

AIChE



The Catalyst

PITTSBURGH CHAPTER
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS



Volume 16 Issue 7



April 2002

APRIL MEETING NOTICE

Joint Meeting with the Association of Energy Engineers

Tour of the Duquesne University Turbine Plant

- When:** Tuesday, April 16, 2002
- Time:** 5:00 pm Meet in Room #613 of the Student Union
5:30 pm Dinner followed by facility tour
- Cost:** \$20.00 for AIChE and AEE members
\$25.00 for non-members

Directions: www.aee-westpa.org

**FOR APRIL MEETING,
RSVP NO LATER THAN
THURSDAY, APRIL 11, 2002**

TO:
Ms. JoAnn Truchan, Vice Chair
Tel 724-695-1945
Email: cricket.jt@att.net
PLEASE PAY AT DOOR

Name _____
Menu Selection _____
Email _____
Phone _____

CANCELLATIONS If you must cancel your meeting reservation, please do so no later than 24 hours prior to the meeting. If you do not provide a cancellation notice, you will be invoiced for the cost of your meal.

About the Plant Tour

The Duquesne University Turbine Plant is a natural gas-fired cogeneration plant. The 5 mega-watt electricity generation facility supplies electricity, hot water, heating, and cooling to the university.

Visit the AEE website www.aee-westpa.org for complete details, or contact JoAnn Truchan (412-578-7981; cricket.jt@att.net) for additional information.

PLAY BALL AUGUST OUTING

PLEASE JOIN US IN CHEERING ON THE PIRATES

Friday Night, August 16, 2002 "Fireworks Night"

Tickets are \$24.00 each and are located in Section 130 (left field boxes) row "A".

Bring your ball gloves because we are just about on the field of play!

Come and celebrate before the game!

Picnic Area in Center Field Food / Beverage Buffet. The cost per person for the food picnic is \$26.00 (in addition to baseball ticket) and this is for the all you can eat buffet and soft drinks.

**RSVP by May 10, 2002 to
Michael P. Flaherty
412-889-2060
michaelp871@hotmail.com**





MEMBERSHIP CORNER

CHAPTER ELECTIONS NOMINATIONS ARE BEING ACCEPTED

There are currently two officer positions open for the 2002-2003 Program Year. Self-nominations are accepted.

- ❖ **Vice Chair**, responsibilities include coordinating the monthly programs for the 2002/2003 season. The Vice Chair must also commit to holding the position of Chair in the 2003/2004 season.
- ❖ **Counselor**, responsibilities include providing advice to the executive board concerning section business. The Counselor holds office for 2 years. Generally counselors have been active members in the section and help to offer continuity in the sections activities.

Deadline for nominations is **Friday, April 19, 2002**

Submit to Mr. Ed Moretti
Baker Environmental
emoretti@mbakercorp.com
412-269-6055

Please sign me up for the local Pittsburgh Section of AIChE

Name _____
Company _____
Address _____
City _____ State _____ Zip _____
Business _____
Residence _____
Email _____

Annual Dues are \$16.00. Make check payable to "AIChE Pittsburgh Section" and send to our Treasurer: **Leigh Anne M. Wacker, CFX Software & Services, Omega Corporate Center, 1260 Omega Drive, Pittsburgh, Pennsylvania 15205**

Dear Members,

We are constantly updating our membership database. Please send all change of address notifications to me at

Ashley Smith
Industrial Design Corporation
200 Corporate Center Drive, Suite 200
Moon Township, PA 15108
ashley.smith@idc-ch2m.com

Thanks to all of you for supporting the Pittsburgh local section by volunteering your time to attend meetings and volunteer for the numerous AIChE sponsored activities. I look forward to seeing everyone at this year's activities!

Regards,
Ashley Smith
Membership Chair

HUMOR

Thanks Carl for your contribution and advice:

1. Never give yourself a haircut after three margaritas.
2. You need only two tools: WD-40 and duct tape. If it doesn't move and it should, use WD-40. If it moves and shouldn't, use the duct tape.
3. The five essential words for a healthy relationship are: "I apologize" and "You are right."
4. Everyone seems normal until you get to know them.
5. When you make a mistake, make amends immediately. It's easier to eat crow while it's still warm.
6. The only really good advice that your mother ever gave you was: "Go! You might meet somebody!"
7. If he/she says that you are too good for him/her--believe them.
8. Never pass up an opportunity to pee.
9. If you woke up breathing, congratulations! You have another chance!
10. Work is good, but it's not that important.



