

## Strategy to develop long-term stable dye-sensitized solar cells

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Dye-sensitized solar cells (DSSCs) are of great interest due to their attractive features of high energy-conversion efficiency and low production cost <sup>[1]</sup>. Recently, DSSCs employing quasi-solid polymer electrolytes have been investigated because of their intrinsic advantages such as no solvent leakage and evaporation <sup>[2, 3]</sup>. To date, however, DSSCs employing polymer-based electrolytes have exhibited low cell efficiency. This is mainly attributed to the inferior mass-transfer rates of the redox couples ( $I^-/I_3^-$ ) in the highly viscous medium and to high electron-transfer resistance at the electrolyte/electrode interfaces. Therefore, it is necessary to increase the ion mobility in the polymer medium to improve cell efficiency. Although many efforts have been made through using new polymers, inorganic nanofillers and small molecule plasticizers to increase the ion conductivity, a better understanding of polymer-based electrolytes is required. For practical use of highly viscous polymer-based electrolytes, moreover, the electrolyte filling process is significantly important to commercialize DSSC. In this presentation, recent researches on the development of long-term stable DSSCs and the design of polymer-based electrolytes to improve both the ion conductivity and stability will be introduced.

### References

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