

Abstract Submitted
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Synthesis and Characterization of CdS/CdS_xSe_{1-x} Nanowires¹

KLEYSER AGUEDA LOPEZ, MARVIN WU, North Carolina Central Univ — Semiconductor nanowire heterostructures are of interest for potential applications in solar cells and other advanced optoelectronic devices. We report here on synthesis of CdS/CdS_xSe_{1-x} nanowires (NWs) using a dual source vapor = liquid – solid technique, and characterization of these NWs with scanning electron microscopy and optical microscopy. We determine the effect of growth parameters, including source / substrate temperatures and time of exposure, on NW size, shape, and composition. The crystal structure and optical properties individual NWs from selected substrates has been mapped using transmission Kikuchi diffraction and photoluminescence (PL) microscopy. NWs consistently exhibit a hexagonal structure, with growth along the c-axis. Strong PL peaks are observed between the expected bandgap emission from CdS and CdSe, confirming formation of CdS_xSe_{1-x}. PL peaks vary significantly with intensity along the long axis of the nanowire, suggesting that the NW surface is not uniformly passivated. These nanowires show promise for future investigation and manipulation of energy band gaps contain in CdS/CdSe.

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