# 学术报告

题 目: Metal-Organic Framework Coated Nanoparticles: A New Way to Control Heterogeneous Catalysis

报告人: Prof. Chia-Kuang Frank Tsung
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时 间: 12 月 23 日（周二）上午 10: 30

地 点: 卢嘉锡楼报告厅（202）

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12 月 16 日

# Metal-Organic Framework Coated Nanoparticles: A New Way to Control Heterogeneous Catalysis

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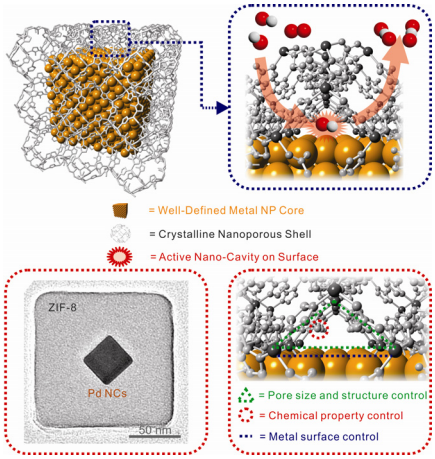
## Abstract:

Heterogeneous catalysis is critical for the prosperity of human civilization. It provides access to the range of chemicals, materials, and fuels we use. Understanding and controlling catalytic processes are essential for developing improved energy storage and conversion technologies. Towards the long-term vision of precisely controlling active sites, our group has developed methods to coat nanoparticle catalysts with crystalline nanoporous materials, metal-organic-framework (MOF) and inorganic zeolite-based shells. The precise molecularly-defined pores intrinsic to the MOFs and zeolites provide a new mechanism to control the interaction between reactants undergoing catalytic transformations on the surface of the nanoparticles. We combine composition and facet controlled nanoparticles with precisely tuned pore structures to manipulate the diffusion, sorption, orientation, and conformation of the reactant molecules during the reaction. Our initial catalysis data demonstrate the new core-shell catalysts exhibit molecule-size-selective reactivity.

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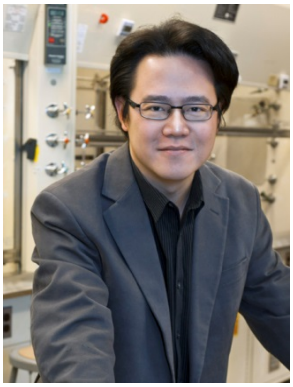

Prof. Chia-Kuang Frank Tsung received his undergraduate training at National Sun-Yet Sun University in Taiwan, where he received his B. S. degree. He then moved on to UC Santa Barbara, where he pursued a doctoral degree in the laboratory of Galen D. Stucky. As a graduate student, he carried out research at the forefront of materials chemistry, focusing on the synthesis and characterization of metal and metal oxide nanostructures. After his productive graduate studies, Prof. Tsung moved to UC Berkeley, where he became a postdoctoral fellow with Gabor Somorjai and Peidong Yang. Frank's postdoctoral work centered on the development of high performance heterogeneous catalysts. Prof. Tsung joined the chemistry faculty at Boston College in the summer of 2010 and has established a compelling research program. Prof. Tsung is interested in identifying new approaches to change the behavior of heterogeneous catalysis in a fundamental way. His research strategy is based on the molecular-level control of the catalytic transformation through tuning of molecule adsorption on active metal surfaces.