

# **Ru(II) COMPLEXES CONTAINING EXTENDED $\pi$ -CONJUGATION BIPYRIDYL ANCILLARY LIGAND: SYNTHESIS AND APPLICATION FOR DSSCs**

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The market for dye sensitized solar cells (DSSCs) has attracted much attention as the rising demand of alternative energy resources. DSSCs have been under extensive research due to the use of abundant and cheap materials resulting in low production cost. As results of continuous of efforts for improving power conversion efficiency, various ruthenium(II) complexes for DSSCs are getting established as one of the main streams for alternative energy resources.<sup>[1]</sup>

Up to now, our group has made continuous efforts for the developing new heteoleptic ruthenium(II) complexes by varying the ancillary and the anchoring ligand to a ruthenium(II) center that are expected high conversion of sunlight to electricity.<sup>[2]</sup> One of the important things improving the power conversion efficiency is that dye should absorb light over a wide wavelength range especially in the visible region with a high molar extinction coefficient. Therefore, we have designed and prepared heteroleptic ruthenium(II) complexes using a differently  $\pi$ -conjugated and/or substituted ancillary ligand with a proper anchoring ligand. Synthesized ruthenium(II) complexes were characterized using analytical, spectroscopic, and electrochemical techniques. Dye-sensitized solar cells based on new heteoleptic ruthenium(II) complexes show noble power conversion efficiencies compared to N719-based standard cell.

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[1] Jiang, K. J.; Masaki, N.; Xia, J. B.; Nodab, S.; Yanagida, S. *Chem. Commun.* **2006**, 2460–2462.

[2] Lee, J.; Seo, J.; Choi, Y. R.; Oh, H.; Huh, J. N.; Park, B.; Tak, J.; Kim, B. H. *Helv. Chim. Acta.* **2018**, *101*, e1800030.