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Title:	Facile tuning of the aggregation-induced emission wavelength in a common framework of a cyclometalated iridium(III) complex: micellar encapsulated probe in cellular imaging
Authors:	Karanam, M. (/jspui/browse?type=author&value=Karanam%2C+M.) Choudhury, A.R. (/jspui/browse?type=author&value=Choudhury%2C+A.R.)
Keywords:	Cyclometalated iridium Octahedral Chromophoric
Issue Date:	2014
Publisher:	Royal Society of Chemistry
Citation:	Journal of Materials Chemistry C, 2(28), pp.5615-5628.
Abstract:	A simple synthetic protocol involving two steps was developed for the syntheses of a series of monocyclometalated iridium(III) complexes. Initially, an intermediate, $[\text{IrHCl}(\text{o-C}_6\text{H}_3\text{X})\text{P}(\text{Ar})\text{x}-(\text{PARxRy})_2]$ [A (i, j, k, l)], six-coordinated iridium(III) complex involving a 4-membered chelate was isolated. Then, it was transformed into a monocyclometalated iridium(III) complex, $[(\text{C}^{\wedge}\text{N})\text{Ir}(\text{PARx-1Ry})_2(\text{C}(\text{H}))]$ (1-12), by the replacement of the 4-membered chelates with 5-membered cyclometalates. The intermediates and the complexes were structurally characterized by FTIR, $^1\text{H}$ , $^{13}\text{C}$ and $^{31}\text{P}$ NMR spectroscopies. Octahedral coordination for Ir(III) in 2, 8 and 9 was established by single crystal X-ray diffraction. Photo-physical experiments and quantum chemical calculations revealed a mixed LC/MLCT/LLCT nature for the lowest excited states of all these complexes that emit bright light in the solid state. Fine tuning of the emission wavelength throughout the visible range was achieved by suitable combinations of chromophoric cyclometalates and non-chromophoric aryl phosphine ligands. More interestingly, all the studied complexes were found to be aggregation-induced emission (AIE) active. One of these AIE active materials (6) was encapsulated inside polymeric micelles that inhibit the macroscopic precipitation of the aggregated complex, <200 nm water-soluble particle exhibiting a strong emission. These colloidal luminescent particles were used as a potential non-toxic bio-imaging probe.
Description:	Only IISERM authors are available in the record.
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