

Synthesis and Photoluminescence of YAG:Ce Phosphor by Microwave and Precipitation Method

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White light-emitting diode (LED) is considered as a next generation light source because it is environmental friend as well as high efficiency. Phosphor plays a key role of determining the output light power, the efficiency, and the color rendering property of LED goods. Thus, the preparation technology of efficient phosphor is of importance to make high-quality LEDs. $Y_3Al_5O_{12}:Ce$ (YAG:Ce) phosphor is yellow phosphor and currently used for InGaN based blue LEDs. In this work, $Y_3Al_5O_{12}:Ce$ phosphor was synthesized by conventional precipitation and microwave synthesis. The luminescent and the physical properties were comparatively studied. The YAG:Ce powder prepared by the microwave method had pure YAG phase even though low calcination temperature (1000 °C), whereas, the sample prepared by the conventional precipitation needed high calcination temperature of higher than 1100 °C to make pure YAG phase. As a result, the YAG phosphor prepared by the microwave synthesis had higher luminescent intensity than that of the sample by the conventional precipitation. More details about the crystallinity, morphology, and luminescent properties were presented.