

## TCO 응용을 위한 패턴된 기판위에 증착된 AZO 박막의 특성 연구

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### Conformal coating of Al-doped ZnO thin film on micro-column patterned substrate for TCO

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**Abstract** : Fabrications of antireflection structures on solar cell were investigated to trap the light and to improve quantum efficiency. Introductions of patterned substrate or textured layer for Si solar cell were performed to prevent reflectance and to increase the path length of incoming light. However, it is difficult to deposit conformally flat electrode on perpendicular plane.

ZnO is II-VI compound semiconductor and well-known wide band-gap material. It has similar electrical and optical properties as ITO, but it is nontoxic and stable.

In this study, Al-doped ZnO thin films are deposited as transparent electrode by atomic layer deposition method to coat on Si substrate with micro-scale structures. The deposited AZO layer is flatted on horizontal plane as well as perpendicular one with conformal 200 nm thickness. The carrier concentration, mobility and resistivity of deposited AZO thin film on glass substrate were measured  $1.4 \times 10^{20} \text{cm}^{-3}$ ,  $93.3 \text{cm}^2/\text{Vs}$ ,  $4.732 \times 10^{-4} \Omega \text{cm}$  with high transmittance over 80%. The AZO films were coated with polyimide and performed selective polyimide stripping on head of column by reactive ion etching to measure resistance along columns surface. Current between the micro-columns flows onto the perpendicular plane of deposited AZO film with low resistance.

**Key Words** : Al doped ZnO, TCO, conformal coating