

Preparation of UV-curable QD-PMMA resin and its application to LED device

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Quantum dots (QDs) have attracted great attentions to be the next-generation material in light-emitting devices (LEDs) thanks to its high quantum yield, stability and color accuracy. To apply QDs to LEDs, polymethylmethacrylate (PMMA) and polydimethylsiloxane (PDMS) are frequently chosen as a matrix of QDs. Especially, PMMA shows great optical properties such as high transparency, thermal stability and refractive index. Among various kind of LEDs, micro-LED is thought to be a promising kind of LED because of its high resolution, energy efficiency and applicability to flexible display. When it comes to apply QDs to QD-polymer nanocomposite, it is important to make QDs well-dispersed in nanocomposite. QDs show poor dispersity in methyl methacrylate (MMA) monomer and several researches showed that surface modification of QDs could enhance dispersity of QDs in PMMA. However, it has been reported that direct surface modification of QDs could decrease optical properties of QDs. In this work, we present a novel method of preparing UV-curable QD-PMMA resin and its application to LED devices.