

펄스 레이저 방법으로 증착된 투명 산화물 전극용 인듐이
도핑된 ZnO:Al 박막

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**Indium doped ZnO:Al thin films prepared by pulsed laser deposition
for transparent conductive oxide electrode applications**

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Abstract : The different concentration Indium doped ZnO:Al films were grown on glass substrates (Corning 1737) at 200°C by pulsed laser deposition. The indium doping in AZO films shows the critical effect on the crystallinity, resistivity, and optical properties of the films. The AZO films doped with 0.3 atom % indium content exhibit the highest crystallinity, the lowest resistivity of $4.5 \times 10^{-4} \Omega\text{-cm}$, and the maximum transmittance of 93%. The resistivity of the indium doped-AZO films is strongly related with the crystallinity of the films. The carrier concentration in the indium doped-AZO films linearly increases with increasing indium concentration. The mobility of the AZO films with increasing indium concentration was reduced with an increase in carrier concentration and the decrease in mobility was attributed to the ionized impurity scattering mechanism. In an optical transmittance, the shift of the optical absorption edge to shorter wavelength strongly depends on the electronic carrier concentration in the films.

Key Words : AIZO, impurity scattering, transmittance, carrier concentration