

## Color Conversion Films with CuInS<sub>2</sub>/ZnS Quantum Dots Embedded Polystyrene Nanofibers by Electrospinning Process

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**Abstract :** Quantum dots (QDs) are getting attentions due to their excellent optical properties in display, solar cell, biomolecule detection and lighting applications. Energy band gap can be easilty controlled by controlling their size and QDs are proper to apply in light-emitting-diode(LED) and lighting application, especially. Typically cadmium (Cd) containing QDs show a narrow photoluminescence (PL) spectrum and high quantum yield. However, Cd is classified as a hazardous materials and the use of Cd is being tightly regulated under 100ppm level in many countries. InP and CuInS<sub>2</sub> (CIS) are being investigated as Cd-free QD materials and it is recently demonstrated that the performance of those Cd-free QDs is comparable to their Cd-based rivals. Due to a broad emission spectrum, CuInS<sub>2</sub> QDs are also proper to be applied to white LED. For the lighting applications, the QD should be made in forms of color conversion films. Various film processes are reported with QDs in polymer matrixes. In this work, we synthesized the CuInS<sub>2</sub> (CIS) QDs and QD embedded polystyrene color conversion films were fabricated for white color emission with electro-spinning process. As a result, blue light from blue LED is converted to white light with high color rendering index (CRI) of 72 by the color conversion films.

**Keywords :** CuInS<sub>2</sub>/ZnS, electro-spinning, color conversion films, white light emitting diodes

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