



RCMS · IGER Seminar



"Molecular Control of Interfacial Electron Transfer In Dye-Sensitised Solar Cells"



Lecturer : Dr. Neil Robertson
(University of Edinburgh)

Date : Fri. 29th June 14:00 – 15:30

Place : Chemistry Gallery

Dye-sensitised solar cells convert solar energy into electrical energy via photoexcitation of dye molecules bound to a wide bandgap semiconductor such as TiO_2 . Following photo-induced electron transfer from the dye to TiO_2 , the dye is regenerated by electron transfer from a redox electrolyte or hole transport material (HTM). The power-conversion efficiency is greatly dependent on the electron transfer processes occurring at the TiO_2 -dye-HTM interface, which can be controlled through the structure of the dye or other surface binding molecules. We will present results to illustrate the consequences of modification of Ru dyes on the interactions at the interface and consequent electron transfer processes in dye-sensitised solar cells. In particular, some common features of Ru dyes are often incorporated without detailed investigation of these aspects. These include the 4,4'-dicarboxy-bipyridine ligand used as a binding unit to TiO_2 and the NCS co-ligand which is believed to play an important role in dye-electrolyte interactions. Accordingly we have modified and probed these common dye features and will discuss the consequences on cell efficiency and stability.

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