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Sol-gel processed CZTS thin film solar cell on flexible molybdenum foil

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Abstract: By a simple and economical sol-gel and spin-coating technique, fine quality Cu_2ZnSnS_4 (CZTS) thin films were formed on flexible molybdenum foils. The CZTS thin films annealed at 500℃ possessed good compositional, morphological, structural, optical and electrical properties for solar cells. The best flexible solar cell with a structure of Mo foil/CZTS/CdS/ZnO/AZO/Al exhibited a power conversion efficiency of 2.25%, with short circuit current density of 13.52 mA/cm^2, open circuit voltage of 370 mV and fill factor of 0.45. Meanwhile, the PV performances of the flexible CZTS-based solar cell on molybdenum foil were investigated in detail.

Keyword: Sol-gel method; Cu_2ZnSnS_4 thin film; flexible molybdenum foil; solar cell; photovoltaic properties

1. Introduction

Thin film solar cells based on kesterite materials of Cu_2ZnSnS_4 (CZTS) have got