

Improved thermal and moisture stability of quantum dots using cyclic olefin copolymer (COC) as matrix

백선희, 윤채민¹, 이강택^{1,†}
연세대학교 대학원; ¹연세대학교
(ktee@yonsei.ac.kr[†])

Quantum dots are nano-sized semiconductors with electrical and optical properties, such as high color purity, high photoluminescence quantum yield (PL QY), narrow emission bandwidth, and low energy consumption. However, quantum dots are vulnerable to heat and moisture. To apply quantum dots to applications, it is necessary to improve the stability of heat and moisture. To enhance thermal and moisture stability of quantum dots in a nanocomposite, quantum dots nanocomposite was fabricated using cyclic olefin copolymer (COC) with heat resistance, low moisture permeability, and high transparency. Indium-based quantum dots were dispersed in COC solution dissolved in 1,2-dichlorobenzene (O-DCB), and we fabricated nanocomposites by solvent casting method. The stability of quantum dots in the nanocomposite was measured at 70 °C and 85 °C in a convection oven and at 85 °C 85%RH in a thermo-hygrostat. All measurements were performed for 15 days each. Through this study, we confirmed that the stability of quantum dots in nanocomposite was increased.