

Fabrication and characterization of pure ZnO thin films deposited by Sol – gel method

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Abstract : ZnO thin films were prepared via Sol-gel method and were deposited on an ordinary glass substrate using dip coating technique. These films undergo optical annealing using UV irradiation during 2 hours. The starting materials used were zinc acetate dehydrate, 2-methoxyethanol which was used as solvent as well as the mono-ethanolamine (MEA) as stabilizer. Xraydiffraction study shows that all the films prepared in this work have a preferential orientation situated at 34° and correspond to (002) plan of the hexagonal Wurtzite structure, with lattice constants $a = b = 3.02 \text{ \AA}$, $c = 5.20 \text{ \AA}$. The optical band gap energy of the thin films was found to be a direct allowed transition $\sim 3.23 \text{ eV}$. These values belong to the blue shift absorbance. Moreover, the photoluminescence measurement reveals that the prepared samples exhibit intense emission band in the visible and near UV. This observation led us to practical applications in the area of optoelectronic.

Keywords : Photoluminescence, band gap, ZnO, sol-gel method