

Abstract Submitted
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Optical Properties of dual ion beam sputtered Indium Tin Oxide films on glass and Silicon NELSON SIMPSON, WILHELMUS GEERTS, ANUP BANDYOPADHYAY, Department of Physics, Texas State University — Indium Tin Oxide (ITO) is a transparent conducting material that finds application in flat panel displays, solar cells, and photodetectors. High quality ITO films, i.e. films with a large transparency and a high conductivity, are normally deposited above room temperature often at 300-400 C. This high deposition temperature eliminates most plastics as substrates. To lower the substrate deposition temperature we are applying atomic instead of molecular oxygen during the sputtering process. A dual ion beam sputtering system (DIBS) has been modified to allow the substrate to be exposed to an atomic oxygen beam at 45 degrees angle of incidence. Thin films were sputtered as a function of atomic oxygen flux and substrate temperature on glass, silicon, and sapphire substrates. The optical properties were measured by spectroscopic ellipsometry, reflectometry, and FTIR. Film thickness and bandgap were determined from the optical properties in the visible part of the spectrum. Mobility was determined from the infrared part of the spectrum. Optical properties appear to vary with the film thickness, the oxygen flux, and the substrate temperature. Roughness of the samples was independently measured by AFM. This work is supported by a grant from research corporation (10775).

Wilhelmus Geerts
Department of Physics, Texas State University

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