

## Synthesis of YAG:Ce phosphor particles using supercritical water system

윤민재, 손상하, 이재혁, 이현철<sup>1</sup>, 이창하\*  
연세대학교; <sup>1</sup>삼성전기 생산기술팀  
(leech@yonsei.ac.kr\*)

Phosphor yttrium aluminum garnet  $Y_3Al_5O_{12}$  (YAG), activated with trivalent cerium ( $Ce^{3+}$ ) was synthesized under supercritical water (SCW) conditions. Typical methods for synthesizing YAG phosphors are solid-state, sol-gel, hydrothermal, precipitation, combustion, etc. Especially, synthesis of YAG:Ce phosphor using supercritical water is known to be superior to the other methods in the view point of energy conservation because this method is operated for a short time at comparatively low temperature. The effects of process condition of the SCW system in the crystallization, morphology and luminescence properties of phosphor particles were investigated. The formation of YAG:Ce was investigated by means of XRD. The purified YAG crystalline phases were obtained under supercritical water condition. SEM shows that the particles have uniform size. The emission spectrum of synthesized YAG:Ce under SCW conditions was observed between yellow and green spectral area. Therefore, unlike traditional method, SCW method could be reduced time and expense because it doesn't need post-treatment and long time reaction. And this method using SCW can be proposed as new method to synthesize YAG:Ce phosphors.