

Numerical Model for Investigation of Recombination Mechanisms in Graphene-Bonded Perovskite Solar Cells

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Abstract : It is believed recombination mechanisms in graphene-bonded perovskite solar cells based on numerical model in which doped-graphene structures are employed as anode/cathode bonding semiconductor. Moreover, the dark-light current density-voltage density-voltage curves are investigated by regression analysis. Loss mechanisms such as back contact barrier, deep surface defect in the adsorbent layer is determined by adapting the simulated cell performance to the measurements using the differential evolution of the global optimization algorithm. The performance of the cell in the connection process includes J-V curves that are examined at different temperatures and open circuit voltage (V) under different light intensities as a function of temperature. Based on the proposed numerical model and the acquired loss mechanisms, our approach can be used to improve the efficiency of the solar cell further. Due to the high demand for alternative energy sources, solar cells are good alternatives for energy storage using the photovoltaic phenomenon.

Keywords : numerical model, recombination mechanism, graphen, perovskite solarcell

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