

# Fabrication of Organic Light Emitting Diode on Aramid Paper Substrate

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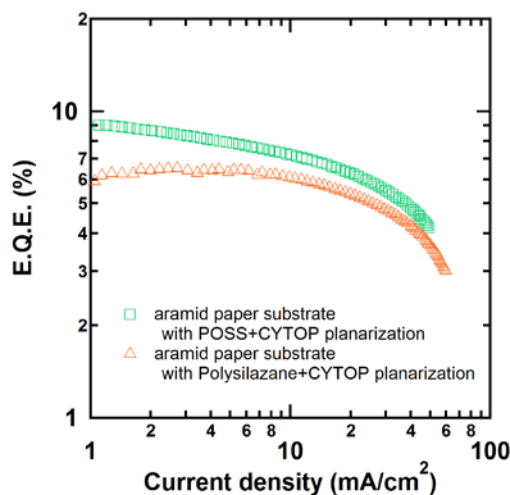
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Organic light-emitting diodes (OLEDs) have attracted great attention due to their various applications such as solid-state general lighting, large-area display and flexible & transparent displays. Nowadays applications for low-cost disposable, throwaway displays also draw attention for next generation display technology. [1] However, surface roughness issues should be compensated preferentially for direct fabrication of electronics on paper substrate. [2] Herein, we demonstrate bright top-emission organic light-emitting diodes (TE-OLEDs) on flattened flexible aramid paper substrate.

We fabricated green phosphorescent non-inverted top emission OLED device on paper substrate after surface smoothing process: UV curing process of methacryl POSS or spin-coating process of polysilazane was introduced for the first planarization layer. Furthermore, we employed additional spin-coating of CYTOP for obtaining smoother surface. Because of high thermal resistance of aramid, annealing process could be implemented on paper substrate. As a result, surface roughness decreased drastically and device fabricated on POSS and CYTOP planarization process shows much improved performance in terms of driving voltage and external quantum efficiency. (Fig.1). These simple surface smoothing processes could bring us to open new door for next generation electronics, “disposable and flexible devices”, with low-cost.



**Fig. 1. External Quantum Efficiency of green phosphorescence OLED device on aramid paper substrate with different planarization method**

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