

Spectral tuning in nitride phosphors by compositional tailoring

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The *luminous efficiency* of white LEDs depends not only on the photoluminescence efficiency but also on the photoluminescence spectra of phosphors used. The brightness of phosphors is getting high when the emission peak approaches the maximum of the eye sensitivity curve. On the other hand, the *color rendering index* or *color gamut* of wLEDs mainly relies on the spectral shape. Therefore, to achieve high luminous efficiency, color rendering index, or color gamut of white LEDs, it is necessary to modify the photoluminescence spectrum of phosphors. Covalent nitride phosphors have been considered as one of the most promising down conversion luminescent materials in white LEDs, and a number of sialon-based nitride phosphors have been developed during the past decades. In this presentation, we will discuss the photoluminescence spectra tuned by tailoring the chemical composition of the phosphors, such as the cationic substitution, cationic/anionic double substitutions, and the selection of different dopants.