A General Approach for the Economic Analysis of a Waste Minimization Pathway - ACase Study
William Rains, University of Tennessee

5.Use of Advanced Photonics for Treatment of Disease
Timothy C. Scott, Photogen Technologies

6. An Overview of Chemical Process Manufacturing
Alan Zimmerman, Oak Ridge Center for Manufacturing Technology

More information on the Summit can be found at **http://www.korrnet.org/wattec/**

Section Web Resources

Home Page: http://www.ornl.gov/aiche/

e-mail: aiche-chat@chem.engr.utk.edu
(directions: http://www.ornl.gov/aiche/mail.htm)

see the new local job postings page!

Section Contributes to Science Fair

Knoxville-Oak Ridge AIChE section recently supported the Southern Appalachian Science Fair. The section awarded 4 $50 cash prizes at the Fair, 2 to junior and 2 to senior division entries. Hank Cochran and Tse-Wei Wang selected the recipients. The winners are:

Junior division:

1. Entry 127: *Eat your Energy*, by Jenna Carignan, an 8th grader at St. Mary's School
Pieces of several different kinds of foods were burned and the released energy was measured by a home-made calorimeter, in order to determine which foods contain more energy.
2. Entry 152: *Rustbusters*, by Shane Strunk, a student at Sacred Heart Middle School
A metal bar was immersed in each of 3 jars of water with bacteriacide added to 2 of the jars at different concentrations while the third served as a control. The objective was to see if the presense of bacteria accelerate the formation of rust. The results appear to suggest yes.

Senior Division:

1. Entry 301: *Do you know your own Wood?* by Ryan Sutton of Oliver Springs High School
Different types of hard wood (same mass amount) were burned. The temperature achieved, the amount of ash and residue left behind after complete burning were measured and compared to see how they compare to each other.
2. Entry 293: *How much time is in your gas tank?* by Joshua Eslinger of Carter High School
10 ml of each of three grades (octane wise) of gasoline was used to power a small engine to see if the duration of the fuel is dependent on its octane rating. The finding suggests, no.

Knoxville-Oak Ridge Section
American Institute of Chemical Engineers
P.O. Box 2008, Bldg. 3017
Oak Ridge, TN 37831-6044

Group Exemption No. 2602
Tax exempt under Section 501 (c)(3)
of the Internal Revenue Code of 1954

April 1999