World Academy of Science, Engineering and Technology
International Journal of Electronics and Communication Engineering
Vol:8, No:03, 2014

Study of the Nonlinear Optic Properties of Thin Films of Europium Doped Zinc Oxide

Authors : Ali Ballouch, Nourelhouda Choukri, Zouhair Soufiani, Mohamed El Jouad, Mohamed Addou

Abstract : For several years, significant research has been developed in the areas of applications of semiconductor wide bandgap such as ZnO in optoelectronics. This oxide has the advantage of having a large exciton energy (60 meV) three times higher than that of GaN (21 meV) or ZnS (20 meV). This energy makes zinc oxide resistant for laser irradiations and very interesting for the near UV-visible optic, as well as for studying physical microcavities. A high-energy direct gap at room temperature (Eg > 1 eV) which makes it a potential candidate for emitting devices in the near UV and visible. Our work is to study the nonlinear optical properties, mainly the nonlinear third-order susceptibility of europium doped Zinc oxide thin films. The samples were prepared by chemical vapor spray method (Spray), XRD, SEM technique, THG were used for characterization. In this context, the influence of europium doping on the nonlinear optical response of the Zinc oxide was investigated. The nonlinear third-order properties depend on the physico-chemical parameters (crystallinity, strain, and surface roughness), the nature and the level of doping, temperature.

Keywords : ZnO, characterization, non-linear optical properties, optoelectronics
Conference Title : ICPO 2014 : International Conference on Photonics and Optoelectronics
Conference Location : Madrid, Spain
Conference Dates : March 27-28, 2014