Fabrication and Optoelectronic Properties of CuPc/Alq3 Organic Light Emitting Devices

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ABSTRACT

In this thesis, the organic light-emitting devices (OLED) were fabricated on indium tin oxide (ITO) conductive glass. The organic materials, copper phthalocyanine (CuPc) and tris-(8-hydroxyquinoline) aluminum (Alq3) were growth by thermal evaporation under 10?5 torr pressure. The influence of thickness of CuPc and Alq3 on the luminous efficiency of OLED with CuPc/Alq3 double layers structure was investigated. Furthermore, the efficiency of OLED is related to the resistance of the device. Consequently, the contact resistance between different metal electrode and ITO was measured, and then got the circumstantial evidence about the variation of work function of ITO after oxygen plasma treatment. From the results of I-V characteristic curves, the OLEDs with 300 A CuPc and 400 A or 600 A Alq3 have the lowest threshold voltage, around 5 V to 6 V. The contact resistivity is lower between ITO and gold, and reduces lower after oxygen plasma treatment. Obviously, gold is the better choice for contact electrode with ITO.

Keywords : organic light-emitting devices ; copper phthalocyanine (CuPc) ; tris-(8-hydroxyquinoline) aluminum (Alq3)

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