
FUEL CHEMISTRY NEWS

Newsletter of the ACS Division of Fuel Chemistry

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Fall 2010

Dear Fellow Members:



So far, 2010 has been an eventful year! I felt the meeting in San Francisco went very well and that all enjoyed the meeting. As most of you know by now, we are in an exploratory phase to determine merging with the Petroleum Division. You should have received an email from Dave King regarding membership support of exploring the merger (see further explanation in following paragraph). Andy Herring (Colorado School of Mines) is now our Program Secretary and Chang-jun Liu is the 2010 Program Chair; we had a very successful meeting in San Francisco – we are all looking forward to Boston in August 2010.

A committee has been formed to explore the merger of the Fuel Chemistry and the Petroleum Chemistry Divisions. The committee is composed of equal members from each division and include: Petroleum Division – Dady Dadybujor, Joe Allison, Lisa Nash Houston, Ted Oyama, Kristi Fjare, and Marty Gorbaty/Fuel Chemistry Division – Caroline Burgess Clifford, Andy Herring, Katie Carrado Gregar, Chunshan Song, Charles Taylor, and Harold Schobert. The committee met at the San Francisco National meeting. In May 2010, the

committee had a teleconference to outline the action items to move forward. The first action was to get approval of each executive committee to go forward with exploring the merger – each division executive committee supports exploration of the merger. The second action item was to send a letter to the membership regarding support for the exploration of the merger – Fuel members should have received the letter by email and can voice support and comments at www.acs.org/mergepoll by August 1, 2010. The committee also submitted an Innovation Grant to ACS for funds to explore the merger. Several subcommittees have been formed in order to determine issues related to programming, budgeting, preprints, awards, and by-laws. If you have any interest in participating on the merger committee, please contact anyone on the committee.

Several awards were presented at the joint Fuel/Petroleum Dinner at San Francisco at the Le Colonial. The 2009 Spring Glenn Award was presented; the winning paper was “Nonpolar speciation of Athabasca bitumen by atmospheric pressure photoionization FT-ICR mass spectrometry” authored by Amy McKenna, Jeremiah Purcell, Parviz Rahimi, Ryan Rodgers, and Alan Marshall. The paper was presented March 22, 2009 in the symposium “Alternative hydrocarbons: Tar sands, oil shale, and heavy oil: Production, processing, and chemistry.” It was also announced that Dr. Chunshan Song was selected as the 2010 Henry H. Storch Award winner and will

hold the Storch symposium and be presented the award at the Fall 2010 meeting.

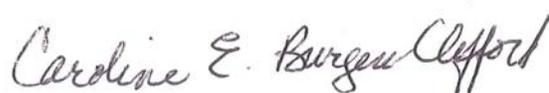
Membership remains high in the Fuel Chemistry Division; as of Spring 2010, we had 1312 members. We remain highly international, with 49 countries being represented. Approximately 24% of our members are international or US members living abroad, with significant contributions from Japan, Canada, United Kingdom, South Korea, China, Australia, and Spain. We have 327 members in common with the Petroleum Division, 162 with IEC Division, and 106 with Environmental Division. One of the issues brought up at the last executive council is only 12% of our membership is female, so we will be working on ways to increase our female membership this year. Our past chair, Charles Taylor, received \$7,000 for an Innovation Grant titled "Sponsorship for graduate students for participation on Executive Board." Two students were selected to attend the meeting (and participate in the executive council meeting) in San Francisco: Meredith Bembenic and Yesica Alvarez, both Penn State graduate students. The executive committee approved adding a poster student session for the Fall 2010 meeting, called Chemistry for Energy; participating students will be eligible for an award.

The Fuel Chemistry Division is still strong, both in membership and the treasury. A survey last year indicated that about ½ the members wanted to keep preprints and the other ½ did not want to publish preprints. The executive committee decided to provide preprints on-line rather than sending out CD-ROMs, which should save funds. To learn more, I encourage Fuel Division members to attend the business meeting and the joint Fuel/Petroleum dinner.

New Executive Council members include: Andy Herring (Chair-elect 2010), Yongsheng Chen (Treasurer), Semih Eser (Councilor), Angela Lueking (Alternate Councilor), and Hong Cui (Preprint Director). We are pleased that these people are willing to serve the division. The following have been nominated for elections this year: Chair Elect for 2011: Jonathan Mathews and Parviz Rahimi; Secretary: Michelle Kidder; and Director-at-Large: Phil Britt and Chunshan Song. You'll be receiving your ballot soon.

I look forward to seeing many of you in Boston!

Caroline E. Burgess Clifford, Chair, 2010, Fuel Chemistry Division, ACS



Awards:

Harold Schobert has been elected a Fellow of the American Chemical Society in the 2010 class of Fellows. Harold is a Professor of Fuel Science at Penn State University and also is Extraordinary Professor of Natural Sciences at North-West University in South Africa. Harold has been active in coal research for about 35 years, mainly in conversion of coal to clean liquid and gaseous products and to value-added carbon materials. He received the Storch Award in 2004 and the division's Distinguished Service Award in 2009. Harold has served the division as Chair, Councilor, Director, chair of the trustees, and as a member of the strategic planning, awards, and merger committees.

