Abstract Submitted
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Anomalous scattering and PDF analysis of HgSe nanoclusters in zeolites using synchrotron X-ray radiation[1] M. CASTRO-COLIN, M. ABEYKOON, S.C. MOSS, W. DONNER, E. ANOKHINA, A.J. JACOBSON, U. of Houston — HgSe, has been grown inside LTL and Nd-Y zeolites (tubular and spherical nanosized pores, respectively). A first sharp diffraction peak appears in an X-ray diffraction profile, that we associate with the clustering of HgSe constrained to the zeolite pore diameter. Charge imbalance within the zeolite pores, combined with the guest material properties, affects the cluster-cluster correlation (clusters in separate pores), either in a filled-unfilled-like fashion or through a relative local orientational order. Such correlations are expressed through a broad diffuse modulation, absent in the pure host, upon which the more obvious, Bragg peaks are imposed. This effect might be seen via pair-distribution function (PDF) analysis. Anomalous scattering experiments carried out both below the Se K-edge and the Hg L-edge, as well as off-edge for each zeolite, aided in calculating average crystallographic parameters of HgSe. These results and the PDF analyses promise to reveal an understanding of the structural configuration and cluster allocation mechanisms. A potential technological application of this system should arise, due to the transparency of these zeolites and ease of interaction of visible light with species contained within the pores.* M.C-C. now at U.T. El Paso

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