

Abstract Submitted  
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**Inductively Coupled Plasma Assisted Sputter-Deposition of Al-doped ZnO Thin Films<sup>1</sup>** YOSHINOBU MATSUDA, RYOTA SHINDO, AKINORI HIRASHIMA, MASANORI SHINOHARA, Nagasaki University — Tin-doped Indium oxide (ITO) has been mainly used as transparent conducting oxide films so far due to its high transmittance in the visible region, high chemical stability and low resistivity. For the last ten years, however, aluminum-doped zinc oxide (AZO) received attention as one of the alternatives to the ITO. In this work, deposition process of AZO thin films by ICP assisted sputtering was investigated in particular from the view point of influence of ICP RF power. The results obtained in this study can be summarized as follows. All the thin film characteristics (deposition rate, transmittance, resistivity, crystallinity) improve with increasing ICP RF power. Both the relative ratio of Al to Zn atom density in gas phase and the elemental ratio of Al in the deposited film increase with increasing ICP RF power. In addition, crystallinity of AZO film is promoted with increasing ICP RF power. We obtained good quality AZO film with resistivity of  $2 \times 10^{-3}$  ohm cm, transmission of more than 85% at deposition rate of 0.28nm/s at the working pressure of 30mTorr (Ar) with the target power of 40W and with ICP RF power of 300W.

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