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Atomic PDF study of size and structure of CdSe nanoparticles
A. S. MASADEH, G. PAGLIA, E. S. BOZIN, S. J. L. BILLINGE, Department of Physics and Astronomy, Michigan State University, East Lansing, Michigan 48824-1116, A. KARKAMKAR, M. G. KANATZIDIS, Department of Chemistry, Michigan State University, East Lansing, Michigan 48824-1116. — The atomic pair distribution function (PDF) is used to address the size and structure of series of CdSe nanoparticles prepared by the method of distribution focusing [1]. Due to their limiting structure coherence conventional crystallographic methods, such as Rietveld can't be used to assess quantitative size or structural information. Total scattering techniques, such PDF have been successfully applied recently on some similar systems [2, 3]. The PDF includes both Bragg and diffuse scattering and provides quantitative information about the local structure of the materials at different length scales. We report on results of the PDF analysis of synchrotron x-ray diffraction on series of CdSe nanoparticles, data were collected using the rapid acquisition PDF (RA-PDF) technique [4]. [1] X. G. Peng, J. Wickham, A. P. Alivisatos, *J. Am. Chem. Soc.* **1998**, 120, 5343-5344 [2] B. Gilbert, F. Huang,H. Zhang,G. A. Waychunas,J. F. Banfield. S*cience*, 305, 651-654 (2004). [3] R. B. Neder, V. I. Korsunskiy, J. Phys: Condens. Matter 17, 125-134 (2005) [4] P. J. Chupas, X. Qiu, J. C. Hanson, P. L. Lee, C. P. Grey and S. J. L. Billinge. J. Appl. Crystallogr. 36, 1342-1347 (2003).

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