Short Communication

NiO Nano-Flower Sensitized by Perovskite as Photocathode for p-DSSC with Superior Hole Transfer Kinetics

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NiO nano-flower, NiO slice-cluster and NiO nanoparticles have been synthesized by a facile method. The structure and morphology of the prepared samples were characterized by X-ray diffraction (XRD) and transmission electron microscopy (TEM). The as prepared samples are used as photocathode of p-DSSC. Current-voltage (I-V) curve shows that NiO nano-flower owns the highest J_{sc} of 10 mA cm⁻² and its efficiency can reach up to 0.84%. The UV-vis diffused reflectance spectra indicate that NiO nano-flower shows strong light scattering and diffuse reflection to enhance light harvesting. Electrochemical impedance spectroscopy (EIS), intensity-modulated photocurrent spectroscopy (IMPS), and intensity-modulated voltage spectroscopy (IMVS) further demonstrate that NiO nano-flower provides fast hole transfer, long electron life time and improved charge collection efficiency with suppressed recombination.

Keywords: p-type dye sensitized solar cell; photocathode; NiO nano-flower; perovskite; hole transfer

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