CHAPTER ANNOUNCEMENTS

INTERESTED IN HOSTING AN AIChE MEETING AT YOUR COMPANY?

We are in search of hosts for our future AIChE monthly meetings. The Chapter is looking for companies that can provide AIChE members with an interesting, informative, and beneficial agenda. If your company would be interested in hosting a meeting please contact me.

Also, if you have a topic or an idea that you would like to see presented at a monthly meeting, please feel free to contact me and we can discuss your idea.

*Mr. Michael Flaherty, Chair
WSP Chemicals & Technology Inc.
Tel 724-266-7688 ~ Fax 724-266-7683
Email Michaelp871@hotmail.com*



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CARNEGIE MELLON

COLLOIDS, POLYMERS AND SURFACES PROGRAM PART-TIME GRADUATE STUDIES

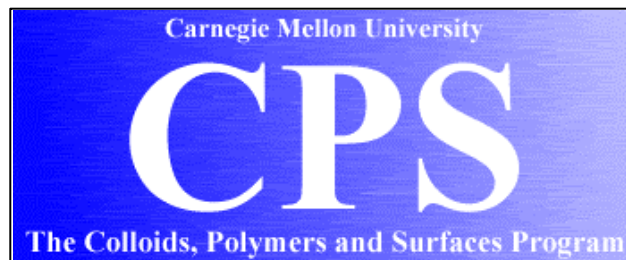
This interdisciplinary program of part-time graduate study (currently in its 29th year) leads to a *Master of Science degree in Colloids, Polymers and Surfaces (CPS)* offered jointly by the Engineering and Science Colleges at Carnegie Mellon University. It is also possible to earn a combined masters degree in CPS and Chemical Engineering.

Course work is relevant to many industries as chemical product manufacture and process developments often require application of principles of colloid, polymer and surface science. Some examples include industries working with coatings and pigments, pharmaceuticals, surfactant-based products, food science, cosmetics and personal care products, environmental science, pulp and paper, fiber/textiles, polymer and composite materials. Participating faculty are drawn mainly from the Department of Chemical Engineering and the Department of Chemistry

Applications for Fall 2002 enrollment are now being taken. Courses are offered in the evening hours. Classes begin **August 26, 2002** and new students may enroll in the entry-level course, Physical Chemistry of Macromolecules.

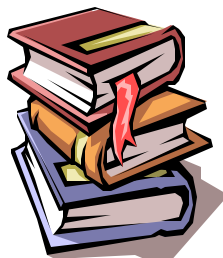
For additional information, contact:

Dr. Annette M. Jacobson
Director, CPS Program
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Phone: (412) 268-2244 E-mail: jacobson@andrew.cmu.edu
www.cheme.cmu.edu/cps/





PROFESSIONAL PROMISE AWARD WINNERS



CONGRATULATIONS!!

Congratulations to these year's Professional Promise Award Winners. Their professors and peers have selected them to be honored as the most outstanding senior in their class.

The AIChE Pittsburgh Chapter wishes you continued success with your future endeavors. We encourage you to become active members in our Chapter.

Carnegie Mellon University: Eric Miller

University of Pittsburgh: Dennis Young, II

West Virginia University: Jason Gaspar

Youngstown State University: Gregory Panuccio



Our CMU and WVU winners accepting their plaques and monetary gifts.

PITTSBURGH FUTURE CITY COMPETITION

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA



**NATIONAL ENGINEERS WEEK
FUTURE CITY COMPETITION 2002**

The AIChE Pittsburgh Chapter once again donated a Special Award in an effort to encourage and educate our youth about engineering. This year's topic was

Most Creative Use of Recyclable Material

Congratulations to

Wendover Middle School!



We applaud your hard work and dedication.



