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One step hydrothermal synthesis of CNTs-NiS films for counter electrodes in dye-sensitized solar cells

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Nickel sulfide (NiS) nanoparticles were grew on multiwall carbon nanotube (CNTs) and coated onto FTO-glass by the one step hydrothermal method at 160℃. These films were applied as counter electrodes (CE) for dye-sensitized solar cells (DSSCs). In the present work, electrocatalytic activity and electron-charge transfer resistance are investigated though cyclic voltammetry and electrochemical impedance spectroscopy measurements, respectively. Likewise, an effective surface area of counter electrode is presented and analyzed. Power conversion efficiency (PCE) enhancement of up to 24% (7.48% efficiency) from pure NiS (6.21% efficiency) is demonstrated for a CNTs-NiS DSSC.

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