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Abstract
The main advantage of PLED beyond other large flat panel displays (FPD) is their ease of fabrication because the polymer solutions can be used spin-coating method. In order to satisfy the requirements, which are quite durable, light and thin on the flat display, it is essential technology for flexible polymer light-emitting diodes (FPLED) such as etching process of indium-tin oxide (ITO) on polyethylene terephtalate (PET). Indium tin oxide (90 wt.% In2O3; 10 wt.% SnO2; ITO) thin films used for the fabrication of display devices are required high optical transmittance and excellent electrical conductivity. In this study, wet etching behavior of indium-tin oxide (ITO) on flexible substrates is performed so that the FPLED could be formed for the passive matrix. The HCl is used as etching solution. Consequently, the surface roughness of the ITO films at different etching processes are measured by the AFM. The values of Ra is 0.32235, 0.15203 and 1.32398 nm for concentration ratio of 1:1, 1:2, 1:3, respectively. It is obtained that the excellent etching parameter and sheet resistance of ITO film by CR= 1:2 at room temperature. In this article, we demonstrate the good pattern for PLED can be obtained.

We report that a electron transport layer of Alq3 interposed between a cathode of Al and an emissive layer can significantly improve electroluminescence efficiency in an organic-polymer light emitting diode (OPLED). The difference of the turn-on voltage is about 6V for with and without insertion of a thin Alq3 layer. The turn-on voltage of luminescence with Alq3 defined by 491cd/m2 is 5.1V. The emission area is 1.5×0.3cm2. With the initial luminance of 937cd/m2（at 8V）, the half-lifetime of the device without the Alq3 was 30 min, but that of the device with Alq3 was 90 min. Interfacial characteristics of PF/Al and PF/Alq3/Al were investigated the results were used to explain the difference in device performance.
Advisory Committee C. J. Huang - advisor

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