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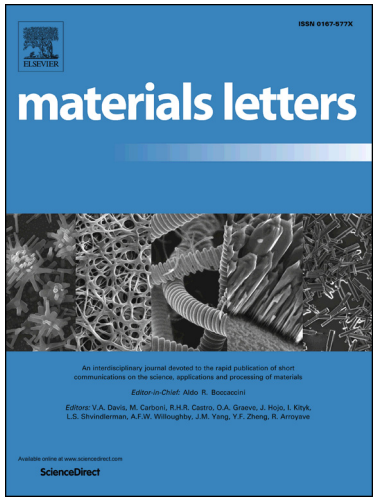

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Doping as an Effective Recombination Suppressing Strategy for Performance Enhanced Quantum Dots Sensitized Solar Cells

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Abstract: In this work, doping manganese into quantum dots is proved as an effective method to suppress charge recombination and improve photovoltaic performance in the doped quantum dot sensitized solar cells (QDSSCs). The results demonstrate more quantity photons are utilized by quantum dots in the broader absorption range. The doped QDSSCs shows the suppressed charge recombination, extended electron lifetime and increased electron injection efficiency for solar cells with Mn dopant by current-voltage measurement and others characteristics methods. As a result, the power conversion efficiency of Mn-CdS/CdSe co-sensitized QDSSCs exhibits 7.16%, which is clearly higher than 5.54% for QDSSCs without Mn dopant. The enhancement is ascribed to an intermediate energy level of Mn-CdS, which improves light harvest and accelerates the charge separation.

Keywords Doping; Suppress charge recombination; Photovoltaic performance; Intermediate energy level; Charge separation

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