

Yellow and Yellowish-green Light-Emitting Electrochemical Cells Using Cationic Iridium (III) imidazole Complexes

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Light-emitting electrochemical cells (LECs) are the next generation of optoelectronic devices and commonly employ ionic transition metal complexes (iTMCs) or conjugated polymers as the light-emitting material. LECs typically consist of ionic species, which are fabricated in solution and utilize air-stable electrodes, allowing the nonrigorous encapsulation of the devices. Recently, LECs based on iTMCs have attracted significant attention owing to their various advantages over polymer-based LECs. Here in, two new cationic heteroleptic iridium(III) complexes with imidazole based-ancillary ligands, namely, $[\text{Ir}(\text{ppy})_2(\text{mphb})]\text{PF}_6$ (complex1) and $[\text{Ir}(\text{ppy})_2(\text{immp})]\text{PF}_6$ (complex2) (ppy is 2-phenylpyridine, mphb is 2-(4-Methyl-2-pyridyl)-1H-benzimidazole, immp is 2-(2-Imidazolyl)-4-methylpyridine and PF_6 is hexafluorophosphate) have been synthesized and characterized by various spectroscopic methods. These synthesized complexes were used for the fabrication of single component light-emitting electrochemical cells (LECs). The materials based on these complexes resulted in yellow emission and yellowish-green emission for complex 1 and complex 2, respectively.