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Catalysis Club of Philadelphia

Thursday, January 19th, 2017

DoubleTree Hotel

4727 Concord Pike Wilmington, DE 19803

F. G. Ciapetta Lectureship Awardee: Ahmad Moini Novel Zeolite Catalysts for Diesel Emission Applications

BASF Corporation, Iselin, NJ

Student Speaker: Tzia Ming Onn

Preparation of Pd-based thin film LaFeO₃ by Atomic Layer

Deposition onto Al₂O₃ support

University of Pennsylvania

Social Hour: 5:30 PM

Dinner: 6:30 PM

Meeting: 7:30 PM

Members: \$35.00

Walk Ins & Non-members: \$40.00

Students & Retired Members: \$20.00

Menu (served as a buffet)*

Braised Chicken Quarter – plum tomatoes, cilantro, green chiles, chimichurri rice and roasted baby zucchini

Mushroom Stuffed Flank Steak – local Kennett Square mushroom medley roasted with goat cheese and herbs, rosemary whipped potatoes, sautéed green beans, and a sherry reduction

Grilled Vegetable Ravioli – grilled vegetables blended with ricotta, mozzarella, parmesan, fontina & pecorino romano cheeses wrapped in basil pasta

**Served with a classic Caesar salad, rolls and butter, chef's choice of desserts, coffee, tea, iced tea, decaf, and water.*

Meal reservations – Please register online by **Friday, January 13th** at <http://catalysisclubphilly.org/program/meeting-registration/> or notify your company representative or our Arrangements Chair Tzia Ming (tonn@seas.upenn.edu)

Membership - Dues for the 2016-17 season will be \$25.00 (\$5.00 for the local chapter and \$20.00 for the national club). Dues for students, post-docs and retirees will be \$10.00 (\$5.00 for local club and \$5.00 for national club).

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Novel Zeolite Catalysts for Diesel Emission Applications



F. G. Ciapetta Lectureship Awardee: Ahmad Moini

BASF Corporation, Iselin, NJ, USA

Abstract: Automotive exhaust conditions present unique challenges for the design of effective catalysts. In addition to the need for catalytic activity over a wide temperature range, the catalyst must show durability towards extreme hydrothermal aging conditions. The use of zeolitic materials under such conditions is especially challenging due to the vulnerability of zeolites to steam aging. The BASF discovery of the Cu-CHA catalyst for selective catalytic reduction (SCR) of NO_x demonstrated an effective balance between favorable active sites and zeolite framework durability. It also paved the way for the implementation of urea SCR as the key approach for NO_x reduction in diesel vehicles. This presentation will highlight the development of Cu-CHA as the leading technology for diesel emission applications. Specific focus will be placed on the synthesis and structural features of the zeolite. In addition, there will be a discussion of specific characterization and modeling approaches focusing on the unique attributes of the metal active sites and the interaction of these metal species with the zeolite framework.

Biography: Dr. Ahmad Moini is a Research Fellow at BASF Corporation in Iselin, NJ. He obtained his Ph.D. in Chemistry from Texas A&M University, and held a postdoctoral appointment at Michigan State University. Dr. Moini started his career at Mobil Research & Development Corporation (now ExxonMobil), where he conducted research on microporous materials. With a focus on exploratory zeolite synthesis, he studied the mechanism of zeolite crystallization and the role of specific classes of organic directing agents in the formation of various zeolite frameworks. He joined Engelhard Corporation (now BASF) in 1996. Since then, his primary research interests have been in the area of materials synthesis, directed at a range of catalytic and functional applications. He applied high throughput methods for the synthesis and evaluation of catalytic materials, and used these tools for the development of new products. A significant part of his work has been directed towards catalysts for environmental applications. These efforts, in collaboration with the extended BASF team, led to the discovery and development of Cu-CHA catalyst for selective catalytic reduction (SCR) of NO_x from diesel vehicles. He holds 48 US patents relating to various aspects of materials and catalyst development.

Student Speaker

Preparation of Pd-based thin film LaFeO_3 by Atomic Layer Deposition onto Al_2O_3 support



Tzia Ming Onn

University of Pennsylvania Doctoral Student, working with Prof. Raymond J. Gorte

Sintering of supported-metal catalysts is a serious problem for high-temperature processes, such as in the case of $\text{Pd}/\text{Al}_2\text{O}_3$ catalysts used for methane oxidation. In an attempt to stabilize a $\text{Pd}/\text{Al}_2\text{O}_3$ catalyst, the present work investigated the use of Atomic Layer Deposition (ALD) to prepare thin films of LaFeO_3 onto high surface area Al_2O_3 support. Pd was then added onto these perovskite films to demonstrate the concept of “intelligent catalysts” which allows for redispersion of metal particles. Gravimetric analysis, BET surface area measurement, and various elemental analysis were used to establish the formation of the thin film. Metal dispersion measurements were used to characterize the ingress and egress of the Pd particles after a cyclic sequence of oxidation and reduction.

