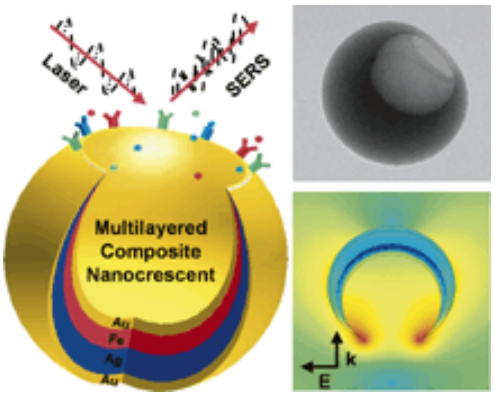
Chemistry 696 (Spring 2011): Supramolecular and Nanostructured Materials



Instructor: Alexander Wei (alexwei@purdue.edu)

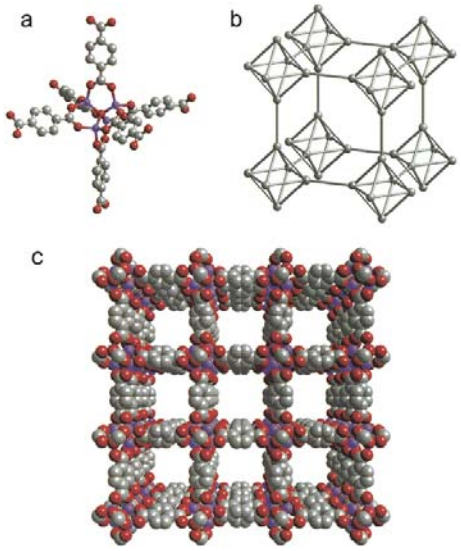
Lecture time: (initially) MWF 8:30-9:20

Note: option for early evening lectures, based on class enrollment

This Special Topics course introduces a structure-based approach to supramolecular and nanoscale materials, with rational control over properties and functions. Intermolecular forces (hydrogen bonding, ion-dipole interactions, and metal-ligand bonding), and longer-range forces will be discussed, and provide the foundation for creating supramolecular or nanoscale architectures with multifunctional or collective properties not found in the individual components. Recent innovations in the design and application of supramolecular and nanoscale materials will be surveyed.

Topics include:

- molecular recognition: ionic and molecular receptors
- supramolecular surface chemistry: surface engineering
- supramolecular solid-state chemistry: crystal engineering and nanoporous solids
- functional nanomaterials: optical and magnetic properties
- molecular and nanoscale devices: electron and energy transport.



Prerequisites: Some familiarity with organic chemistry and thermodynamics (topical reviews on materials will be provided)

Reading: References to the scientific literature (to be assigned in class)

Grading: Quizzes (based on reading assignments), oral presentation, and original proposal. These will be peer reviewed by other members of the class, in a NIH-style review panel.