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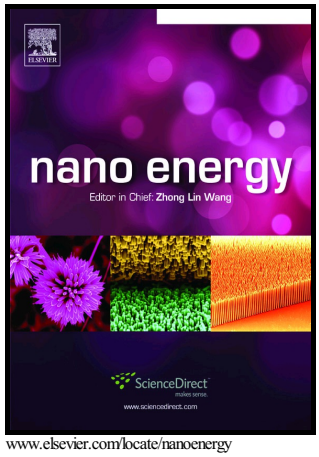

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ABSTRACT

For semitransparent solar cells (SSCs) the photovoltaic efficiency and the transparency are the two primary objectives for utilization in for example building integrated photovoltaics. Solution-processed PbS colloidal quantum dot (CQD) has strong light absorption in the ultraviolent region and possess the advantages of tunable bandgap in the visible and infrared region. Herein we report a PbS CQD-SSC with tunable infrared light absorption and high photostability by combining experimental studies and numerical theoretical simulations. Through fine-controlling the electro-optics in the CQD-SSC and by using a solution-phase ligand exchange for the CQD solid film deposition, the power loss in the device is significantly decreased, yielding a CQD-