Abstract Submitted
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Self-assembly of Eu_2O_3 nanoneedles and nanocrystals JAMES DICKERSON, Dept. of Physics and Astronomy, Vanderbilt University, SAMEER MAHAJAN, Interdisciplinary Program in Materials Science, Vanderbilt University, MARCELA REDIGOLO, Dept. of Physics and Astronomy, Vanderbilt University, DMITRY KOKTYSH, Department of Chemistry, Vanderbilt University — Growth of anisotropic nanostructures starting from isotropic nanostructures is observed in Eu_2O_3 system. Anisotropic structures, like nanoneedles and nanospindles, are grown from the concentrated solution of Eu_2O_3 nanocrystals. This process involved the stepwise thermal growth of nanocrystals into ordered, high aspect ratio, one dimensional nanoneedles and the subsequent assembly of said nanoneedles into larger, oriented bundles (nanospindles). The Eu_2O_3 nanocrystals were synthesized following a room temperature, colloidal chemistry procedure, adapted from the synthesis of G. Wakefield *et al.*[1] We present the results of this self-assembly phenomenon using 4-nm Eu_2O_3 nanocrystals. High resolution transmission electron microscopy was employed to characterize the approximate shape, size distribution, and crystallinity of the nanostructures. Absorption and photoluminescence measurements were performed to investigate what effect the size and shape of materials has on optical properties. 1. G. Wakefield, H. A. Keron, P. J. Dobson, and J. L. Hutchison, J. of Coll. Interf. Sci. **215**, 179, 1999.

James Dickerson
Dept. of Physics and Astronomy, Vanderbilt University

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