T_CSUH Bi-Weekly Seminar

Texas Center for Superconductivity at the University of Houston

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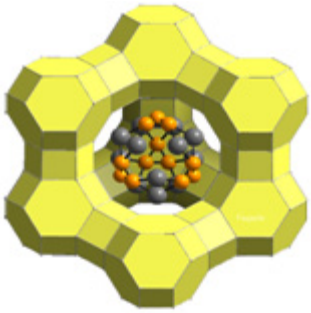
X-ray Scattering Studies of Semiconductor Nanoclusters in Zeolites

Friday, Feburary 29, 2008
Room 102, University of Houston Science Center
12:00 noon – 1:00 p.m.

Abstract

When electrons and holes in a semiconductor are confined to ultra-small regions of space (typically 1-25 nm), the optical and electronic properties of the semiconductor become strongly size-dependent. Such structures are called quantum dots, nanowires or nanoclusters, depending upon their shape and dimensionality. These nanostructures are of great interest for a variety of potential electronic, photochemical and nonlinear optical applications and are necessary for an analysis of the transition from molecular to bulk semiconductor properties.



HgSe semiconductor nanoclusters in Faujasite cages. (001) view

This talk will discuss the structure of HgSe and Se semiconductor nanoclusters synthesized in both Nd-Y (spherical pore) and LTL (tubular pore) zeolites. The molecular structures of these systems were modeled by performing the Rietveld refinement on X-ray Bragg data. A remarkable feature in our X-ray diffraction patterns, continuous diffuse scattering under the Bragg peaks, will also be discussed along with our PDF (Pair Distribution Function) data. We use the results of optical studies to complement our X-ray structural work.

Persons with disabilities who require special accommodations in attending this lecture should call (713) 743-8210 as soon as possible.

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