

Light-emitting electrochemical cells employing cationic iridium complexes with green and yellow light emission

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Light-emitting electrochemical cells (LECs) are optoelectronic devices consisting of a single active component of either ionic transition metal complex (iTMC) or inorganic salt incorporated conjugated polymer which produces light under the application of external electric field. Herein, green and yellow light emitting phosphorescent iridium complexes with 5-methyl-1,10-phenanthroline as the ancillary ligand were synthesized and characterized for the fabrication of LEC devices. The photophysical and electrochemical properties of the resulting complexes were investigated by means of UV-visible absorption, fluorescence spectroscopy and cyclic voltammetry. The electroluminescent properties of LECs were investigated which results in a maximum luminance of 2430 and 1549 cd m⁻² for complex 1 and 2 respectively. LECs incorporating these heteroleptic complexes are effectively tuned the emission color through the meticulous selection of cyclometalated ligands and displayed highly luminescent green and yellow electroluminescence.