

*Dopant atoms in “crystalline” solids:
Understanding the influences of local compositions
and structures on the properties of solid-state
phosphors and heterogeneous catalysts*

Advances in synthesis, characterization, and modeling capabilities enable the features of heterogeneous semi-crystalline solids to be measured, understood, and correlated with their macroscopic physicochemical properties. This includes solid-state phosphors and heterogeneous catalysts, such as rare-earth-doped oxides, and aluminosilicate zeolites, whose complicated compositional and structural order and disorder have important influences on their macroscale behaviors. By using a combination of scattering, bulk property, and solid-state NMR spectroscopy analyses, such materials can be probed over multiple length scales to obtain and correlate insights on local bonding environments, interactions, and distributions of functional moieties with their macroscopic material properties. Recent results will be presented on the influences of order and disorder on the photoluminescence or chemical reactivities of non-stoichiometric oxides, which can be used to guide their rational design for solid-state lighting or catalytic applications.

Thursday, January 18
12:15 pm in room 1315 Chemistry



Materials Seminar

presented by

Prof. Brad Chmelka

University of California, Santa Barbara
Dept. of Chemical Engineering