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Abstract
The Organic Light Emitting Diode (OLED) was extensively studied due to its superior properties of low cost, simple structure, wide viewing angles and low power consumption etc. It has been praised as the mainstream of displays for next generation. The TFT-LCD will replace by the OLED display in the feature. However, the organic was sensitive to oxygen and moisture. So the short lifetime was the main problem that needs to solve. The SiOx or SiNx layer is used as a barrier layer for trapping the oxygen and water vapor permeated through SiOx or SiNx layer.
In this study, we deposited different kinds of the passivation layer. To measure their thickness, light-transported, density and water permeation. The film was applied on the OLED device, then encapsulation by using the glass cap and hygroscopic agent. The encapsulated OLED device compared the characters with the non-encapsulated OLED device, and measured their lifetime in the stable temperature and humidity. We discussed the relationship of voltage-current, voltage-luminance, time-luminance, cathode morphology and dark spots. The result of the experiment has showed that the lifetime of the OLED device could be increased via effective encapsulation.
Advisory Committee Wen Ray Chen - advisor

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