

Highly Luminescent Multi-shell Structured InP Quantum Dot for White LEDs Application

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So many groups have been researching the green quantum dots such as InP, InP/ZnS for overcoming the semiconductor nanoparticles composed with heavy metals like as Cd and Pb so on. In spite of much effort to keep up CdSe quantum dots, it does not reach the good properties compared with CdSe/ZnS quantum dots. This quantum dot has improved its properties through the generation of core/shell CdSe/ZnS structure or core/multi-shell structures like as CdSe/CdS/ZnS and CdSe/CdS/CdZnS/ZnS. In this research, we try to synthesize the InP multi-shell structure by the successive ion layer absorption reaction (SILAR) in the one pot. The synthesized multi-shell structure has improved quantum yield and photo-stability. To generate white light, highly luminescent InP multi-shell quantum dots were mixed with yellow phosphor and integrated on the blue LED chip. This InP multi-shell improved red region of the LEDs and generated high CRI.

Keywords: Quantum dot, LED