



Electrical Characterization of ZnO thin films grown by molecular beam epitaxy

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Cuvillier Verlag Apr 2012, 2012. Taschenbuch. Book Condition: Neu. 211x149x4 mm. Neuware - For the electronic and optoelectronic device realization a precise control of the electrical properties in the utilized material is a very important issue. Doping profiles in realized p-n-junctions influence the functionality of the devices. The morphological and crystal properties of a device material directly influence the electrical ones. Dislocations present in a region of p-n-junctions can short circuit them leading to malfunctions. Too rough surfaces during epitaxial growth could lead to inhomogeneities in a single or multiple quantum wells and superlattices. The main goal of the present work was to provide the basis for a reliable p-type doping of ZnO grown by molecular beam epitaxy. Firstly, the well established heteroepitaxial growth on c-sapphire substrates has been employed. Based on the theoretical and experimental works, suggesting nitrogen to be the impurity that builds the most shallow acceptor level in ZnO comparing to other group-V elements, it has been implied as a dopant. To generate reactive nitrogen atoms an rf-plasma source has been utilized in the MBE process. The resulting samples have been characterized by such methods as AFM, XRD, TEM, PL spectroscopy, temperature domain Hall measurements (TDHM) and ECV-profiling....



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