

October Section Meeting: Fuel Grade Ethanol Production From Cellulose and Other Sources

Ethanol is an alternative fuel produced from renewable and sustainable resources, and has already proved to be practical, efficient, and affordable. Made by fermenting and then distilling simple sugars from corn, sugarcane, or sorghum, or from cellulosic feedstock like agricultural waste, paper pulp, or switchgrass, ethanol is nothing fancier than 200-proof grain alcohol - the kind of old-fashioned moonshine once cooked up in back-country stills.

The idea of using it to fuel cars is as old as the automobile itself - Henry Ford's Model T was designed to run on ethanol, and Thomas Midgley, the inventor of high-octane leaded gasoline, drove a car powered by an ethanol-gasoline blend to the 1921 meeting of the Society of Automotive Engineers. But despite these sepia-toned origins, ethanol has some very twenty-first century aspirations. By the year 2050, ethanol could reduce American production of global-warming gases by 1.7 billion tons a year, while simultaneously reducing the release of other air pollutants like sulfur, carbon monoxide, and particulates, and move the country significantly closer to energy independence.

At the moment, most of the ethanol produced in the United States starts out as corn. Only the starchy part of the corn kernel is used; the leftover oils, fibers, and proteins are used as animal feed. But most biofuel experts believe that corn ethanol is a transitional technology. In the near future, greater amounts of ethanol will be derived from cellulose -

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October Section Meeting

Topic: Fuel Grade Ethanol Production From Cellulose and Other Sources

Speaker: Steven D. Wagner,
Vice-President of Merrick & Co.,
CEO/President of MMI/Etoh, Inc.
Ownership Entity for the Ethanol
Plants

Date: Tuesday, October 16th

Time: 6:00 – 7:00 Social
7:00 – 8:00 Dinner
8:00 – 9:00 Presentation

Location: Merrick & Co. Headquarters
2450 S. Peoria St, Aurora
(303) 751-0741
Second floor conference room

Menu: Chicken, mashed potatoes and
vegetables catered by Boston Market.

Cost: Members: \$20
(w/RSVP)* Non-Members: \$25
Students & Unemployed: \$10

Please RSVP by **Friday, October 12th** (early RSVPs are greatly appreciated!) indicating your name, phone number, and number of attendees. Please RSVP to Craig Turchi by voicemail at 303-874-8285 or email at rockyaiche@yahoo.com.

*Add \$5 for attending meeting without RSVP

Note: Payment will be requested from no-shows (unless reservation is cancelled by RSVP deadline)

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the tough structural material found in a plant's leaves, stalk, and roots.

Cellulose is the most common organic compound on earth, present in everything from paper pulp to hog manure. Because cellulose is fibrous, it has to be broken down into simpler molecules before it can be fermented, a requirement that has made cellulosic ethanol more difficult to produce. Now, thanks to new technologies like ours that generate no toxic waste and very few greenhouse gases, a growing number of companies believes it makes economic sense to produce fuel from materials that have no future on the dinner plate: wood slash, grasses, corn stover (the stalks and cobs left after processing), sawdust, garbage, and even manure.

The exciting thing about cellulosic ethanol is that the raw materials are all around us. Biomass feedstock is created every time someone prunes a tree, flushes a toilet, or mills a log. Dedicated biomass crops like switchgrass, willow, or poplar trees can be grown expressly for the purpose of providing feedstock for ethanol production. But cellulosic ethanol can also be made from materials that currently clog up landfills: agricultural and timbering leftovers, urban wood wastes, scrap paper, animal manure, sewage sludge, and industrial residue from wood pulping or food processing.

Ethanol's critics have suggested that demand for the fuel could outstrip the agricultural land available to grow the corn to make it. That objection vanishes when cellulosic sources are factored in. The U.S. Department of Energy estimates that the nation's forest and agricultural lands can sustainably produce 1.3 billion tons of biomass each year - biomass which could be converted into 100 billion gallons of ethanol. That's enough to reduce our nation's gasoline consumption by more than half.

Cellulosic ethanol has an extremely favorable net energy balance, which means that it takes very little energy to create it. Feedstocks such as switchgrass, and agricultural and industrial wastes are produced without the need for a lot of fertilizers or other fossil-fuel inputs. Switchgrass, for example, yields four units of energy for every unit of energy used to grow it, and the ratio of energy output to input for waste feedstock may be even higher.



Merrick & Co. Headquarters

Mr. Wagner received his BS degree in Chemical Engineering from Kansas State University and an MBA from Louisiana State University. He has 16 years of service with Merrick and over 30 years of experience in the design and construction of refining, petrochemical, and renewable energy projects. Prior to his tenure with Merrick, Steve was a project manager, project engineer, marketing coordinator and cost/scheduling engineer with Fluor Corp., Houston Division. He is on the board of directors of the Renewable Fuels Association and member of the Cellulosic technical committee for the RFA. Mr. Wagner is currently responsible for project and business development of conventional fuels and renewable energy projects for Merrick & Company.

AIChE ROCKY MOUNTAIN SECTION WEBSITE UPGRADED

The Rocky Mountain AIChE section has recently upgraded our website location to be part of the National AIChE website. Check out our new site at www.aiche.org/rockymtn. Any updates or additions can be sent to Laura Moes at lauramoes@msn.com.

