The Study of Defects in Oxide Semiconductor

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ABSTRACT

In this study, we investigated the ZnO film using Rrapid Thermal Chemical Vapor Deposition (RTCVD). The optical transmittance of the thin film can reach to average 80%. In Atomic Force Microscope (AFM), we can observed that some of the region were collapsed. The collapse was attributed to the pyrolysis effect or impurities falling on surface in the growth process. The (002) diffraction peaks of ZnO film were observed at 2θ = 34 ° in X-ray Diffraction (XRD). In Field Emission Scanning Electron Microscopy (FE-SEM) observation, the film thickness is about 59nm. TheThermally Stimulated Current (TSC) measurement indicates that the activation energy is about 75 meV. The decay rate is reduced with increasing temperature in the Persistent Photoconductivity (PPC) measurement. The result of PPC shows that the activation energy is 8 meV. The small activation energy indicates that the PPC effect isattributed to the surface roughness in this oxide semiconductor system.

Keywords : Zinc Oxide、Rrapid Thermal Chemical Vapor Deposition、Thermally Stimulated Current、Persistent Photoconductivity、Thin Film

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