

3. Nanostructured Luminescent interfaces for sensing applications: Surface active Iridium and Ruthenium complexes

(with Dr. Andrew Hughes).

The detection of biologically and environmentally relevant molecules, at ultralow concentration (sub-nanomolar), demands the development of novel (spectro-electrochemical transduction approaches. Iridium and Ruthenium complexes have extraordinary luminescent and electrochemical properties, characteristics highly favorable for sensing strategies which exploit both of these properties e.g. electrochemiluminescent (ECL) sensing. By functionalising such molecules with surface active groups, 2D molecular assemblies can be formed on electrode surfaces, see Figure. This project will focus on the synthesis and immobilisation of the luminescent species with a view to their analytical application as nanostructured sensing layers. The project will include synthesis, spectroscopy, surface science and electrochemistry.

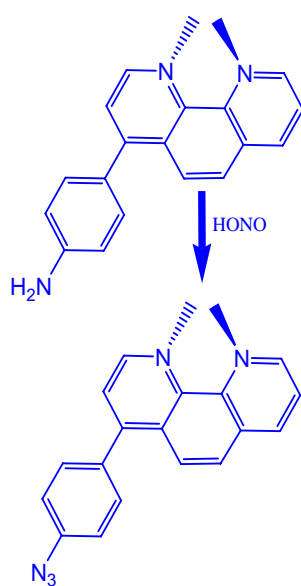


Figure 1 Diazonium ligand formation, in situ or ex situ

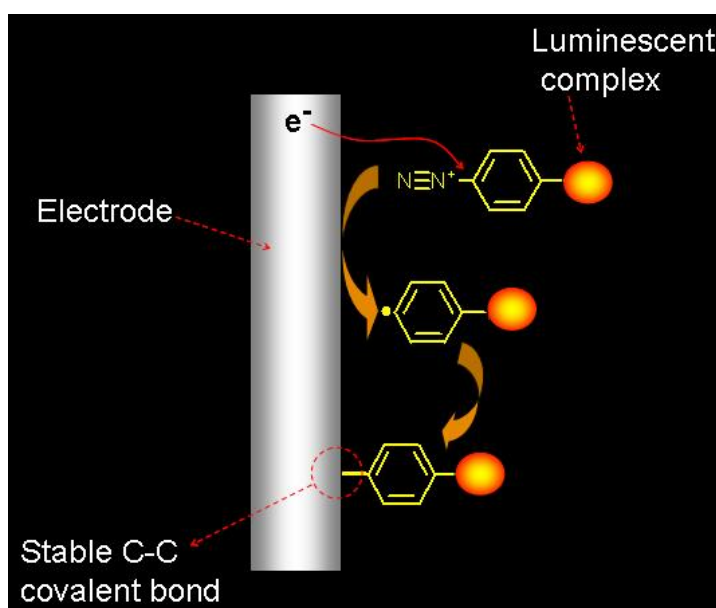


Figure 2 Electrochemically assisted monolayer formation

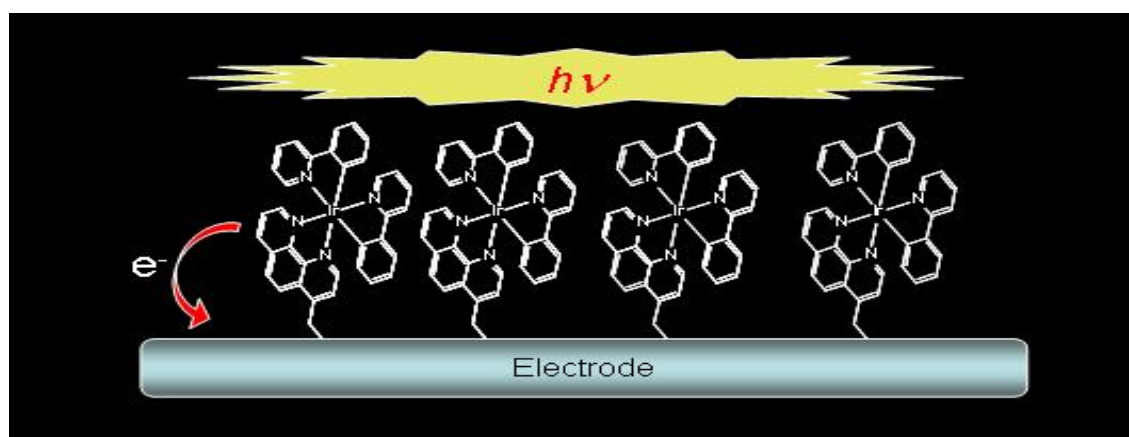


Figure 3 The finished product: An Electrochemically addressable luminescent monolayer.

Chat to someone in the Research group: PhD students Greg Barbante and David Piper are doing some very interesting work in this area.