Characterization of ITO Thin Films for the Application of Low Resistance Multilayer Transparent Electrode

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Indium Tin Oxide (ITO) films show low resistivity and high transmittance in the visible range of the spectrum, so they are playing an important role as the transparent electrodes in current displays and solar cells. For STN liquid crystal display high resolution and growing substrate sizes require improved transparent electrodes. ITO/Ag/ITO multilayer is one possibility to improve the sheet resistance for color filter electrode. The change in the surface morphology of ITO underlayers was found to differ the initial nucleation behavior of Ag films, so the sheet resistance of multilayer was changed. The experiment was carried out in RF magnetron sputtering system. ITO films with thickness $\leq$ 1000 Å was prepared for application ITO/Ag/ITO multilayer. The influence of the deposition parameters on the properties of ITO films was investigated and their growth behavior, micro-structure, preferred orientation were characterized.