

DIPYRRIN-INCORPORATING Ru(II) POLYPYRIDYL COMPLEXES: A NEW PARADIGM FOR SOLAR CELL

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Dye-sensitized solar cells provide an efficient and relatively inexpensive method for solar energy conversion.¹ The efficiency depends in large part on dye's performance. Recent efforts in the field have revealed that integrated absorptivity of Ru-polypyridyl dyes can be improved by using a chelating σ -donor ligand and introducing electron-donating substituents to shift the MLCT band to longer wavelengths and enhance its molar extinction coefficient. Thiophene-functionalized dipyrins not only satisfy both of these conditions, but also exhibit an intense absorption band in the visible region due to the π - π^* transition of the dipyrin moiety.² To probe the usefulness of these ligand for the preparation of solar cell sensitizers, we have synthesized and characterized model Ru(II) complexes, $[\text{Ru}(\text{bpy})_2(3\text{-TDP})](\text{PF}_6)$ and $\text{Ru}(\text{bpy})(3\text{-TDP})_2$ (3-TDP = 3-thienyldipyrinato anion). This contribution will discuss the photophysical and electrochemical properties of these complexes, as well as their prospects for the use as solar cell sensitizers and precursors to photoconducting materials.

1. Grätzel, M. *Inorg. Chem.* **2005**, 44, 6841

2. Wood, T. E.; Thompson, A. *Chem. Rev.* **2007**, 107, 1837