NEW MEXICO CORNER

If you'd like to volunteer to speak at a future meeting or if you have any meeting/activity ideas, please let me know! Participation in the Albuquerque area has increased over the last year and I'd like to keep this trend going! Again, a warm "Thank You" to all of the AIChE-NM members for making our little sub-section a great one! See you soon!

Kerrie Greenfelder, New Mexico Liaison
GreenfelderKL@cdm.com

EMPLOYMENT - Positions Available

*Send **Position Available** notices to lauramoes@msn.com. \$25/month per listing.
Listing will also be placed on web page (aiche-rm.org).*

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AIChE Meetings

2007

Nov 4-9 2007 Annual Mtng.
Salt Lake City, UT

2008

Jan 20-23 SBE Int'l Conf. On
Stem Cell Eng.
Coronado, CA

Apr 6-10 Spring Nat'l Conf.
New Orleans, LA

June 22-25 2008 Process
Development
Symposium
Hancock, MA

Sept 7-11 2008 Ammonia
Symposium
San Antonio, TX

Nov 16-21 AIChE Annual Mtg.
Philadelphia, PA

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National AIChE.

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The objectives of AIChE are to advance chemical engineering in theory and practice, to maintain a high professional standard among its members, and to serve society, particularly where chemical, engineering can contribute to the public interest.

Rocky Mountain AIChE News Publication Schedule

November 2007 issue

Articles due Wednesday, November 7th

Publish on Friday, November 9th

Meeting on Tuesday, November 20th

MEETING SCHEDULE

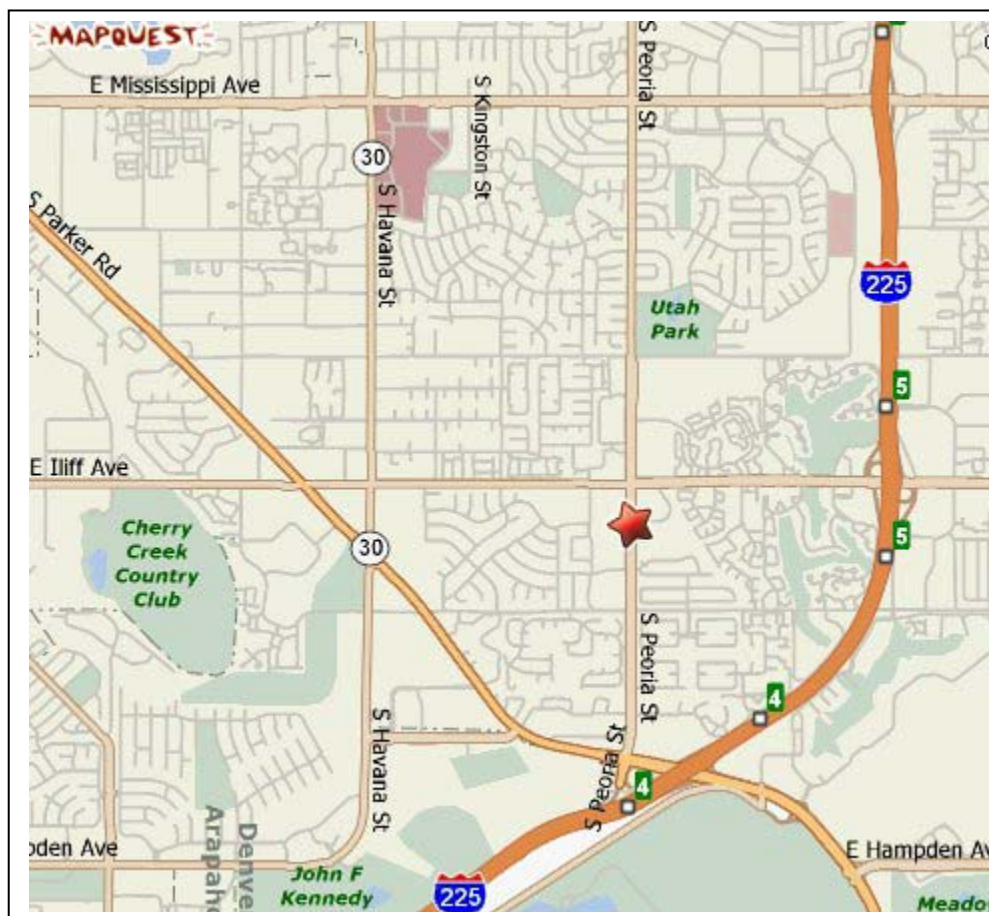
The Rocky Mountain District of AIChE generally meets the third Tuesday of every month, September through November and January through May.

Rocky Mountain AIChE News
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On the Web at:

<http://www.aiche-rm.org>

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mmoes@ekiconsult.com to receive
this newsletter electronically!*



Directions: From downtown Denver, drive south on I-25. Exit east on East Evans Ave. (#204) which will turn into East Iliff Ave. Turn right onto South Peoria Street and look for Merrick on the left hand side. Parking available in front of the building.

Driving directions on website:
<http://www.merrick.com/locations/colorado/aurora.aspx>