

Abstract Submitted
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HgSe Semiconductor Nanoclusters in Zeolite A.M. MILINDA ABEYKOON, University of Houston, E.A. ANOKHINA, MIGUEL CASTRO-COLIN, SIMON C. MOSS, A.J. JACOBSON, W. DONNER, University of Houston — Changing the size of small (10-50 Å) nanoclusters of semi-conductors modifies their optical, electronic, magnetic, thermodynamic, and photocatalytic properties. Therefore there are variety of potential electronic, photochemical and non-linear optical applications of these nanoclusters in the industry. Studying the atomic structures of these nanoclusters is necessary for an analysis of the transition from molecular to bulk semi-conductor properties. Our primary challenge has been to produce HgSe semiconductor nanoclusters with a precise, controllable and narrow size distribution. Since a zeolite framework constrains the size and shape of species encapsulated within a pore, we use zeolite pores to contain our nanoclusters. AXS (Anomalous X-ray Scattering) technique is used in combination with the PDF (atomic pair distribution function) technique to solve for the structure of the nanocluster. We use optical absorption measurements to determine the band gap of the cluster. Finally we intend to perform Raman Spectroscopy to complement our determination of local structure and to probe the electronic properties of the semiconductor nanoclusters.

A.M. Milinda Abeykoon
University of Houston

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