SYNERGISTIC EFFECT OF MOLYBDENUM SULFIDE AND NICKEL SULFIDE BILAYERNANOSHEETSFILMS FOR COUNTER ELECTRODES IN DYE-SENSITIZED SOLAR CELLS

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In this work, we preparedmolybdenum sulfide and nickel sulfide bilayernanosheets(MoS/Ni3S2) films for using as co-catalyst materials in dye-sensitized solar cells (DSSCs). The monolayer of Ni3S2 was coated on conductive glassbychemical bath deposition technique. After that, MoS was deposited on the surface of Ni3S2by sputtering process tomake bilayer films. The MoS/Ni3S2bilayer films were used as counter electrodes (CE) forDSSCs. Crystal structure of counter electrode films was determined byX-ray diffraction (XRD). The counter electrode morphology was characterized by High resolution scanning electron microscopy (HR-SEM). The synergistic effect was studied via the cyclic voltammetry (CV) and the electrochemical impedance spectroscopy (EIS)for investigating electrocatalytic activity property of counter electrode. The power conversion efficiency of MoS/Ni3S2 DSSC enhancement of up to 9.36%, compared with Pt-DSSC (8.55%).

Keywords - Dye-Sensitized Solar Cells, Counter Electrodes, Molybdenum Sulfide, Nickel Sulfide, Bilayernanosheets.