

Thermally deposited NiO thin film as hole transporting layer for p-i-n perovskite solar cells

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Among the metal oxides, NiO displays high conduction bands and excellent hole transporting properties because of its good stability and high hole mobility. This work demonstrates a two-step procedure for the deposition of NiO thin film as HTL for the fabrication of p-i-n perovskite solar cells (PSCs). In first step, a nickel layer was deposited on FTO substrates by a thermal evaporation technique and then subjected to annealing at 500 °C for the oxidation of Ni to NiO. The FESEM analysis exhibited the uniform deposition of thin NiO layer with the thickness of ~180-200 nm. Other characterizations like optical and the crystalline phases, confirmed NiO layer deposition over FTO substrates. It is expected that the thermally deposited NiO thin film as HTL in PSCs would contribute to a high charge transportation, resulting to a high photovoltaic performance.