The device characteristics of Alq_3 based OELDs between direct current and alternating current driving

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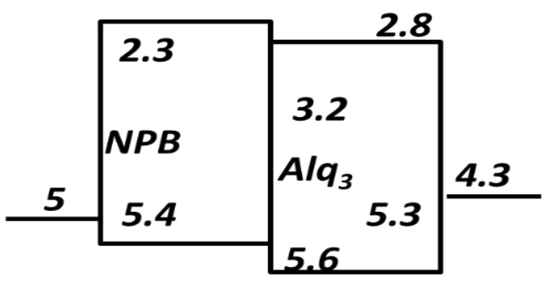
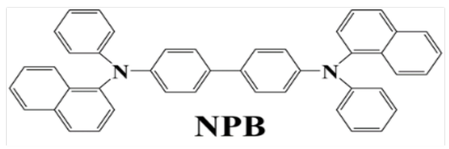
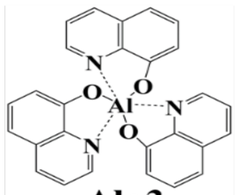
Abstract

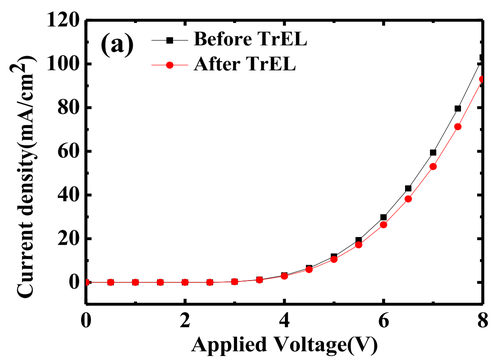
In this works, we fabricated a green OLEDs based on Alq_3 and found that the luminance and current density response of OLEDs was varying as the duty cycle varying. As high duty cycle, the high luminance and current density was obtained. Such phenomenon maybe comes from trapped charge effect.

