

Luminescent properties under Vacuum Ultraviolet (VUV) excitation of (Y,Gd)Al₃(BO₃)₄:Eu³⁺ red phosphors prepared by spray pyrolysis

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(Y, Gd)Al₃(BO₃)₄/Eu³⁺ red phosphor was prepared by spray pyrolysis and the photoluminescence (PL) characteristics under vacuum ultraviolet (VUV) excitation were investigated by varying the Y/Gd ratio, Eu content, preparation temperature, and the host composition. The (Y, Gd)Al₃(BO₃)₄:Eu³⁺ showed line emission at 615 nm under VUV excitation (147 nm). The concentration quenching occurs when the Eu³⁺ content was over 5 at. %. It was observed that the emission intensity strongly depends on the ratio of Y to Gd and the boron content. In terms of the luminescent intensity, the optimal Y/Gd ratio was 0.45/0.65 and using 120 ~ 135 % excess boron made it possible to improve the luminescence intensity of the (Y, Gd)Al₃(BO₃)₄/Eu³⁺ red phosphor. More details about the luminescence characteristics were studied.