

Influence of lithium dopant on Li doped ZnO Films

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Zinc oxide (ZnO) is an excellent piezoelectric material with simple structure and composition. ZnO film is applied to the piezoelectric devices because it has high resistivity and highly c-axis textured structure. Structural and electrical properties in ZnO films are influenced by deposition conditions. Lithium doped ZnO (LZO) films were deposited by RF magnetron sputtering method using Li-doped ZnO ceramic target with various ratio (0 wt.% LiCl dopant). LZO films revealed high resistivity of above $10^7 \Omega\text{cm}$ with smooth surface when they were deposited with 4% LiCl doped ZnO target under room temperature. However, their c-axis orientation was worse than one of pure ZnO films. We have also studied on structural, optical and electrical properties of the ZnO films by XRD, AFM, SEM, XPS, and 4-point-probe analyses. We concluded that amount of Li dopant increased and the c-axis orientation decreased, even though the electrical resistivity increased.