**ENERGY RESEARCH****THERMODEPOLYMERIZATION OF CELLULOSE
AND CELLULOSE-DERIVED MATERIALS TO
PRODUCE A FUEL GAS FOR ENERGY
PRODUCTION**

Matthew Thomas, Gregory Panuccio, and
Douglas Price
Department of Chemical Engineering
Youngstown State University
Youngstown, Ohio

Abstract

Current bioenergy technology has the potential to make renewable farm and forestry resources major sources of electricity and fuel. Advances in these areas can create an expanding array of exciting new business and employment opportunities for farmers and foresters in states with a strong agricultural and forestry base.

The production of electricity from biomass has been demonstrated commercially by co-firing of wood with coal or the gasification of wood by partial oxidation with subsequent burning in a power plant.

Thermodepolymerization of wood or other biomass to produce a fuel gas is an attractive alternative to co-firing and gasification in that there is negligible energy spent on drying the biomass. The utilization of biomass-derived fuel for the production of electricity will reduce the dependence on fossil fuels, eliminate the production of greenhouse gases, and reduce the generation of acid rain chemicals, namely sulfur dioxide and nitrogen oxide compounds. The reduction of acid rain chemicals is tantamount in reversing the damage to wilderness areas of the northeastern regions of the United States.

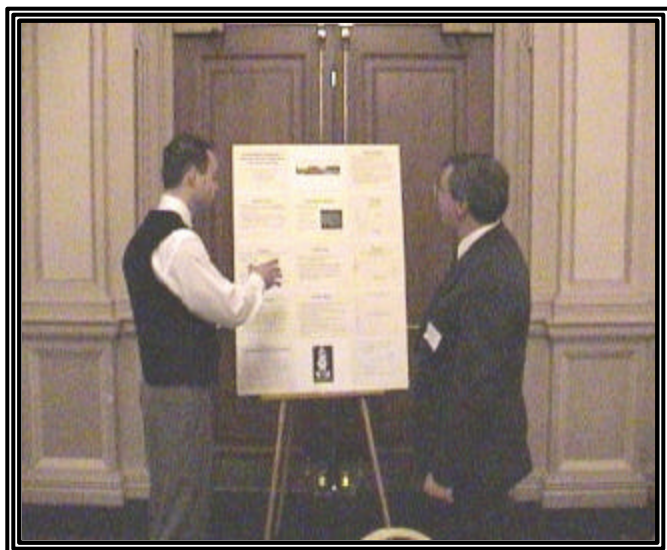
The application of thermodepolymerization to produce a medium energy fuel gas (350 to 500 Btu/standard cubic foot) from biomass and byproducts from the manufacture of pulp and paper is a new technology that has not yet been demonstrated. This technology produces fuel gas under wet conditions, thereby eliminating the energy spent on drying the material. The potential energy savings by this process compared to co-firing or gasification range from 3% for ash to as high as 24% for willow.

Preliminary research at Youngstown State University began in September 2001. The work studied the kinetics of the thermodepolymerization of *salix* (willow) and the qualitative composition of the product gas. The temperature/time dependence on the decomposition of wood solids has been fully determined and the investigation revealed that there is a two-step mechanism in the production of fuel gas. The first step is the solvation of the wood into the aqueous solution. This step is quite rapid. A second, and slower step, involves the breakdown of the dissolved solids into gaseous components. This second step is not well understood at this date and further research is required to determine the



proper time/temperature relationship for the production of the fuel gas. A single measurement on the product gas showed that it is primarily hydrogen and carbon dioxide. The presence of hydrogen may expand the potential marketability of the process in that it is the most desirous fuel for fuel cells.

The benefits of this research will provide a technology where electricity can be produced fueled entirely on biomass-derived fuel gas. As little as 1,000 acres of land dedicated to producing willow for fuel gas can provide enough fuel for a 400 to 670 kilowatt electrical generating facility using microturbine generators that can provide power to meet the electrical demands of up to 225 homes. The cost of biomass will range from \$0.0085/KWH at a payment to the crop grower of \$50/acre/year to \$0.028/KWH at a payment to the crop grower of \$100/acre/year.





