

## Synthesis of $\text{CdS}_x\text{Se}_{1-x}$ nanostructures and their optical properties

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We report  $\text{CdS}_x\text{Se}_{1-x}$  ( $0 \leq x \leq 1$ ) ternary nanowires synthesized by a pulsed laser ablation and their optical properties analyzed by photoluminescence (PL). The diameter and length of the nanowires in the whole range of the composition are 50-100 nm and several tens of micrometers, respectively. X-ray diffraction analysis shows that the resulting nanowires have a hexagonal wurtzite crystalline structure. It also exhibits that the diffraction peak was shifted toward the higher value of 2 theta as the value of x increases, which indicates that the lattice constant and unit cell volume decreases linearly with the value of x. Furthermore, we also present PL characteristics of the resulting alloy nanowires. Based on the PL properties, we found that the direct band gap energy of the nanowires scales linearly with the value of x.