Madison Section NEWSLETTER

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Generation of Hydrogen via Liquid-Phase Reforming of Carbohydrate-Derived Oxygenated Compounds

Date/Time: Thursday, October 17, 2002, 11:45 AM - 1:00 PM
Speaker: Dr. Randy D. Cortright, Department of Chemical Engineering, University of Wisconsin-Madison
Location: Rocky Rococo's Pizza, 7952 Tree Lane (Madison Beltline Hwy. at Mineral Pt. Rd.), 608.829.1444
Menu: Pizza buffet, salad and soft drinks (cost $10.00, free for student members)
RSVP: by October 14th to Tom Yager via email (tyager@ieee.org) or call 608.821.0821 ext. 342

Non-member guests are always welcome!

Changes in global energy production toward a "hydrogen society" are predicted to have important economic and environmental benefits, since water is the only by-product from power generation using hydrogen fuel, and hydrogen can be produced from renewable biomass sources. We have found that it is possible to generate hydrogen at temperatures near 500 K via the aqueous-phase, catalytic reforming of biomass-derived oxygenated compounds, such as ethylene glycol, glycerol, sugars and sugar-alcohols. This method takes advantage of the unique thermodynamic properties of these oxygenated compounds that allow complete reaction of these compounds with water to form H2 and CO2 at temperatures near 500 K. At these conditions this aqueous-phase reforming process generates hydrogen without the need to volatilize water, which represents a major energy saving compared to conventional, vapor-phase, steam-reforming processes utilizing non-renewable hydrocarbons. In addition, this reforming process occurs at temperatures where the water-gas shift reaction is favorable for low CO concentrations, making it possible to generate PEM fuel cell-grade hydrogen utilizing a single chemical reactor. Furthermore, oxygenated hydrocarbons derived from carbohydrates are nonflammable as well as non-toxic, allowing them to be safe transportable fuels.

Dr. Randy D. Cortright, Co-Founder and Chief Technical Officer, Reactor and Catalyst Design. Virent Co-PI on this Project. Education:

- 1994 Ph.D.University of Wisconsin (Chemical Engineering)
- 1986 M.S.Michigan Technological University (Chemical Engineering)
- 1977 B.S.Michigan Technological University (Chemical Engineering)

Dr. Randy Cortright is a co-founder of Virent Energy Systems with Professor James Dumesic. Dr. Cortright has an extensive background in the energy field, first as a process engineer working with UOP Inc. and then in academia investigating catalytic systems for the clean manufacturing of fuels and petrochemicals. His experience with UOP includes designing, starting-up, and supervising the operating of pilot plants that tested catalysts for oil and petrochemical processing units and traveling as a technical represented and working as a trouble shooter or startup supervisor for over thirty different oil refining or petrochemical units including crude distillation columns, hydrotreaters, naphtha reformers, xylene isomerization units, xylene separation units (Sorbex technology), and fluidized catalytic cracking units. Dr. Cortright earned his PhD in Chemical Engineering under the supervision of Prof. Dumesic at the University of Wisconsin. After receiving his PhD, Dr. Cortright continued to collaborate with Prof. Dumesic and investigated the fundamental chemistry for a number of catalytic processes. He began investigating the catalytic processing of oxygenated compounds derived from renewable carbohydrate sources. These investigations have resulted in applications for three patents including the technologies that Virent Energy Systems will be developing and marketing. Dr. Cortright has 30 technical publications and is a listed inventor on four patents.

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Determining the Maximum Operating Capacity of Transmission Lines using LiDAR Aerial Surveys

Date/Time:	Thursday, November 21, 2002, 11:45 AM - 1:00 PM
Speaker:	Scott J. Piernot, P.E., Vice President, Realtime Design Services, Madison
Location:	Rocky Rococo's Pizza, 7952 Tree Lane (Madison Beltline Hwy. at Mineral Pt. Rd.), 608.829.1444
Menu:	Pizza buffet, salad and soft drinks (cost $10.00, free for student members)
RSVP:	by November 18th to Tom Yager via email (tyager@ieee.org) or call 608.821.0821 ext. 342

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For many utilities, a key issue facing the electric utility industry today is determining the transmission adequacy for maximum operating conditions on existing lines. Today's technology in rapid survey data collection, post-processing and high-tech data analysis makes identifying low-cost solutions and upgrade feasibility a much simpler process than many might anticipate.

Determining limiting clearance conditions based on field-measured conductor tensions and performing “What If” scenarios for elevated operating temperatures, allows planners and engineers to have the information necessary to create effective Cost/Benefit and Incremental Upgrade Strategies that maximize their existing transmission assets.

Realtime Design Services, Inc. has had recent success in this area. Using LiDAR aerial survey technology, data was rapidly collected and processed on more than 1,800 miles of transmission lines. This data was then used to build and analyze line models for their transmission line clients in a fraction of the time required by conventional processes.

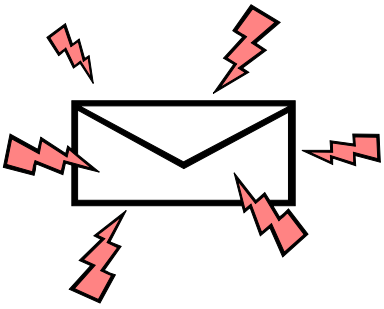
Realtime will summarize:

- The latest in LiDAR aerial survey technology and how it’s used to provide accurate 3-dimensional data within transmission corridors.
- How this data is used to build design study models to find unrealized capacity.
- Using these study models to produce Rating Studies & Elevated Temperature Studies to identify low cost clearance upgrades and provide exact information for engineers & planners to budget for capital investment and incremental upgrades to maximize their transmission assets.

IEEE Madison Section Elections

Although the IEEE Madison Section Officer Elections will not take place until December, it's time for potential candidates to start thinking about running. Candidate nominations are welcome and encouraged for all positions. The positions include chair, vice-chair, secretary, treasurer, and multiple member-at-large positions. Nominations may be made by telephone or via e-mail to the Chair (278-0377, rotter@ieee.org).

Madison Section Mailing List



Some of you may not realize that the IEEE Madison Section has a email mailing list (madison-section). This list is very low volume and is only used for meeting announcements and general announcements that may be important to the membership. Only the list moderator is allowed to post messages so you won't receive any advertising or spam. Instructions on how to subscribe may be found on the IEEE Madison Section web site located at <http://www.bugsoft.com/ieee>. Just look under "Madison Section Mailing List". Basically you just send an email to <majordomo@majordomo.ieee.org> with `subscribe madison-section` in the body of the email (the subject is ignored). The list moderator will receive your request, verify your membership, then add you to the list. You will then receive notification that you have been subscribed to the list. This process may take a few days, so be patient.

Madison IEEE Entrepreneurs' Network

A new Madison IEEE Entrepreneurs' Network Chapter is being formed. For more information contact:

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