

Quasi-solid electrolytes based on low-molecular weight gelator for efficient photoelectrochemical solar cells

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Electrolyte is one of essential components in diverse electrochemical devices including dye-sensitized solar cells (DSSCs). Traditional liquid electrolytes having a high ion conductivity suffer from a problem of lowering the durability of the electrochemical devices because they have high flowability and volatility. Therefore, to improve the reliability of the electrochemical devices, it is preferable to replace the liquid electrolyte with a quasi-solid electrolyte. However, quasi-solid electrolytes are usually difficult to inject the devices and have a lower ion conductivity due to a higher viscosity than liquid electrolyte. In this study, we have developed a quasi-solid electrolyte which is based on a low molecular weight gelator with high conductivity and stability through proper crosslinking. The prepared quasi-solid electrolytes were systematically analyzed by various electrochemical methods and applied to DSSCs for evaluating their performances. This work was supported by a grant (No.2017000140002/ RE201702218) from the Environmental Industry Advancement Technology Development Project of Korea Environmental Industry & Technology funded by Korea Ministry of Environment.