

Improvement of Brightness, Color Purity, and Operational Stability of Electrochemiluminescence Devices with Diphenylanthracene Derivatives

황희동, 김진곤[†]

포항공과대학교

(jkkim@postech.ac.kr[†])

Electrochemiluminescence (ECL) is a light emission phenomenon induced by electrochemical redox reactions. In general, the excited state of a luminescent molecule is formed by electron transfer between reduced and oxidized species of the molecule that have been generated electrochemically, thus leading to luminescence. Many materials with RGB (red, green, blue) emitting colors have been developed to meet the requirements for full-color displays. While red and green emitting materials are relatively well developed, satisfactory blue materials with good color purity, high efficiency and good stability are still in demand. Here, we focus on Diphenylanthracene (DPA), the general blue emitting ECL lumiphore, and its ionophilic derivatives. We synthesized the ionophilic derivative of DPA (I-DPA) by attaching the imidazolium groups to the both ends of DPA to enhance the solubility of DPA moiety in solution and suitability for blue emitting ECL devices. We confirmed that I-DPA shows higher intensity, improved color purity, and brighter light with longer emitting than DPA. Furthermore, the flexible devices can be demonstrated by homogeneous ECL gel.