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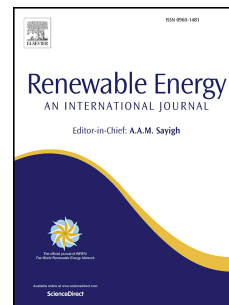
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The effect of Iodide and tri-iodide on the dye sensitized solar cell

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ABSTRACT

The dye sensitized solar cell needs a tremendous improvement to be competitive with other solar cell that are available in the market. To battle this issue a band gap materials engineering needs to be considered. In this study, a numerical model analysis is developed to take into consideration the effect of iodide and tri-iodide on the electron transport through the mesoporous oxide film. For this reason this research intend to solve the continuity equation for the iodide, tri-iodide and the electron transport using FDM method to investigate the effect electrolyte properties on the performance of DSSCs. The simulation results demonstrate that in order to achieve the highest exergy efficiency it is suggested to have electron transport rate above 1.45×10^{-7} (cm/s), the TiO_2 porosity to be in the range of 0.36~0.42, the recombination and the regeneration rate above the 2.693×10^{-7} (cm/s) and 1.55×10^{-7} (cm/s) respectively. The results also showed that peak target of electron transport rate, recombination rate, and regeneration rate enhance the light harvesting efficiency and DSSCs exergy efficiency.

Keyword:

DSSCs, Porosity, Iodie, tri-iodide, exergy, efficiency.

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