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Efficient Sb_2Se_3 sensitized solar cells prepared through a facile SILAR process and improved performance by interface modification

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Abstract

Sb_2Se_3 is a potential light harvesting material for photovoltaic cells due to its excellent optical, electrical properties and eco-friendly nature. Herein, an efficient Sb_2Se_3 sensitized solar cell (SSCs) is prepared for the first time through a solution-based successive ionic layer adsorption and reaction (SILAR) process which is flexible, low-cost and easy to access. Aiming to further improve the device performance, a novel approach based on TiCl_4 treatment on mesoporous TiO_2 has been introduced, which is found to optimize the growth condition of Sb_2Se_3 nanoparticles and improve the interfacial surface state, resulting in a better band alignment and a controlled recombination losses in Sb_2Se_3 SSCs. The TiCl_4 treated

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