

Synthesis of a novel alkylimidazolium iodide containing an amide group for electrolyte and application to Quasi-Solid Dye Sensitized Solar Cell with Straight Ion Paths Proposal of Hybrid Electrolytes for Ionic Liquid-Type Electrolytes

정영삼, 권용재*, 최장군
서울과학기술대학교
(kwony@seoultech.ac.kr*)

For DSSC, the electrolytes usually consist of a triiodide/iodide redox couple in organic solvents. However, the disadvantages of using liquid electrolytes are their lower long-term stability, difficulty in robust sealing, and evaporation and leakage of electrolyte in case of breaking of the glass substrates. To overcome these problems, In this study, Quasi-solid dye sensitized solar cells (QDSC) with straight ion paths are reported. The cell consists of anodic oxidation Al₂O₃ films. Ionic liquid-type electrolyte is filled in the straight nanopores and they are sandwiched between a counter electrode and a TiO₂ electrode. we synthesize a new alkylimidazolium iodide (amido-ImI) with the aim of enhancing the conductivities of I⁻ and I₃⁻. The influence of amido-ImI on the performance and longterm stability of the DSSC is investigated and compared to that of the DSSC with 1-hexyl-2,3-dimethylimidazolium iodide (ref-ImI), a commonly used liquid electrolyte. The higher efficiency was explained by the fabrication of ion paths on modified Al₂O₃ surfaces.