Preparation of Nitrogen doped ZnO thin films by colloidal route

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Zinc oxide is a material of great interest exhibiting pigmental, photocatalytic, piezoelectric, antibacterial, or varistor properties that have already been developed in many different fields of industry. Still novel applications emerge in various domains but they often require the preliminary stabilization of a p-type ZnO counterpart to the natural n-type ZnO to be stimulated. In optoelectronics for instance, the high optical transparency of ZnO thin films coupled with their high electrical conductivity and their strong room temperature luminescence could indeed open up the door to revolutionary technologies as transparent electrodes in solar cells and flat panel displays, light emitting diodes, lasers, etc. We have previously reported the stabilization of p-type nitrogen doped Zn1 xO nanoparticles (ZnO:N) obtained through the decomposition of zinc peroxide (ZnO_2) at low temperature under ammonia flow [1]. Our objective is now to extend these results to the realization of p-type ZnO thin films by colloidal route in order to achieve n-ZnO/p-ZnO:N homojonctions which would led to various applications in optoelectronics. The aim of the present work is to prepare nitrogen doped Zn1-xO thin film by thermal decomposition of ZnO_2 films obtained by chemical conversion of ZnO colloidal thin films.

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