

Poster Presentation

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Optical and structural characterization of antimony doped ZnO single crystal.

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We present the optical and structural study of the antimony doped zinc oxide (ZnO) performed by atomic diffusion. Diffusion is carried out at a temperature of 1000 ° C for periods of 1, 2 and 4 hrs from a solid source prepared by partial oxidation of antimony, characterizing each step of the process was performed by photoluminescence (PL) and x-ray diffraction (XRD). The characterization by photoluminescence shows the effect of doping with antimony in radiative transitions caused by the creation of impurity levels. Doped samples were analyzed by high resolution diffraction and reciprocal space mapping which revealed the structural modification of the quality of the single crystal produced by the introduction of antimony. The results indicate that the antimony is introduced fully the volume of ZnO and does not modify the quality of the crystal.

[1] Aoki, T. Shimizu, Y. Miyake, A. Nakamura, A. Nakanishi, Y. and Hatanaka, Y. (2002). *Phys. Status Solidi B* 229, 911-914., [2] Vaithianathan, V. Lee, B. T. and Kim, S. S. (2005). *Appl. Phys. Lett.* 86, 062101-062106., [3] Orman, R.G. Holland, D. (2007) *Journal of Solid State Chemistry*, 180, 2587-2592.

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