

Electroluminescent properties of yellow light-emitting electrochemical cells based on a cationic iridium complex and the effect of ionic liquids incorporation in an active layer

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LECs are optoelectronic devices consisting of a single active component of either ionic transition metal complex (iTMC) or inorganic salt incorporated conjugated polymer sandwiched between two metal electrodes. Herein we have synthesized a new cationic iridium complex $[\text{Ir}(\text{ppz})_2(\text{dmphen})]\text{PF}_6$ and characterized by spectroscopic and photophysical methods. Light-emitting electrochemical cells (LECs) were fabricated using the resulting complex and their electroluminescent properties were investigated. LECs based on $[\text{Ir}(\text{ppz})_2(\text{dmphen})]\text{PF}_6$ gave a yellow electroluminescence of 4052 cd m^{-2} at 9.0 V. Furthermore, the luminance of the devices was constructively tuned by doping ionic liquids (ILs) into the light emitting layer. The addition of ILs resulted in enhanced luminance of the devices at shorter turn-on voltages indicating its great potential for display and lighting applications.