

Abstract Submitted
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Surfactant Directed Assembly of ZnS Nanocrystals YOU LI, CYRUS SAFINYA, JACOB ISRAELACHVILI, University of California Santa Barbara, NATALY BELMAN, YUVAL GOLAN, Ben Gurion University of the Negev, Israel — Post-synthesis assembly of nanocrystals into ordered two- and three-dimensional super-structures is an important step in many technological applications. A method was developed to use chain-crystalline surfactants to link nanocrystals into 2D and 3D assemblies with precise control of inter-particle distances as well as crystallographic orientation of the nanocrystals. X-ray diffraction and transmission electron microscopy data revealed that ZnS nanocrystals synthesized in octadecylamine (ODA) self-assemble into a highly ordered structure composed of stacked sheets with in-plane 2D-crystalline order. The unit cell of the nanocrystal superlattice (including type and dimensions) is directly related to the crystal structure of the pure surfactant, and thus can be tuned predictably by varying the surfactant chain length. This method can be used to assemble a broad range of nanocrystals and particles (Work supported by ONR N00014-05-1-0540, DOE DE-FG02-06ER46314, NSF DMR-0619171 and BSF 2002059).

Youli Li
University of California Santa Barbara

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