

Enhancement of Surface Properties Using New Annealing Technique for ITO thin films

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ABSTRACT

Influence of new technique of 'oil thermal annealing (OTA)' on the nanostructured ITO coated films which improve adhesion strength, electrical conductivity and optical properties (transmittance) is revealed. The X-ray diffraction measurement (XRD) used to investigate the properties of nano structure films when the annealing temperature increases from 150 to 300°C. Surface characteristics of ITO films were investigated by different methods revealed the improvement in their surface properties due to oil thermal annealing treatment in comparison with as deposited films. Annealing is used to reduce inherent defects that may be introduced during the prepared thin film and cooling processes. The ITO film significantly presents a higher electrical conductivity of $38.6 \times 10^3 \Omega^{-1} \text{ cm}^{-1}$, as compared with as deposited films ($\sim 0.909 \times 10^3 \Omega^{-1} \text{ cm}^{-1}$). The proposed technique is useful in photonic device applications.

KEYWORDS: Oil thermal annealing, Surface morphology, ITO thin film, Nano layered

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