

## A study on the long-term stability of dye-sensitized solar cells with different electrolyte systems

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The dye-sensitized solar cells (DSSCs) have achieved so far the highest validated efficiency over 11%. However, the cells with the best performance utilize volatile solvent as a electrolyte, which can cause some practical limitations for the long-term operation. This is one of the most substantial problems to be resolved for the commercialization of DSSCs. In order to improve the long-term stability, many research groups have reported new electrolyte system, to replace the liquid type electrolyte by non-volatile ones. In this work, we studied long-term stability of the DSSCs with various types of electrolytes such as (PVDF - HFP) based polymer, eutectic melts of ionic liquids, and liquid based solvent. The cells with various electrolytes have been exposed to the condition under thermal stress and illumination over 1000 hours. We will report the change of photovoltaic properties with time and investigate the degradation mechanism with the impedance spectroscopic analysis.

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