

Improving the Luminescence Sensitivity of a Series of Polypyridyl Iridium (III) Complexes Upon Encapsulation in Cucurbit[10]uril in Aqueous medium : Binding and Photophysical Studies

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The photophysical properties of the luminescence iridium (III) cyclometalated complexes and their applications are especially interesting for diverse potentials, such as organic light emitting diodes (OLEDs)[1] and as labelling reagent for bio molecules[2] In many cases, water is the preferred medium which sensing will be applied, especially in biological systems. However, for many iridium(III) complexes, they have much weaker luminescence intensity in aqueous systems compared to organic solvents.

Many studies have investigated the effect of the host-guest chemistry on the luminescence properties of different organic and inorganic species, especially by using cucurbit[n]uril host family members (n=6-8). [3, 4] Cucurbit[10]uril (Q[10]) which is the largest cucurbituril member has received modest attention as a host molecule.

Recently we found that Q[10] encapsulation of Ir(III) complex has a dramatic effect on the enhancement of the luminescence properties of iridium(III) complex in aqueous medium.[5] Following this discovery, we extended our work to study the effect of Q[10] encapsulation on the luminescence properties of a series of Ir(III) complexes that have different substituent groups on the ligands, and how these affect the positioning of the Ir(III) complexes within Q[10]. Encapsulation study of these complexes with Q[8] was also investigated in this work.

The substituents were chosen with the objective of enhancing sensing application within fingerprints.

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