

Characteristics of IZO/Ag/IZO Multilayer Electrode Grown by Roll-to-roll Sputtering for Touch Screen Panel

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In this study, we investigated the electrical, optical, structural, and surface properties of indium zinc oxide (IZO)/Ag/IZO multilayer electrode grown by specially designed roll-to-roll sputtering system using the flexible substrate. By the continuous roll-to-roll sputtering of the bottom IZO, Ag, and top IZO layers at room temperature, they were able to fabricate a high quality IZO/Ag/IZO multilayer electrode. At optimized conditions, the bottom IZO layer (40 nm) was deposited on a flexible substrate. After deposition of the Bottom IZO layer, Ag layer was deposited onto the bottom IZO film as a function of DC power (200~500 W). Subsequently, the top IZO layer was deposited onto the Ag layer at identical deposition conditions to the bottom IZO layer (40 nm). We investigated the characteristics of IZO/Ag/IZO multilayer electrode as a function of Ag thickness. It was found that the electrical and optical properties of IZO/Ag/IZO multilayer electrode was mainly affected thickness of the Ag layer at optimized condition. In case of IZO/Ag/IZO multilayer electrode with the Ag power (350W), it exhibited a low sheet resistance of 7.1 ohm/square and a high transparency of 86.4%. Furthermore, we fabricated the touch screen panel using the IZO/Ag/IZO multilayer electrode, which demonstrate the possibility of the IZO/Ag/IZO multilayer electrode grown by roll-to-roll sputtering system as a transparent conducting layer in the touch screen panel.

Keywords: roll-to-roll, IZO/Ag/IZO, touch screen panel