

RESEARCH ARTICLE | MAY 08 2018

Investigation of structural, morphological and opto-electronic properties of CdS quantum dot thin film

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AIP Conf. Proc. 1953, 100073 (2018)

<https://doi.org/10.1063/1.5033009>

We have successfully deposited CdS quantum dot thin film on the glass substrate by simple and economic chemical bath deposition method at ~ 50 °C. The X-ray diffraction study confirms the formation of CdS when compared with standard JCPDS data with average crystallite size ~ 3 nm. The morphology of the film was studied by FE-SEM, which suggests the homogeneous and uniform deposition of the CdS material over the entire glass substrate with a porous structure. From UV absorption spectra we observed that the sample exhibited a band edge near ~ 400 nm with a slight deviation with the presence of excitonic peak for the sample. The presence of excitonic peak may be attributed to the formation of quantum dots. The calculated band gap energy of CdS quantum dot thin film was found to be ~ 3.136 eV. The thin film further characterized to study electrical parameters and the sample show a drastic increase in current after light illumination.

Topics

[Electrical properties and parameters](#), [Glass](#), [Absorption spectroscopy](#), [Quantum dots](#), [Thin films](#), [X-ray diffraction](#), [Transition metal chalcogenides](#)

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