Thematic area of your work (one of the thematic areas of International research and practice conference "Nanotechnology and nanomaterials")

Fabrication and characterization of magnesium doped Zinc Oxide thin films

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Semiconductor thin-film oxides are increasingly invading the world due to the extraordinary contribution they make and the possibility of using materials in nanometric dimensions. In this context, extensive research has been developed for the use of nanoscale semiconductors. In the form of thin layers, the latter allowed the integration of thousands of components, leading to the miniaturization of devices used in technological applications, such as light emitting diodes, laser devices and photovoltaic cells [1-3].

The present work consists of the development and characterization of magnesium doped ZnO thin layers (1, 3 and 5%). Samples elaborated were prepared using the sol gel method. The Mg-doped ZnO thin films were deposited on glass by the Dip-Coating technique. The drying temperature was set at 350 ° C and then we proceeded to determine where the optimal annealing temperatures reside using the calculation stress. The latter are all compressive with the exception of the 1% doped layer and annealed at 400 ° C where they are extensive. Minimum values for annealing temperatures of 500 ° C and 550 ° C were found.

The structural characterization of the ZnO thin films Mg-doped by X-ray diffraction has confirmed the formation of ZnO crystallites of nanometric size and hexagonal structure (wurtzite). The DRX has shown that the crystallites of ZnO have adopted a preferential orientation in the direction [002]. The AFM images have shown that the layers are of nanometric size. Raman spectroscopy has then confirmed the formation of ZnO of hexagonal structure (wurtzite).

Visible UV spectroscopy has mounted a shift of the absorption edge towards large energies.

1. *Umar A., Lee S., Lee Y. S., Nahm K.S., Hahn Y.B., J. Cryst. Growth -2005.-277, -P. 479.*
2. *Xiao Z. Y., Liu Y. C., Zha D. X. o, Zhang J. Y., Lu Y. M., Shen D. Z., Fan X. W., J. Lumin -2007.-122,-P. 822.*