

[T-12]

## Study of Anode Materials of Organic Electro-Luminescence devices

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Transparent conductive, undoped and aluminum-doped ZnO (AZO) thin films were prepared on the glass substrates at deposition temperature in the range of room temperature (R.T.) ~ 300 °C by RF magnetron sputtering. Highly oriented AZO films in the [002] direction were obtained with specifically designed ZnO targets. Systematic study on dependence of deposition parameters on structural, optical and electrical properties of the as-grown AZO films was mainly investigated in this work. The AZO film prepared at R.T. with 4 wt.% Al(OH)<sub>3</sub> doped ZnO target under target to substrate distance (Dts) of 45 mm has not only a high transmittance of 85% at the visible region but has also a resistivity of  $9.8 \times 10^{-2} \Omega\text{cm}$ . In addition the resistivity of AZO films increases with increasing Tsub. We investigated that all of tendency was changed before and after 4 wt.% doping. However, the resistivity of AZO film is higher than ITO film using organic electro-luminescence(EL) device, we tried to bring low the barrier between the devices as deposited AZO films on ITO substrates. We fabricated the organic EL structure consisted of Al as cathode, Al<sub>2</sub>O<sub>3</sub> as electro transport layer, Alq<sub>3</sub> as luminously layer, TPD as hole transport layer and AZO(1 nm)/ITO(150 nm) as anode. The result of this experiment was not good compared with the case of using ITO, Nevertheless, at this structure we obtained the lowest turn-on voltage as the value of 19 V and the good brightness (6200 cd/m<sup>2</sup>) of the emission light from the devices. Then the quantum efficiency was to be 1.0%.