

DC 마그네트론 스퍼터링 법으로 증착한 ZnO:Al 박막의 기판온도  
영향에 따른 특성 연구

**Influence of substrate temperature on the properties of Al doped ZnO(ZnO:Al)  
thin films deposited by direct current magnetron sputtering**

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A transparent conducting electrode is necessary component in most flat panel display (FPD) In most cases transparent conductive oxide (TCO) consists of a degenerate wide band gap semiconductor with low electrical resistivity and high transparency in the visible and near-infrared wavelength range. The commercially most important material for transparent conducting film nowadays is Sn-doped In<sub>2</sub>O<sub>3</sub> (ITO), owing to its unique characteristics of high visible transmittance ( $\leq 90\%$ ), low dc resistivity, high infra-red reflectance and absorbance in the microwave region. The high quality of ITO films deposited by sputtering of oxide targets has already been successfully achieved on a commercialized production scale.

Transparent conducting aluminum-doped zinc oxide (AZO) thin films have been deposited on Corning 1737 glass by DC magnetron sputter. The structural, electrical and optical properties of the films were investigated as a function of various substrate temperatures. AZO thin films were fabricated by dc magnetron sputtering with AZO ceramic target (Al<sub>2</sub>O<sub>3</sub> 2wt %).

The obtained films were polycrystalline with a hexagonal wurtzite structure and preferentially oriented in the (002) crystallographic direction. The lowest resistivity is  $6.0 \times 10^{-4} \Omega \text{cm}$  with the carrier concentration of  $2.694 \times 10^{20} \text{ cm}^{-3}$  and Hall mobility of  $20.426 \text{ cm}^2/\text{Vs}$ . The average transmittance in the visible range was above 90%. The more result will be presented in the meeting.