



Inorganic Chemistry Seminar Series

Tuesday, November 7, 2017, 12:30 pm

Seaver Science Library, Room 150

SSC Auditorium next to the library

Professor Brian Trewyn

Department of Chemistry

Colorado School of Mines

Exploring Energy, Environmental, and Biological Challenges with Mesoporous Nanoparticle Technology

Abstract:

Since the discovery of mesoporous materials in late 20th century and advances in synthetic methods for microporous materials, many important applications have been developed and reported in heterogeneous catalysis and fuel cell technology. Incorporating high surface area porous silica and carbon as catalyst supports have led to new developments in controlling reactions by tuning the pore environment for both single-site and multi-site catalysts.

Mesoporous silica materials are multi-functionalized to deliver active, non-native enzymes to both mammalian cells and plant cells through endocytosis and biolistic methods. The unique properties of these mesoporous materials allow for modification of both the internal pore surface and external surface independently for utilization in the separation and sequestration of high-value bio-produced molecules and rare earth elements.

The unique pore structure of mesoporous materials and our ability to functionalize has allowed us to tether homogeneous organometallic catalysts on the confined pore surface to tune the catalytic properties. Non-silica mesoporous materials have unique properties and can be covalently modified to support organic ligands and molecular catalysts. We have recently demonstrated an ordered mesoporous carbon tethered organometallic catalytic technology that oxidizes methane in a direct methane fuel cell system producing current at low temperatures.

Hosted by Professor Richard Brutchey

The scientific community is invited

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