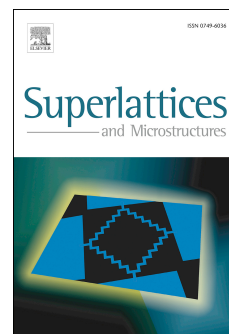


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Voc enhancement of a solar cell with doped Li^+ -PbS as the active layer

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Abstract: In this report, we investigate the fabrication of solar cells obtained by chemical bath technique, based on CdS as window layer and PbS and PbS- Li^+ -doped as the active layer. We report open-circuit-voltage Voc values of ~392 meV for PbS and ~630 meV for PbS Li^+ -doped, a remarkable enhanced in the open circuit voltage is shown for solar cells with doped active layer. Li^+ ion passivate the dangling bonds in PbS-metal layer interface in consequence reducing the recombination centers.

Keywords: Quantum confinement; PbS; Doped active layer; Chemical Bath

1. Introduction

PbS is a semiconductor material employed to convert solar energy into electricity, due to their unique optical properties like quantum confinement and multiexcitonic generation (MEG). Furthermore, PbS can achieve a strong quantum confinement effect when the crystallite dimensions are below the exciton B_{hor} (~18 nm) and such quantum confinement effect allows the band gap energy (E_g) tunability providing a way to control the photosensitivity absorption from infrared to UV-vis regions. In this context, several growth techniques of thin films of PbS have been reported, such as: sol-gel [1], sputtering [2], SILAR [3] and chemical bath (CB) [4, 5]. Some of these techniques have the disadvantage that they operate in high vacuum and high temperature conditions or even in another

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