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Abstract
There are many factors influencing the lifetime of OLED. An understanding of the degradation process is still far from being complete, but a lot of research work showed the moisture and oxygen play an important role in the degradation processes. The presence of moisture and oxygen causes cathode oxidation, cathode delamination and induces the formation of organic crystalline structure.

In this work, we have two main discussions:

(1) Try to find the most suitable passivation, cap and getter materials for OLED devices, respectively.

(2) Using the optimal encapsulation to understand how the encapsulation effect OLED device lifetime.

First, the most suitable encapsulation materials for OLED were surveyed by various testing procedures, and then OLED devices with varied level encapsulations had been made to compare the characteristics with non-encapsulated OLED. After reliability test, discuss the relationship of voltage-current, voltage-luminance, time-luminance, dark spots and cathode morphology. The results of the experiments showed that the lifetime of OLED can be significantly improved via effective encapsulation.
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