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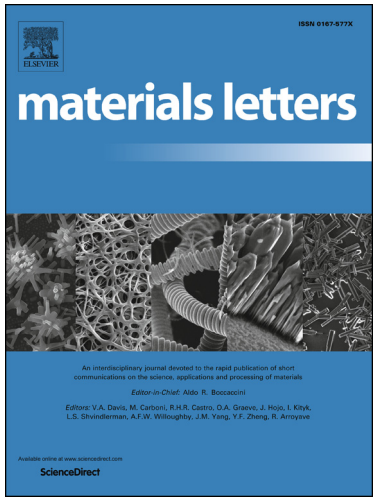

Ag_2S quantum dot sensitized Zinc Oxide photoanodes for environment friendly photovoltaic devices

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Ag_2S quantum dot sensitized Zinc Oxide photoanodes for environment friendly photovoltaic devices

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Abstract:

Simple and a facile chemical solution strategy was utilized for the synthesis of ZnO nanoparticles (NPs) and then Ag_2S quantum dots (QDs) were deposited on the surface of ZnO NPs by a successive ionic layer adsorption and reaction deposition method. The formation of Ag_2S QDs on ZnO films significantly improved the performance of quantum dot sensitized solar cells (QDSCs). The higher photoconversion efficiency, 2.41% was achieved for the ZnO–Ag_2S 6-cycles photoanode which corresponds to an increase of 35% when compared with bare ZnO electrode. The improved photoconversion efficiency of the ZnO–Ag_2S QDSCs is attributed to the Ag_2S sensitization which broadened the absorption into visible light region and exhibits higher short-circuit current density (J_{sc}) values.

Keywords:

Nanoparticles; Solar energy materials; ZnO films; Ag_2S quantum dot sensitization; SILAR deposition; Photoconversion efficiency.

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