

Synthesis and Photoluminescence of the PDMS/SrAl₂O₄:Eu²⁺, Dy³⁺ Long-Persistent Luminescence Composite

이소라, 김형경, 김윤영, 정수환[†]

경북대학교

(shjeong@knu.ac.kr[†])

Long-persistent luminescence exhibit very long-lasting afterglow after sunlight or artificial light irradiation. ZnS, MAl₂O₄ (M=Sr, Ca, Ba), Y₂O₃ are representative phosphor. Among this luminescent materials, strontium aluminate have received much attention due to their high initial brightness, high quantum yield, long lasting time and good chemical stability. There are various method for synthesis phosphor such as sol-gel method, co-precipitation method, solid state reaction, etc. Electrospinning is one of the effective method to prepare one-dimensional hybrid materials. Electrospun nanofibers easily turn their size, morphology, composition.

Utilizing a conventional electrospinning technique, Eu²⁺, Dy³⁺ co-doped strontium aluminate, SrAl₂O₄:Eu²⁺, Dy³⁺ nanofibers were fabricated. Starting materials of Sr(NO₃)₂ and Al(NO₃)₃·9H₂O were mixed with Eu(NO₃)₃ as an activator, Dy(NO₃)₃ as a co-activator. PVP/inorganic hybrid nanofibers were annealed under reducing atmosphere for the reduction of Eu³⁺ to Eu²⁺. Long-persistent luminescence composite was fabricated using the phosphor samples and PDMS. PL intensity and afterglow time of PDMS/SrAl₂O₄:Eu²⁺, Dy³⁺ composite is investigated with variety of doping concentrations.