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Bilayered Oxide thin films for transparent electrode application TITAS DUTTA, JAGDISH NARAYAN, NC State University — Ga doped ZnO films with electrical and optical properties comparable to indium tin oxide (ITO) is a promising candidate for transparent conducting oxides (TCOs) because of its superior stability in hydrogen environment, benign nature and relatively inexpensive supply. However, ZnO based TCO films suffer from low work function, which is a critical parameter for device applications. We report here the growth of a novel bilayered structure consisting of very thin (few monolayers) ITO,  $MoO_x$  layer on  $Zn_{0.95}Ga_{0.05}O$  film for transparent electrode applications by using pulsed laser deposition technique at different temperatures and oxygen partial pressure. The characteristics of the ITO film and the heterostructure have been investigated in detail using XRD, TEM, XPS, and electrical and optical property measurements. It is envisaged that the overall transmittance and the resistivity are dictated by the thicker layer of ZnGa<sub>0.05</sub>O beneath the ITO layer. Hence, this study is aimed to improve the surface characteristics without affecting the overall transmittance and sheet resistance. This will enhance the transport of the carriers across the heterojunction in the device, thus, resulting in the increase in device efficiency.

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