

Top Emission OLED를 위한 ITO 박막 특성에 대한 연구

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A Study on the Characteristics of ITO Thin Film for Top Emission OLED

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Abstract

Organic light-emitting diodes (OLED) as pixels for flat panel displays are being actively pursued because of their relatively simple structure, high brightness, and self-emitting nature [1, 2]. The top-emitting diode structure is preferred because of their geometrical advantage allowing high pixel resolution [3]. To enhance the performance of TOLEDs, it is important to deposit transparent top cathode films, such as transparent conducting oxides (TCOs), which have high transparency as well as low resistance.

In this work, we report on investigation of the characteristics of an indium tin oxide (ITO) cathode electrode, which was deposited on organic films by using a radio-frequency magnetron sputtering method, for use in top-emitting organic light emitting diodes (TOLED). The cathode electrode composed of a very thin layer of Mg-Ag and an overlaying ITO film. The Mg-Ag reduces the contact resistivity and plasma damage to the underlying organic layer during the ITO sputtering process. Transfer length method (TLM) patterns were defined by the standard shadow mask for measuring specific contact resistances. The spacing between the TLM pads varied from 30 to 75 μm . The electrical properties of ITO as a function of the deposition and annealing conditions were investigated. The surface roughness as a function of the plasma conditions was determined by Atomic Force Microscopes (AFM).

Key Words : ITO, RF-sputtering, OLED

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Reference

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