



Diagnostic study of the roughness surface effect of zirconium on the third-order nonlinear-optical properties of thin films based on zinc oxide nanomaterials

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Résumé en anglais	Zinc oxide (ZnO) and zirconium doped zinc oxide (ZnO:Zr) thin films were deposited by reactive chemical pulverization spray pyrolysis technique on heated glass substrates at 500 °C using zinc and zirconium chlorides as precursors. Effects of zirconium doping agent and surface roughness on the nonlinear optical properties were investigated in detail using atomic force microscopy (AFM) and third harmonic generation (THG) technique. The best value of nonlinear optical susceptibility $\chi(3)$ was obtained from the doped films with less roughness. A strong third order nonlinear optical susceptibility $\chi(3) = 20.12 \times 10^{-12}$ (esu) of the studied films was found for the 3% doped sample.
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