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Abstract

Nanomechanical properties of Indium Tin Oxide (ITO) thin films dip coated from precursor sols of varying equivalent oxide weight percentage (wt.%) onto commercial soda lime silica (SLS) glass substrate were evaluated by nanoindentation technique at an ultralow load of 50 μN. It was found that the increase in wt.% beyond 6 in the precursor sols, had an adverse effect on nanohardness and Young's modulus of the films. Moreover, relatively thicker triple layered film (about 240 nm) had inferior nanomechanical properties as compared to the single layered film. Interestingly, the ITO foam coating on SLS glass substrate had nanomechanical properties nearly as good as those of the single layered films. These observations are explained in terms of the relative differences in crystallinity, stiffness and elastic deformation ability of the films.

Keywords: Nanohardness, Young's modulus, Nanoindentation, ITO, Thin films, Sol, Dip-coating

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