

rf 마그네트론 스퍼터링법에 의해 증착한 Al 첨가된 ZnO 박막의 스퍼터링 타겟 밀도에 따른 물성의 의존성

DEPENDENCE OF PROPERTIES OF THE AL-DOPED ZNO THIN FILMS DEPOSITED BY RF MAGNTRON SPUTTER ON SPUTTERING TARGET DENSITY

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ZnO has been considered to be one of the most suitable alternative materials for transparent conducting electrode. Recently, the properties of Al-doped ZnO films prepared by sputtering method have been reported to have spatial nonuniformity.¹ Though it was proposed to be caused by high energetic oxygen bombardment², it's origin has not been systematically studied.

We investigated the properties of the Al-doped ZnO thin films sputtered using the Al₂O₃ added ZnO sintered target. The results showed target density was closely related with generation of high energetic oxygen species. In case of using higher density target, not only growth rate of thin films increased, but also spatial nonuniformity of properties was significantly reduced. Using 93% density target, we have successfully obtained the Al-doped ZnO transparent films having an uniform resistivity as low as $6.7 \times 10^{-4} \Omega\text{cm}$, at low sputtering pressure.

¹T. Minami, H. Sato, H. Imamoto and S. Takata, Jpn. J. Appl. Phys., **31**, L257 (1992)

²K. Tominaga, K. Kuroda and O. Tada, Jpn. J. Appl. Phys., **27**, 1176 (1988)