

Effect of Annealing Process to ZnO Thin Films Deposited by Pulsed Laser Deposition

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ZnO is very attractive material for spintronics because of its high theoretical Curie-Temperature (~300K). Also ZnO can be applied to high-quality optical devices such as UV-light emitting sources or UV-sensing diodes because of its large exciton binding energy (~60meV). Moreover fields of transparent conducting oxides, solar cell, surface wave devices need ZnO. Recently there is enormous interests how to make ZnO thin films that have qualified structural, electrical and optical properties. For example, Materials used for spintronics such as diluted magnetic semiconductor based on ZnO need especially high quality crystalline because of acceptor and magnetic element doping.

In this study, ZnO films were grown by pulsed laser deposition (PLD) technique on sapphire (0001) substrates at various ambient gas conditions and annealing processes. And we compared multistep PLD method(1) with normal PLD method. We investigated the structural, optical and electrical properties by X-ray diffraction patterns, energy dispersive X-ray spectroscopy, photoluminescence spectroscopy, C-V measurement and deep level transient spectroscopy.

[참고문헌]

1. E. M. kaidashev et. al, Applied Physics Letters 82, 22 (2003)