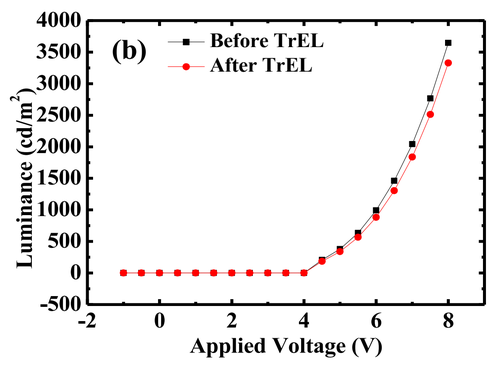
➢ Energy diagram and molecule structure

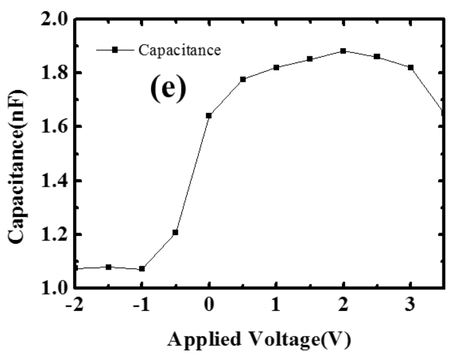


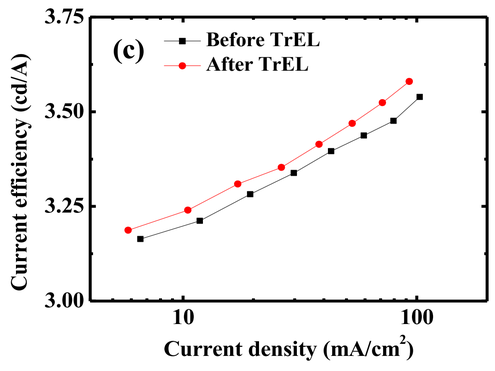


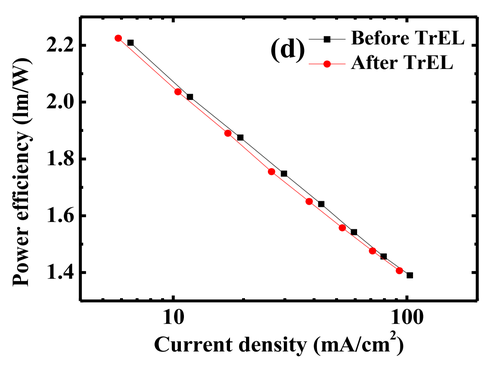






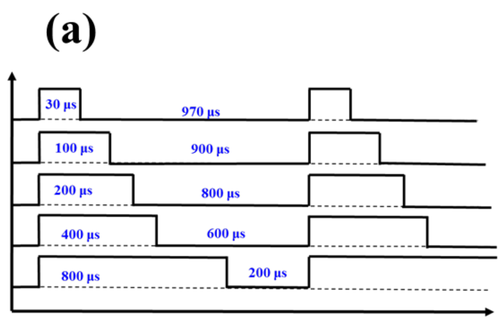


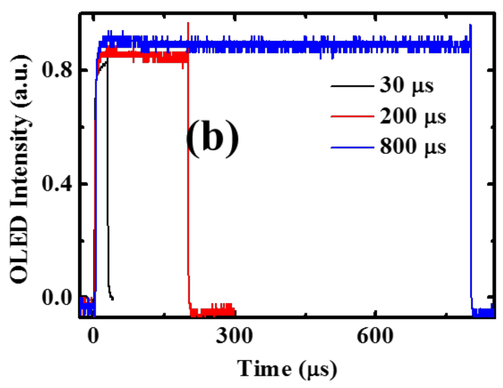


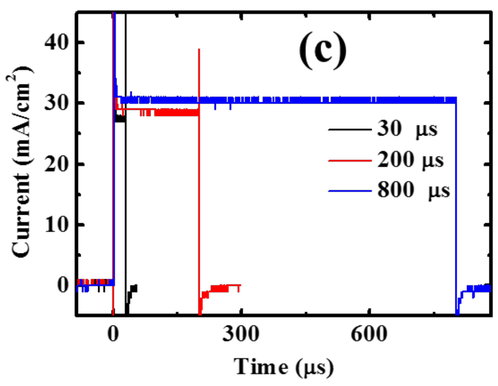


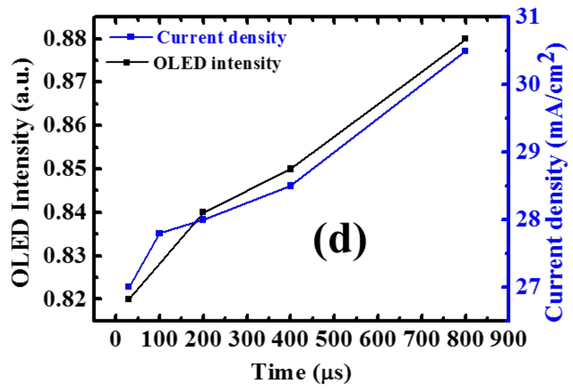
➢ The BIV performance before and after TrEL and CV curve.

➢ Similar performance before and after experiment









(a) Schematic diagram of the waveforms with 6 V/ 0 V and 1 kHz repetition rate under different pulse width (30 μs to 800 μs), (b) transient luminance responses, (c) transient current density responses and (d) OLED intensity and current density with different pulse width driving.

- One interesting thing, the increase of OLED intensity is together with the increase of current density.
- Trapped charge effect.

➢ Summary

In summary, we fabricated a green OLEDs based on Alq_3, and treat the device with transient electroluminescence. Besides, we also found that the luminance and current density response of OLEDs was varying as the duty cycle varying. As high duty cycle was applied, the high luminance and current density was obtained. Such phenomenon maybe comes from trapped charge effect. Hence, the device performance is different under the AC and DC driving.