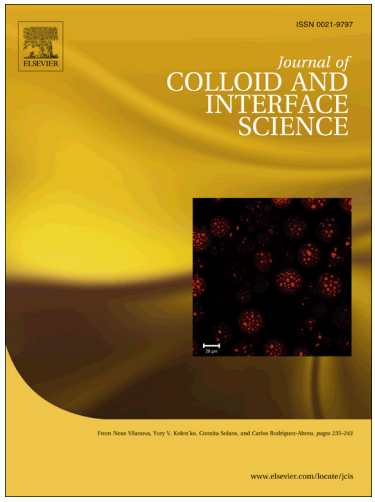


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# Role of deposition time on the properties of ZnO:$Tb^{3+}$ thin films prepared by pulsed laser deposition

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**Abstract**

Terbium ($Tb^{3+}$) doped zinc oxide (ZnO:$Tb^{3+}$) thin films were grown on silicon (100) substrates by the pulsed laser deposition technique at different deposition times that varied from 15 to 55 min. The effects of deposition time on the structural and optical properties of the ZnO:$Tb^{3+}$ films were investigated by X-ray diffraction, scanning electron microscopy and photoluminescence spectroscopy. As expected, the thickness of the ZnO:$Tb^{3+}$ film has increased with an increase in the deposition time. The photoluminescence intensity of the band to band emission has also increased with deposition time, while the deep level defect emission has decreased. The blue emission was observed from all the ZnO:$Tb^{3+}$ thin films deposited at the different deposition times excited by 325 nm He-Cd laser, while a green emission was observed when excited by 228 nm.

**Keywords:** ZnO:$Tb^{3+}$, Deposition time, Defects, Blue emission, PLD.

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