

論文内容要旨

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学位論文題目	Fabrication of Transparent ITO/GTO Bilayer Thin Films using a Facing Target DC Magnetron Sputtering (対向ターゲット式DCマグネトロンスパッタ法を用いた透明ITO/GTO二層膜の作製)		
<p>内容要旨</p> <p>Due to the scarcity of Indium (In) in the future, efforts have been made to fabricate In-free semiconductors such as Ga-Sn-O (GTO) thin films via chemical vapour deposition, RF magnetron sputtering, and DC magnetron sputtering. However, an amorphous GTO fabricated by using DC magnetron sputtering is focused on a specific Ga:Sn ratio, and this opens avenues for further research using other Ga:Sn ratios. Hence, this study fabricated transparent diodes by layering a GTO thin film onto an In₂O₃:Sn (ITO) thin film using a facing targeted DC magnetron co-sputtering method. Ga:Sn ratio was adjusted by varying the current applied to the targets and the number of Ga₂O₃ pellets. Following that, the composition, phase, and optical transmittance of the GTO thin films were characterized. The current-voltage (I-V) characteristics of the fabricated ITO/GTO bilayer diode thin films were also determined. Results show that when a GTO film containing approximately 25 mol% Ga was deposited on the surface of the conductive ITO film at room temperature, a diode bilayer film was obtained. The bilayer film exhibited rectification characteristics of approximately 0 and 3.8 $\mu\text{A/V}$ when negative and positive voltages were applied, respectively. However, the rectification characteristics increased up to 68.3 $\mu\text{A/V}$ in the positive voltage region after annealing at 200 °C.</p>			