

## Trisheteroleptic Cycloruthenated Chromophores for the Dye-Sensitized Solar Cell.

Paolo G. Bomben, Javier Borau Garcia and Curtis P. Berlinguette\*

Recent reports have described the viability of cyclometalated ruthenium sensitizers of type  $[\text{Ru}(\text{C}^{\wedge}\text{N})(\text{N}^{\wedge}\text{N})_2]^+$  and  $[\text{Ru}(\text{N}^{\wedge}\text{C}^{\wedge}\text{N})(\text{N}^{\wedge}\text{N}^{\wedge}\text{N})]^+$  as light harvesters in dye sensitized solar cells (DSSC). Improving the performance of these dyes is dependent on broad spectral absorption, large extinction coefficients and redox potentials suitable for electron-transfer with  $\text{TiO}_2$  and the electrolyte. We recently communicated a highly efficient tris-heteroleptic cyclometalated Ru sensitizer, **1**, which achieved a power conversion efficiency of 7.3% - which is much higher than the 6.3% obtained for the benchmark dye **N3** under the same conditions. We have now developed iterations where the 2-hexylthiophene substituents of **1** are replaced by a different organic unit to furnish high-performance dyes of formula **2**. This presentation will detail how the photovoltaic performance of the DSSC can be optimized through the rational design of dyes.

