

Abstract Submitted
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Synthesis and spectroscopic characterization of cadmium sulfide nanowires¹ NARAYANAN KUTHIRUMMAL, College of Charleston, JASON REPPERT, Clemson University, BRIAN DIEHL, College of Charleston, APPARAO RAO, Clemson University — Pulsed laser vaporization method has been used for preparing cadmium sulfide (CdS) nanowires of 50 – 100 nm in diameter. The morphology and crystallinity of as-prepared CdS nanowires are studied by means of X-ray diffraction, scanning electron microscopy (SEM), and high-resolution transmission electron microscopy (HRTEM). Excellent ordering of the lattice planes perpendicular to the [001] plane has been observed. Photoacoustic (PA), UV-Vis, Raman, and photoluminescence spectroscopy have been used to measure the optical properties. PA spectra yielded a steeper absorption edge for as-prepared CdS nanowires when compared to the conventional optical absorption spectrum. The increased steepness might be attributed to the well-ordered structure and size distribution. The data shows that PA spectroscopy is an excellent technique to investigate opaque and highly light scattering samples. Raman data suggests increased exciton-LO phonon coupling in CdS nanowires. The appearance of a narrow photoluminescence peak at 491 nm (FWHM of 9 nm) and the absence of emission above 500 nm demonstrate the high quality of nanowires.

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