Control of the alignment of LC molecular for high PCE in Dye-sensitized solar sell using embedded liquid crystal molecular

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Abstract

This article investigates a new method for improvement of efficiency on a quasi solid-state dye-sensitized solar cell (DSSC) [1]. It is used gel type electrolyte mixing the liquid crystal (LC)[2] because liquid electrolyte has problem of leakage and solid type has low efficiency than gel type[3-6]. And we are applied voltage to DSSC for align LC molecules in electrolyte. By aligning LC molecules, electron transfer is increased and efficiency is enhancement. We compare performance of only mixing LC and applying voltage in a quasi solid-state DSSC.

In this paper, we make experiment in DSSC that is applied voltage to the DSSC for alignment of the LC and have measured the performance which is included electron density at short circuit, open circuit voltage, power conversion efficiency (PCE) and the fill factor according to voltage of existence and nonexistence. As a result, we obtain enhanced efficiency and especially the electron density is shown high increase.

References

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