RF 마그네트론 스퍼터링에 의한 $BaAl_2O_4$:Eu 박막의 광센싱 특성

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Light Sensing Characteristics of $BaAl_2O_4$ thin film by RF magnetron sputtering

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Abstract : Eu^{2+}, Nd^{3+} co-doped $BaAl_2O_4$ are known as a long afterglow phosphor. We found that Eu^{2+}-doped $BaAl_2O_4$ showed ptotoconductivity in the range of UV and visual light. In this study, $BaAl_2O_4$:Eu thin film has been prepared by RF sputtering method and a sensing characteristics to UV and visual light was performed. Only Eu^{2+} and Nd^{3+} co-doped $BaAl_2O_4$ powders and targets for deposition were prepared by a convention solid state method, and the deposition was performed in a reducing H_2-Ar mixture gas on Si substrates. The observation of crystalline phase and morphology of the sputtered film were performed using XRD, EDX. The photoluminescence and photocurrent to UV and visual light were measured simultaneously using 300W-Xe solar simulator as a light source. It was confirmed that the photocurrent induced by irradiation of light showed a linear relationship to the light intensity.

Key Words : $BaAl_2O_4$, phosphor, photoconductivity, thin film, RF sputtering