

Fabrication of highly luminescent QD/polymer composite film with uniform dispersion by condensation reaction between QD and silane precursor and its application to White LED

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High photoluminescence efficiency of quantum dot (QD)/polymer composite film is necessary to QD LED. We investigate the change in quantum yield(QY) of QD in sol-gel hybrid silicone resin with controlling dispersion. We incorporate QD within high refractive index silicone resin. By surface modification of QD, sol-gel condensation reaction can occur between QD and silane precursors. We think that uniform dispersion of QD in silicone resin by sol-gel condensation method has higher QY compared to simple blending method between QD and silicone resin. Dispersion and QY is measured by confocal microscopy, TEM, and integrating sphere. We fabricate white light emitting diodes by stacking red and green emitting films or blending red and green emitting film. This work was supported by the National Research Foundation of Korea (NRF) grant (No. 2011-0029118) and the Industrial Strategic Technology Development Program (No. 10035387) funded by the Ministry of Knowledge Economy (MKE, Korea).