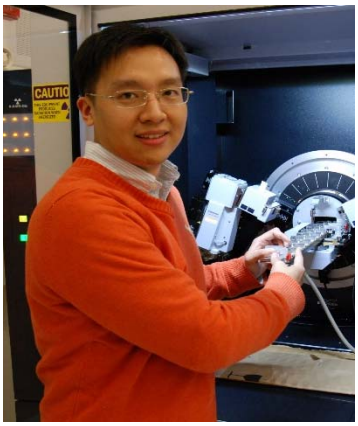
UCLA Chemistry & Biochemistry

INORGANIC CHEMISTRY SEMINAR



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Molecularly Defined Interface

Abstract: The science and technology of energy, environment and human health, involves the use of materials where reactions take place at the interface. This is exemplified in the conversion of carbon dioxide to useful chemicals and fuels, controlling ions' movement in a battery, or uptake and release of large biomolecules, all rely on the use of interfaces in materials and devices. Such interfaces, although critically important to achieving the desired property and optimization of such property, are known to be most challenging to probe and study because of the heterogeneity in their composition. Here, we propose a new concept, termed "Molecularly Defined Interfaces" that combines emerging chemical and physical techniques for the customized design and control of interfaces with accurate molecular environment. A typical example is using metal-organic frameworks to encapsulate catalyst particles. MOFs are known to have crystalline and porous structures that favor the diffusion of substrates to catalytic sites, while the molecularly-defined environment endowed by multiple choices of metals and functional groups provides an extra handle at controlling the chemistry at the interface. These new constructs created via "Molecularly Defined Interfaces" concept have already demonstrated tremendous potential that exceed traditional catalysts in both specificity and selectivity. The ability to control the composition, porosity, functionality, metrics, and spatial arrangement of molecular building blocks leads to the creation of next generation interfaces whose function, for the first time, is parallel to that of enzymes. More importantly, these molecularly defined constructs are far more resilient and stable under a wide range of conditions.

Friday, October 26th, 2018
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1:30 p.m.

Please contact Monica Sandoval Perez (monica@chem.ucla.edu) for additional information.
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