

DC 마그네트론 스퍼터링을 이용한 IZO 박막의 제조와 특성 연구  
Preparation and Characterization of IZO Thin Films grown by DC Magnetron Sputtering

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Indium zinc oxide (IZO) thin films were deposited on glass substrate by dc magnetron sputtering. The effects of oxygen flow rate and deposition temperature on electrical and optical properties of the films were investigated. With addition of small amount of oxygen gas, the characteristic properties of amorphous IZO films were improved and the specific resistivity was about  $4.8 \times 10^{-4} \Omega \cdot \text{cm}$ . Change of structural properties according to the deposition temperature was observed with XRD, SEM, and AFM. Films deposited above  $300^\circ \text{C}$  were found to be polycrystalline. Surface roughness of the films was increased due to the formation of grains on the surface. Electrical conductivity became deteriorated for polycrystalline IZO films. Consequently, high quality IZO films could be prepared by dc sputtering with  $\text{O}_2/\text{Ar} \approx 0.03$  and deposition temperature in range of  $150 \sim 200^\circ \text{C}$ ; a specific resistivity of  $3.4 \times 10^{-4} \Omega \cdot \text{cm}$ , an optical transmission over 90% at wavelength of 550 nm, and a rms value of surface roughness about 3 Å.