

Structural Evolution of ZnO:Ga Thin Film on Profiled Substrate Grown by Radio Frequency Sputtering

J. H. Sun, J. H. Kim, B. G. Ahn, S. Y. Park, E. J. Jung, J. H. Lee, and H. C. Kang

Department of Advanced Materials Engineering and BK21 Education Center of Mould Technology for Advanced Materials and Parts, Chosun University, Gwangju, 501-759, Korea

Recently, Zinc oxide (ZnO) nano-structures have been received attractive attention because of their outstanding optical and electrical properties. It might be a promising material considered for applications to photonic and electronic devices such as ultraviolet light emitting diode, thin film transistor, and gas sensors. ZnO nano-structures can be typically synthesized by the VLS growth mode and self-assembly. In the VLS growth mode using various growth techniques, the noble metal catalysts such as Au and Sn were used. However, the growth of ZnO nano-structures on nano-crystalline Au seeds using radio frequency (RF) magnetron sputtering might be explained by the profile coating, i.e. the ZnO nano-structures were a morphological replica of Au seeds. Ga doped ZnO (ZnO:Ga) nano-structures using this concept were synthesized and characterized by XRD, AFM, SEM, and TEM. We found that surface morphology is drastically changed from initial islands to later sun-flower typed nano-structures. We will present the structural evolution of ZnO:Ga nano-structures with increasing the film thickness.

Keywords: ZnO