

유무기 hybrid matrix 에 In-situ 방법을 이용하여 제조된 Er^{3+} 이
 도핑된 ZnO 의 광학적 특성
 Optical properties of Er^{3+} doped ZnO prepared using in-situ method in
 inorganic/organic hybrid matrix

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In optical telecommunication systems, integrated optical devices were developed in order to reduce the size and cost of optical devices and have been fabricated by various techniques. The fabrication of integrated optical devices using hybrid materials has received increasing amount of attention. This technology proposes that the waveguides can be made by a simple ultraviolet (UV) light imprinting without chemical etching and no use of photoresist. However, it is well known that OH groups present in hybrid materials hinder the fluorescence phenomena. In the present work, we prepared Er^{3+} doped ZnO nanoparticles in inorganic/organic hybrid matrix by in-situ method, to improve the fluorescence by reducing Er^{3+} -clustering as well as minimizing the effect of residual OH group on Er^{3+} in hybrid materials. Methacryloxypropyltrimethoxysilane (MPTS) and zirconium propoxide [$\text{Zr}(\text{OPr})_4$] were used as the precursor of inorganic/organic hybrid matrix. For the formation of Er^{3+} doped ZnO nanoparticles, anhydrous zinc acetate [$\text{Zn}(\text{CH}_3\text{COO})_2$], dehydrated erbium acetate [$\text{Er}(\text{CH}_3\text{COO})_3$], and lithium hydroxide monohydrate ($\text{LiOH} \cdot \text{H}_2\text{O}$) were used. The fluorescence spectra of Er^{3+} doped ZnO/inorganic-organic hybrid matrix nanocomposites were investigated. And films were fabricated from the nanocomposites and characterized using prism coupler, SEM, AFM.