

A decorative banner at the top of the page features a molecular model with various colored spheres (red, yellow, blue, black) representing atoms, connected by lines representing bonds. The spheres are arranged in a complex, three-dimensional structure.

Inorganic Chemistry Seminar Series

12:30 pm, Tuesday, April 12, 2022

Seminar Link: <https://usc.zoom.us/j/91522686061>

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Switchable Optical Materials from Metal Oxide Nanocrystals

Dynamic control over light has myriad applications from telecommunications to chemical sensing and therapeutics. Modulating interaction of materials with infrared light is useful for energy applications, like smart windows and active cooling, applications that require materials at scale. I will discuss two distinct strategies for modulating visible and infrared light with materials crafted from colloidal metal oxide nanocrystals. One approach involves reversible structural reorganization of gel networks, where plasmonic coupling in the assemblies strongly modifies the infrared absorption. Here, the building blocks are tin-doped indium oxide (ITO) nanocrystals with synthetically tunable plasmonic absorption spectra. A second approach involves reversible electrochemical charging of transition metal oxide nanocrystals (tungsten and niobium oxides). Charging results in strong absorption of either visible or infrared light depending on the electronic state resulting from ion intercalation. Overall, metal oxide nanocrystals offer compelling opportunities as building blocks for dynamic and tunable optical and electronic materials.

Hosted by Professor Richard Brutchey

The scientific community is invited

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