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Effect of Substrate Temperature on Characteristics of IZTO and ITO Thin Films Deposited by Pulsed DC Magnetron Sputtering System

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IZTO and ITO thin films with a thickness of 200nm were deposited on Corning glass substrate to investigate the effects of substrate temperature on their electrical and optical properties by using pulsed DC magnetron sputtering with a sintered ceramic target of IZTO (In2O3 70 wt.%, ZnO 15 wt.%, SnO2 15 wt.%) and ITO (In2O3 90 wt.%, SnO2 10 wt.%). We investigated the structural, electrical, and optical properties of IZTO and ITO films. The structural and electrical properties of both films are sensitive on the substrate temperature. As the substrate temperature is increased, the electrical resistivity of ITO films is improved, but that of IZTO film increase over than 100°C. All IZTO and ITO thin films have good optical properties, which showed an average of transmittance over 80%. As a result, IZTO films can be a possible material for flexible display due to the low processing temperature.

Keywords: IZTO, pulsed DC magnetron sputtering, substrate temperature