

Characteristics of n-type ZnO thin films fabricated under sub-milli torr working pressure

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Structural and electrical properties of n-type ZnO thin films fabricated by an inductively coupled plasma sputtering (ICPS) system were investigated. The n-type ZnO thin films were deposited on various substrates with under sub-milli torr working pressure. The X-ray diffraction (XRD) spectra shows that ZnO films have a preferentially c-axis [0002] orientation. Furthermore, The scanning electron microscopy (SEM) images show that as-grown ZnO thin films have hexagonal columnar shapes, such like hexagonal-rods. The I-V measurements show that crystalline of ZnO thin films becomes better as growth-temperature is increasing, and working-pressure is decreasing, especially under sub-milli torr.