

Effect of Ionic Liquids on the Device Performance of Polyfluorene based Light Emitting Electrochemical Cells.

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Light emitting electrochemical cells (LECs) have drawn considerable attention from organic electronics researchers in the last two decades. The concept of LEC was introduced by Heeger et al. in 1995 that put forward an easy way of producing light from organic semiconductor by electrical excitation. The active layer of LECs consists of a thin film made out of homogenized mixture of electroluminescent polymer, ion-conducting polymer, and an inorganic salt. Indium tin oxide sputtered on glass and aluminium deposited by vacuum evaporation functions as cathode and anode respectively. Under the influence of an applied potential, electrons and holes were generated from electrode and eventually recombine to give light. In order to improve the electroluminescent characteristics, ionic liquids were incorporated into the active layer. Electroluminescent polymer with fluorene backbone was chosen as the active material because of its solution processability and thermal stability. Electrical and electro-optical characteristics of the device were studied. The presence of ionic liquids showed a positive effect on the device performance.