Chunshan Song Selected as Winner for 2010 Henry H. Storch Award in Fuel Chemistry from ACS



Chunshan Song, distinguished professor of fuel science in the Department of Energy and Mineral Engineering and Director of EMS Energy Institute at Pennsylvania State University, was selected to receive the Henry H. Storch Award in Fuel Chemistry at the American Chemical Society (ACS) Spring 2010 national meeting held in March 2010. He received this prestigious award in recognition of his outstanding contributions to fuel science especially in the areas of clean fuels, catalysis, and CO₂ capture and conversion research.

The Henry H. Storch Award, co-sponsored by the Division of Fuel Chemistry of the ACS and Elsevier Ltd., is given annually to recognize an individual in the field of fuel science for an exceptional contribution to research on the chemistry and utilization of hydrocarbon fuels. Special consideration is given to innovation and novelty in the use of fuels, characterization of fuels, and advances in fuel chemistry that benefit the public welfare or the environment. The award is the highest honor for

research awarded by the ACS Fuel Chemistry Division.

Song was recently named a Distinguished Professor of Fuel Science by Penn State's Office of the President. He is also professor of chemical engineering and Associate Director of the Penn State Institutes of Energy and the Environment. He received a BS in chemical engineering in 1982 from Dalian University of Technology, China, and a MS in 1986 and PhD in 1989 in applied chemistry from Osaka University, Japan. He worked at the Research Center of Osaka Gas Company in Japan prior to joining Penn State in November 1989.

Song is internationally recognized for his original and innovative contributions to clean fuels, catalysis and CO₂ capture and conversion research. His early research at Penn State on catalytic coal liquefaction and the effects of drying on coal conversion at low temperatures led to a new method for preparing highly active dispersed catalysts using a water and sulfide precursor. Based on this discovery, further fundamental studies using probe molecules resulted in two patents licensed to industry for inventions related to nanosized ultra-high-surface metal sulfide catalysts. From his efforts to make better use of coal-derived aromatics for value-added chemicals, he designed shape-selective alkylation catalysts for synthesis of precursors for advanced polymers and engineering materials from naphthalene, which have also been patented and licensed to industry. He has made major contributions to the development of coal-based advanced thermally stable jet fuels through his work on fundamental chemistry concerning the effects of intrinsic fuel composition and structure on thermal degradation of jet fuels, and his work on model compounds studies related to stable bicyclic structures and hydroaromatics and their tailored production through catalysis. These developments were part of the large, 20 year, U.S. government-funded jet fuel project led by Harold Schobert at Penn State, which has been scaled up to pilot plant production. For ultraclean fuels and fuel cells, Song and his group devised an innovative approach to selective adsorption for removing sulfur from liquid hydrocarbon fuels over solid surface without using hydrogen. This approach has been licensed to industry as well and is already used for making prototype systems. Song's group recently developed a novel approach to CO₂ capture by "molecular-basket sorbents" consisting of nanoporous matrix and functional polymers with superior capacity and selectivity. In addition, his group developed sulfur-tolerant and carbon-resistant bimetallic and trimetallic catalysts for lowtemperature steam reforming of liquid fuels and non-pyrophoric catalysts for oxygen-assisted water gas shift. He recently proposed a new design concept of sulfur-tolerant noble metal catalysts for lowtemperature hydrotreating and dearomatization for ultra clean fuels.

Song is an active leader in hydrocarbon processing research and has been elected as Chair of the Fuel Chemistry and the Petroleum Chemistry Divisions of American Chemical Society as well as Chair of the Advisory Board for the International Pittsburgh Coal Conference. He has also served as chair or co-chair for over 35 international symposia, and is currently on eight research journal advisory boards, including *Energy & Fuels*, *Catalysis Today*, *Applied Catalysis B: Environmental*, *RSC Catalysis series*, *Research on Chemical Intermediates*, *Journal of Fuel Chemistry and Technology*, *Acta Petrolei Sinica*, and *Coal Conversion*. In addition, he serves on the scientific advisory boards for several international conference series and for several R&D organizations worldwide.

A prolific author of many high-impact publications, Song has delivered 40 plenary or keynote lectures at international conferences and 190 invited lectures worldwide. He has 170 refereed journal articles (which received over 4000 citations), 6 refereed books, 25 book chapters, 11 special journal issues, 20 patents and patent applications, and over 280 conference papers. He has also received a number of major awards, including the Fulbright Distinguished Scholar from US-UK; the Herman Pines Award for Outstanding Research in Catalysis from Catalysis Club of Chicago in North American Catalysis Society; the Chang Jiang Scholar from the Ministry of Education of China; Most Cited Authors in Catalysis from Elsevier; Outstanding Scholar Overseas from the Chinese Academy of Sciences; the Distinguished Catalysis Researcher Lectureship from Pacific Northwest National Laboratory; the Robinson Distinguished Lectureship from University of Alberta, Canada; the NEDO Fellowship and AIST Fellowship Awards from Japan; and Distinguished Service Awards from the American Chemical Society's Petroleum Chemistry Division, and from the Annual International Pittsburgh Coal Conference. Within the Pennsylvania State University, he has received the Wilson Award for Excellence in Research, the Faculty Mentoring Award, Inventor Incentive Awards and the Materials Science & Engineering Service Award. In addition, Song has held visiting professorships with Imperial College London, University of Paris VI, Tsinghua University, Dalian University of Technology, Taiyuan University of Technology, Tianjin University, and Dalian Institute of Chemical Physics as well as Institute of Coal Chemistry within Chinese Academy of Sciences.

