

## Control of Spectral Properties of $(Y_{1-x}La_x)_3Al_{5-2y}(Mg,Si)_yO_{12}:Ce$ Phosphor Prepared by Spray Pyrolysis

메릴추아마니퀴즈, 정경열\*  
공주대학교

(kyjung@kongju.ac.kr\*)

Yttrium Aluminum Garnet doped cerium is said to be the most potential phosphor material which can convert blue emission from blue LEDs into white light LEDs. However, this phosphor is thought to have lack of emission in the red spectral region and/or limited chromaticity zone of yellow luminescence, which can hinder its good color rendering properties for WLEDs. The emission wavelength and chromaticity zone of YAG:Ce can be controlled by substituting ions into the  $Y^{3+}$  and  $Al^{3+}$  site. This work was undertaken in an attempt to control the spectral properties of YAG:Ce phosphor by substituting  $La^{3+}$  and  $Mg^{2+}-Si^{4+}$  ions into the  $Y^{3+}$  and  $Al^{3+}$  site, respectively, such that the emission peak position would be similar with the commercial YAG:Ce (545nm). The effects of  $La^{3+}$  and  $Mg^{2+}-Si^{4+}$  substitution on the PL properties were investigated and the comparison on PL properties has been made with the commercial YAG:Ce. A continuous shift in the emission wavelength of YAG:Ce was observed with increasing the  $Mg^{2+}-Si^{4+}$  content. The phosphor having a composition of  $Y_{2.97}Mg_{0.4}Al_{4.2}Si_{0.4}O_{12}:Ce_{0.03}$  showed an emission peak similar with the commercial YAG:Ce and larger band width of emission.