NEWSLETTER DEADLINE

THE DEADLINE FOR THE JANUARY NEWSLETTER IS
APRIL 16, 2002.

Please submit information to
Peggy Panagopoulos at
ChemTech Consultants
1370 Washington Pike, 4th Floor
Bridgeville, PA 15017
pegpana@chemtech88.com or Fax: 412-221-5685

HOT NEWS

TO SLEEP, PERCHANCE TO DREAM?

According to the American Association for the Advancement of Science, sleep helps us "rehearse, restructure, and reclassify our existing world view, to allow us to function better." The American Cancer Society, on the other hand, reports that excessive sleeping (more than eight hours) may increase the risk of early death by up to 15%. What's a person to do? Try sleeping on it.

<http://www.nature.com/nsu/news.html#news>

Over sleepers may die early

'Sleeping your life away' could be more than a saying.
15 February 2002

VIRGINIA GEWIN

Excessive sleeping may increase your risk of an early death by up to 15%. So hints a new analysis of data collected on one million people by the American Cancer Society. The figures cast doubt on the reputed benefits of eight hours' sleep a night.

People with the longest lives get only seven hours of sleep each night, find psychiatrists at the University of California, San Diego¹. Why seven is the magic number is not clear. And sleeping more appears to be riskier than sleeping less. On the short side, increased mortality kicks in only when you get below four hours.

This unprecedented peek into the habits of so many people claims to be the first to determine the relationship between sleep and mortality, while controlling for other factors such as weight, smoking and exercise.

Currently, the average American gets about six-and-a-half hours sleep, much lower than the standard

recommendation of eight hours. The new analysis suggests that patients may seek treatments unnecessarily in attempts to attain the eight-hour target.

"If people don't sleep eight hours, they have nothing to worry about," says Daniel Kripke, a member of the team.

Insomniacs, the data suggest, have no greater risk of premature death. Sleeping pills, in contrast, might just shave some days off your life. Kripke's group plans to conduct experiments to determine whether setting the alarm clock can lengthen survival.

But critics of the study hope it will not be over-interpreted. They point out that the enormous data set - part of a cancer prevention study in the 1980s - was not specifically designed to analyze sleep. Insomnia was not defined, sleeping pills were not identified, and those surveyed reported their own sleep behavior in one-hour increments, leaving little room for fine detail.

"I do not think there is a specific survival advantage to short-changing ourselves from sleep," says Daniel Buysse, a sleep specialist at the University of Pittsburgh. More targeted studies are needed to explore the implications of excess sleep, he adds.

And there are trade-offs to consider. Cranky moods, heightened susceptibility to disease, and glucose intolerance are just some of the side effects of sleep deprivation that diminish quality of life, even if they don't cause early death.

References

1. Kripke, D.F., Lawrence, G., Wingard, D.L., Klauber, M.R & Marler, M.R. Mortality associated with sleep duration and insomnia. *Archives of General Psychiatry*, **59**, 131 - 136, (2002).

GET IN THE SWING

This spring, take to the green with engineered drivers that will make them cry. New drivers use molded titanium for greater speed, extra stability, and the elimination of soft spots. <http://www.popsci.com/popsci/>.

START YOUR ENGINES: ANNUAL MEETING CALL FOR PAPERS

Is open only until April 19. The meeting is November 3-8, in Indianapolis, Indiana. Submit your proposal online at <http://www.aiche.org/annual/>.





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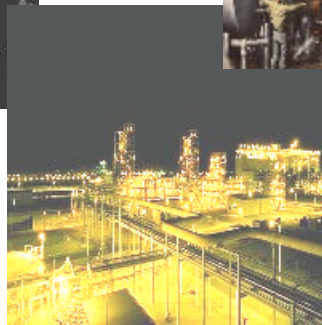
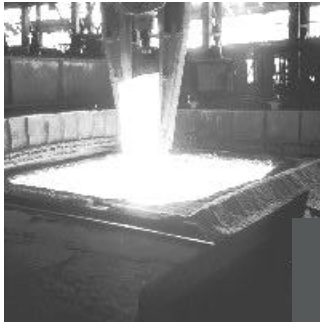
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Email pegpana@hotmail.com



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