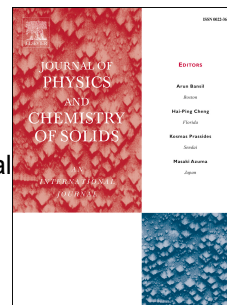


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Simplified and Quick Electrical Modeling for Dye Sensitized Solar Cells: an Experimental and Theoretical Investigation

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ABSTRACT

This work presents a new and simple method for determining I_{PH} (current source dependent on luminance), I_0 (reverse saturation current), n (ideality factor), R_P and R_S , (parallel and series resistance) to build an electrical model for dye sensitized solar cells (DSSCs). The electrical circuit parameters used in the simulation and to generate theoretical curves for the single diode electrical model were extracted from I-V curves of the assembled DSSCs. Model validation was performed by assembling five different types of DSSCs and evaluating the following parameters: effect of a TiO_2 blocking/adhesive layer, thickness of the TiO_2 layer and the presence of a light scattering layer. In addition, irradiance, temperature, series and parallel resistance, ideality factor and reverse saturation current were simulated.

Keywords

Semiconductors, Electrical properties, Electrochemical Properties, DSSC Electrical modeling

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