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Comparative Study of PbS and CdSe quantum dots for use in Luminescent Solar Concentrators[1] GEORGIY SHCHERBATYUK, RICHARD INMAN, SAYANTANI GHOSH, School of Natural Sciences, University of California, Merced, CA 95343, USA , CHUNHUA WANG, ROLAND WINSTON, School of Engineering, University of California, Merced, CA 95343, USA — A comparative study for absorption, redshift and photovoltaic (PV) cell response has been performed for Luminescent Solar Concentrators (LSCs) with embedded PbS and CdSe quantum dots (QDs). LSCs are planar non-tracking devices where the incident solar radiation is absorbed by a fluorescent species embedded in a polymer or glass plate which down-convert and re-emit the solar radiation at longer wavelengths. The emitted light is trapped in the concentrator plate by total internal reflection, transported and emitted at the four edges, where the photons are collected by PV cells. Based on nearly double the current generated by the PV cell in prototype devices, we have concluded that for the purpose of embedding in the LSC PbS quantum dots outperform CdSe. The results are linked to smaller self absorption observed in PbS QD solution and broader absorption spectrum of these QDs.

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