

LIGHT INDUCED CHARGE TRANSFER EVENTS AT THE INTERFACE OF MOLECULAR MATERIALS

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In this communication we present the results obtained in our group regarding studies on the light induced electron transfer between the different components of the photovoltaic molecular devices. In the area of the Dye-Sensitised Solar Cells (DSSC),¹ we have used new dyes to improve the control over the electron injection dynamics (Figure 1). We have observed an improvement of the efficiency of the devices when using tert-butyl functionalized carboxyphtalocyanines,² and alkyl-derived free base porphyrins,³ and increased photocurrent of the phenantroline-containing Ru (II) dye compared to the widely used N719.⁴

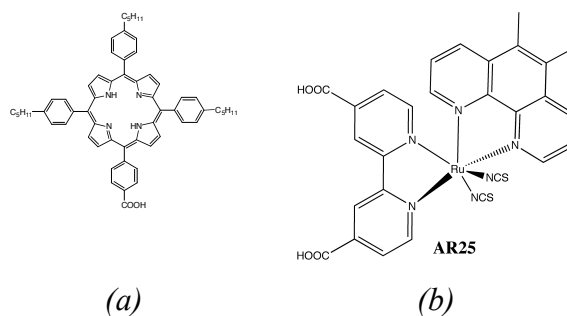


Figure 1. Examples of dyes used in DSSC constructed in our group: (a) 5-(4-carboxyphenyl)-10,15,20-tris(4-pentylphenyl) porphyrin and (b) cis-(4,4'-dicarboxy-2,2'-bipyridine)(5,6-dimethyl-1,10-phenantroline)dithiocyanate ruthenium (II).

Moreover, we are also interested in the study of the organic devices and the influence of the morphology on the resulting photoluminescent properties.

¹ M. K. Nazeeruddin, F. DeAngelis, S. Fantacci, A. Selloni, G. Viscardi, P. Liska, S. Ito, T. Bessho, M. Grätzel, *J. Am. Chem. Soc.* **2005**, *127*, 16835.

² J. J Cid, J. H. Yum, S. R. Jang, Md. K. Nazeeruddin, E. Martínez-Ferrero, E. Palomares, J. Ko, M. Grätzel, T. Torres, *Angew. Chem. Int. Ed.* **2007**, *46*, 8358.

³ A. Forneli, M. Planells, M. A. Sarmentero, E. Martínez-Ferrero, B. C. O'Regan, P. Ballester, E. Palomares, *J. Mater. Chem.* accepted.

⁴ A. Reynal, A. Forneli, E. Martínez-Ferrero, E. Palomares, *Eur. J. Inorg. Chem.* submitted