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SYNTHESIS AND LUMINESCENT PROPERTIES OF ZnO:Er³⁺

Zinc oxide (ZnO) is a material with multiple electrical and optical properties, in this work we studied the incorporation of the Er³⁺ ion into the host of ZnO synthesized by the Sol-Gel. Changes in the luminescent properties of ZnO:Er³⁺ are directly correlated with the incorporation of Er³⁺ ion (0.25, 1.25, 2.25, y 3.25 mol%). The Near-Infra Red (NIR) emission of ZnO:Er³⁺ was obtained excited at 980 nm with a pumping power around 370 mW, the maximum in the emission band at 1535 nm corresponding to $^4I_{13/2} \rightarrow ^4I_{15/2}$ transition of the Er³⁺. The Stark effect is appreciate in the NIR emission of ZnO:Er³⁺, the splitting of the intra-electronic levels of Er³⁺ is caused by the crystalline structure associated to the ZnO. Near-infra Red photoluminescence is useful for applications in optoelectronics and solar-cell technologies, for such purposes ZnO:Er³⁺ is very promising.

Keywords

Sol-gel, Near-infra Red photoluminescence, zinc oxide, erbium, crystalline structure.

Reference

Han, H.L. & Yang, Liwen & Liu, Y.X. & Zhang, Y.Y. & Yang, Q.B.. (2008). Up-conversion luminescence switching in Er³⁺-containing ZnO nanoparticles through Li⁺ co-doping. *Optical Materials*. 31. 338-341. 10.1016/j.optmat.2008.05.003.

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