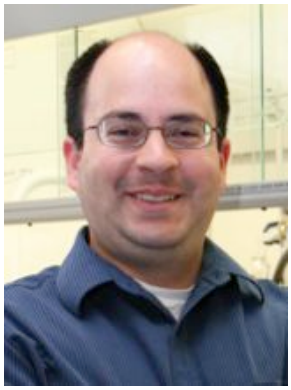
INORGANIC CHEMISTRY SEMINAR

Molecular Control of Nanoscale Composition, Morphology and Function: From Compositionally Graded Nanorods to Photochemical Alcohol Dehydrogenation



by **Professor Javier Vela**
Department of Chemistry
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Wednesday, April 24, 2013
Cram Conference Room, 3440 Mol Sci
4:30 pm

Refreshments will be served

Abstract

The focus of our research program is the design of new powerful and universal synthetic strategies that span the continuum between molecular and nano scales, and that enable effective processing and incorporation of nanomaterials into innovative optical, catalytic, and energy conversion technologies. Semiconductor-metal "hybrid" heterostructures are materials capable of harvesting solar energy, converting it to potential energy via charge-separation, and subsequently to chemical energy. Our group has found highly reproducible routes for making axially graded CdS1-xSex nanorods and their metal hybrids. We have achieved molecular-level control of semiconductor nanorod composition and morphology, as well as photochemical control over site-selective deposition of surface-bound metal particles. Synthetic conditions are shown to play a critical role in controlling relative spatial configuration between a heterostructure's components. Tuning spatial composition will allow engineering and directing energy flows at the nanoscale. The resulting visible-active semiconductor-metal hybrids are active photocatalysts for sunlight-driven conversion of biomass-relevant substrates into value-added chemicals and fuels.

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