A Storch Award Symposium in Honor of Chunshan Song will be held at ACS Fall 2010 National Meeting in Boston during August 22-26, 2010.

Glenn Award Winners, recognizes outstanding papers presented in the FUEL symposium.



Caroline Burgess Clifford (presenting award); “Nonpolar speciation of Athabasca bitumen by atmospheric pressure photoionization FT-ICR mass spectrometry” authored by Amy McKenna, Jeremiah Purcell, Parviz Rahimi, Ryan Rodgers, and Alan Marshall.

was "Plastic solar cells: the vision of Sukant Tripathy has become reality."



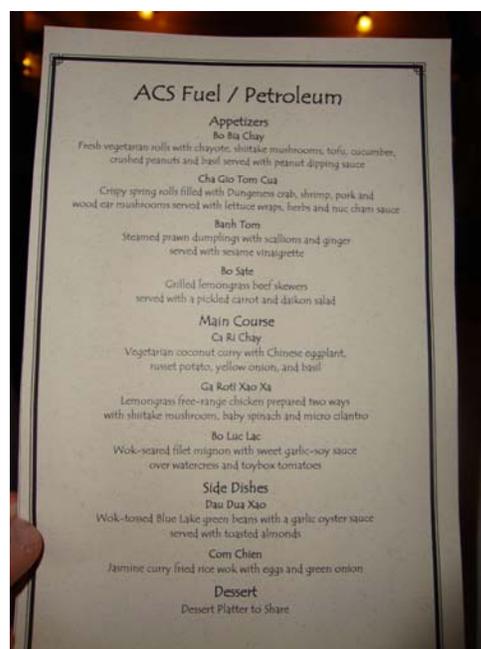
Prof. Tongxiang Fan (above), Di Zhang, Ph.D. and Han Zhou, Ph.D from Shanghai Jiaotong University presented “Artificial inorganic leaves inspired by natural photosynthesis” in the San Francisco Fuel Symposium on CO₂ Capture, Conversion and Utilization. This was an ACS press release March 25, 2010.

Events from the ACS 239th in San Francisco



Pictured above, the ACS Spring 2010 meeting in San Francisco. The Fuel Symposium on Solar Cell and Solar Fuels attracted many high profile speakers including Prof. Alan J. Heeger, the Nobel Prize Laureate. His presentation topic

Fuel Dinner





Executive Committee Dinner



Fuel Preprints are now online at:
<http://pubs.acs.org/meetingpreprints/>

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241st ACS National Meeting & Exposition. March 27-31, 2011, Anaheim, California

ACS Theme: Chemistry of Natural Resources: Feeding a Hungry World

Spring 2011 Fuel Division Program

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Symposia Topics:

1 Fuels, Chemicals, Materials and Energy from Coal, Biomass, Natural gas, Coal-Bed Methane and other Natural Resources

Organizer:

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2 Gas Hydrates, Clathrates and Alternative Energy Sources: Production and Processing Chemistry

Organizers:

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Prof. E. Dendy Sloan, Center for Hydrate Research, Department of Chemical Engineering, Colorado School of Mines, Golden, CO 80401-1887; esloan@mines.edu

3 Role of Catalysis in Fuel Cells

Organizers:

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Prof. Dr.Umit Ozkan, Department of Chemical and Biomolecular Engineering, Ohio State University, Columbus, OH 43210, USA. E-Mail: ozkan.1@osu.edu

4 **Solar Energy Conversion and Utilization for Fuels and Energy Production**

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5 **CO₂ Capture, Sequestration, Conversion and Utilization**

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Anne Gafney

6 **Ultraclean Fuels Production and Utilization for Sustainable Transportation**

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7 **Nanomaterials and Nanotechnology in Fuels and Energy Production**

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Prof. J. Iwan D. Alexander, Cady Staly Professor of Mechanical and Aerospace Engineering Director, The Great Lakes Energy Institute, Case Western Reserve University, Phone:(216)-368-6045
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8 **Spectroscopic Techniques to Elucidate Reaction Mechanisms and Structure-Activity Relationships in Fuel Science**

Organizers:

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Dr. Sivakumar Vasireddy, Gordon A and Mary Cain Department of Chemical Engineering, Louisiana State University, Baton Rouge 70803, LA, USA, E-mail: svasir1@lsu.edu; Phone: 225-578-1922.

9 **Advances in Analytical Characterization of Hydrocarbon Resources**

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10 Advances in Fuel and Energy Technologies (Poster)

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Lead by PETR Division

Heavy oils, Resids and Bitumen: Upgrading Chemistry and Process

Organizers: Give it PETR with co-sponsorship

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