

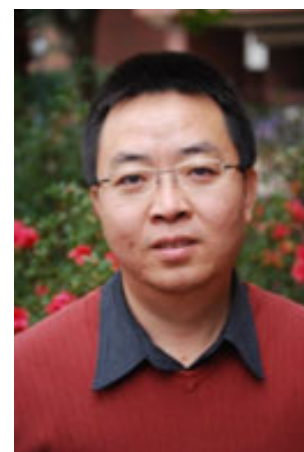
THURSDAY, MAY 8, 2014
12:15 PM, 1315 CHEMISTRY

Analytical & Materials Seminar

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“ Plasmon-mediated Surface Chemistry for Solar Photocatalysis ”

Using sunlight to facilitate and promote valuable chemical reactions is an ideal solution to the challenge of meeting future energy demands. Our group aims to address fundamental questions concerning surface plasmon resonance (SPR)-mediated interfacial electron transfer (ET) and photothermal heating in order to develop new materials and strategies for efficiently converting solar energy to chemical energy. In this talk, I will show how we unambiguously reveal the mechanics of plasmon-mediated electron transfer (PMET) in Au/TiO₂ heterostructures under visible light ($\lambda > 515$ nm) during in situ operation. I will further discuss how we directly probe the relaxation dynamics and energetics of the transferred “effective hot electrons” that participate in photocatalytic reactions. I will explore some strategies for manipulating “hot electrons” for the rational design and construction of a new class of multi-component solar photocatalysts for efficiently producing H₂ from water. Finally, I will touch on our recent effort to use SPR-mediated photothermal effects to synthesize hybrid bimetallic nanomaterials and then use these nanomaterials to oxidize CO in the presence of visible light.

