

### Fabrication of quantum dot-polymer nanocomposites with enhanced optical properties using amphiphilic polymer coated QDs

양갑필, 윤철상, 김정욱<sup>1</sup>, 이강택<sup>†</sup>

연세대학교; <sup>1</sup>서강대학교

(ktnlee@yonsei.ac.kr<sup>†</sup>)

Quantum dots(QDs) have been expected to be the next-generation material in light-emitting devices(LEDs) because of their high color purity, quantum yield, and photochemical resistance. To apply QD to LEDs, polymers such as PDMS(Polydimethylsiloxane) or PMMA(Polymethylmethacrylate) are used as a QD loader. In QD-polymer film, however, optical properties of QD decrease because of QDs' aggregation and FRET between QDs. To solve this problem, we present the QD-polymer nanocomposite showing enhanced optical properties compared to conventional QD/PDMS nanocomposites. We prepared QD-polymer nanocomposite by encapsulating QD with PSMA(Polystyrene-co-maleic anhydride) then the QD-PSMA were crosslinked with PDMS to produce QD-PSMA/PDMS nanocomposite film. During fabrication, we don't need thermal or UV curing step because QD-polymer nanocomposite was fabricated by ring opening reaction between anhydride in PSMA and diamines of aminopropyl-terminated PDMS at room temperature. By analyzing optical and thermal properties, we observed possibility of applying QD-polymer nanocomposites to LEDs.