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마그네트론 co-sputtering 법을 이용한 ZnO:Al 박막의 저온 합성

The low temperature synthesis of Al doped ZnO films on glass & polymer using magnetron co-sputtering : working pressure and oxygen content effect

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Sputtering-deposited Al doped ZnO film is an attractive transparent conductive material for application in various electronic devices. Recently ZnO:Al film is widely used due to low cost and abundance in nature compared with ITO. In this work, we deposited on polymer substrates with many merits compared with those deposited on glass substrates in a point of being light, small, folded and easy to carry. Transparent conductive Al doped ZnO thin films were prepared on glass and polymer substrates by unipolar pulsed d.c. co-CFUBM (Closed Field Unbalanced Magnetron) sputtering at ZnO and Al targets at room temperature. In this paper, the influence of working pressure and oxygen content on electrical, chemical properties and film microstructure were investigated. The lowest resistivity of 1.2 mΩcm as well as the transmittance of above 84% were obtained by controlling working pressure and oxygen content. But the resistivity is slightly increased up to 6.8 mΩcm with time passing due to the unstable microstructure caused by low temperature.