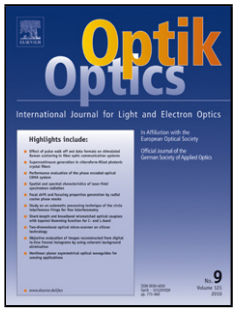

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PII: S0030-4026(17)31445-6
DOI: https://doi.org/10.1016/j.ijleo.2017.11.042
Reference: IJLEO 59956

To appear in:

Received date: 8-9-2017
Accepted date: 6-11-2017

Please cite this article as: { https://doi.org/

Growth of Er^{3+}-doped PbS nanocrystals by chemical bath

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Abstract: The growth of Er^{3+}-doped PbS thin films and the changes of structural, morphological, electrical and some optical properties were examined. The thicknesses of these films were found in the ~200-350 nm range. The morphological properties of the nanocrystals were analyzed using Atomic Force Microscopy (AFM). FTIR spectra showed strong sharp absorption located at ~1447 cm^{-1} associated with the asymmetric stretching vibrations assigned to the bending out-plane vibrations of CO_3^{2-} ions. X-ray diffraction displayed a cubic phase in all films and grain size (GS) was ~6.5 nm for PbS, whereas for doped nanocrystals was ~5.1 nm. Absorption bands located at ~371nm (~3.3 eV), ~385 nm (~3.2 eV), 406 nm (~3.0 eV), ~608 nm (~2.0 eV), ~619 nm (~2.03 eV), ~640 nm (~1.9 eV), and another intense band located at ~682 nm (~1.8 eV) were observed. An optical absorption band located at ~371nm (~3.3 eV) was observed in doped films, corresponding