

SPONSORS

Catalysis Club of Philadelphia

Thursday, September 20, 2007

Holiday Inn Select Hotel

Naamans Road and I-95, Claymont, DE

Mechanistic Studies of Hydrogen Production from Methanol on PdZn Alloy Catalysts

Professor John M. Vohs

Department of Chemical and Biomolecular Engineering

University of Pennsylvania

Philadelphia, PA 19104-6393 USA

Welcome to the 59th Season of the Catalysis Club of Philadelphia

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Lyondell Chemical

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Social Hour: 5:30 PM

Dinner: 6:30 PM

Meeting: 7:30 PM

Members: \$30.00

Walk Ins & Non-members: \$35.00

Student & Retired Members:
\$15.00

Menu

Chicken Francaise: Egg Battered in
Light Buerre Blanc

Broiled Flounder: Topped with Rock
Shrimp in a Light Lobster Sauce

Portabella Pasta: Grilled Portabella
Mushroom with Penne pasta tossed
in a Spinach Cream Sauce

Meal reservations - Please notify your company representative or Carl Menning (menning@udel.edu, phone: 302-893-9398, fax: 302-831-1048) by **Thursday, September 13.**

Company Representatives – We would like to encourage you to make meal/meeting reservations to your company representative.

Membership - Dues for the 2007-08 season will be \$10.00 (\$5.00 for the local chapter and \$5.00 for the national club). Dues for students and post-docs will be \$6.00 (\$5.00 for local club and \$1.00 for national club). Please send your payment to Steve Harris, Lyondell Chemical Co., 3801 West Chester Pike, Newtown Square, PA 19073-2387.



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Abstract

Methanol and other alcohols are potential bio-renewable sources of hydrogen. The use of alcohols, however, as a H₂ source or storage medium requires stable reforming catalysts that have high activity and selectivity at low temperatures. One such catalyst that has received much attention for steam reforming of CH₃OH (SRM) [CH₃OH + H₂O → CO₂ + 3H₂] is Pd supported on ZnO. Pd/ZnO catalysts have unusually high selectivity (>95%) for the production of CO₂ and H₂ from methanol, in spite of the fact that bulk Pd exhibits nearly 100% selectivity for the dehydrogenation of CH₃OH to CO and H₂ under typical SRM conditions. We are currently trying to understand how the interactions between Pd and Zn have such a profound influence on reactivity and to hopefully learn how to exploit these interactions to design improved catalysts. In this talk I will give an overview of our research program in which we are using model single crystal catalysts to study structure activity relationships for the Pd/ZnO system. Results from our collaborations with other groups that allow us to relate the insights obtained from the model systems to high surface area catalysts will also be presented.