

Design of BaAl<sub>2</sub>O<sub>4</sub>:Eu phosphor for Long-UV LED application via controlling host composition and Eu concentration

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Recently, nitride or oxynitride phosphors are reported to have good luminescence properties for white LEDs applications. For oxide phosphors, N-doping in oxygen sites increases the covalent bond, leading to change the luminescence characteristics suitable for the application in long-UV or blue LEDs. Eu-doped BaAl<sub>2</sub>O<sub>4</sub> is known as an excellent phosphor for persistent luminescent material. Most of researches are focusing on the luminescence control of BaAl<sub>2</sub>O<sub>4</sub>:Eu phosphor via co-doping activator ions (for example, Eu<sup>2+</sup> with Dy<sup>3+</sup>). In this work, spray pyrolysis was applied to design the luminescence properties of BaAl<sub>2</sub>O<sub>4</sub> used as a host. Some portion of Al was replaced by Si and the Eu concentration was changed. Two types of Si sources were used in order to investigate the possibility that nitrogen is incorporated into oxygen sites. More detailed luminescence properties characterized by XRD, PL, XPS, EDX, and UV-visible measurement were presented.