

New copolymer used in PLEDs devices with ITO treated by UV-Ozone reactor with modified mercury HID lamp

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Abstract - In this work, a copolymer was synthesized having main objective the including of electron-hole carriers in its composition improving the efficiency of PLEDs devices. This copolymer was also mixed with another polymer as PVK revealing significant differences on devices performance. First, PEDOT:PSS polymeric layer was deposited on ITO treated by UV-Ozone reactor with low cost using a modified mercury vapor lamp HID type, reflector, fans, wooden base and ballast. During experiments an untreated sample was used as reference in the analysis and assembly of PLEDs. In $I \times V$ curves was revealed that the samples treated presented low threshold voltage.

Table 1: Devices assembled with copolymer and copolymer mixed by PVK with voltage operation, current and luminance results presented of PLEDs devices.

Architecture of Device	Voltage Operation (V)	Current (mA)	Luminance (cd/m ²)
Copolymer	29	6.3	0.85
Copolymer mixed with PVK (10% in mass)	36	1.6	0.26

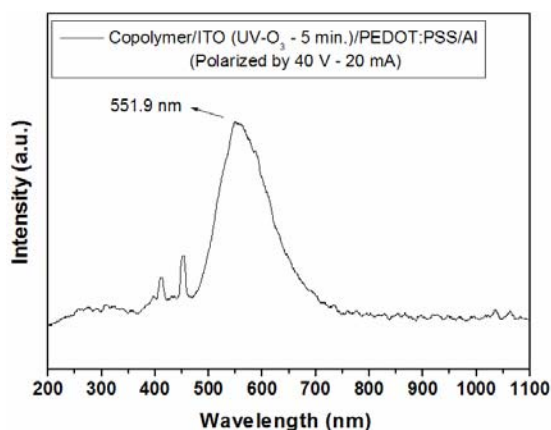


Figure 1: Intensity vs. wavelength for device using copolymer treated by 5 minutes of UV-Ozone.

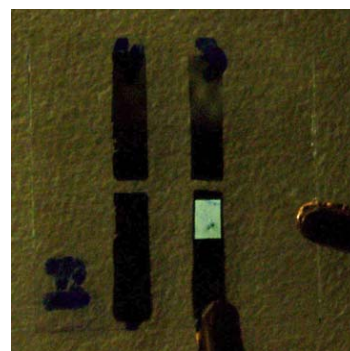


Figure 2: Green-light shine emitted by PLED device using copolymer and ITO treated by 5 minutes of UV-Ozone.

References

- [1] E. R. Santos, F. C. Correia, E. C. B. Junior, S. H. Wang, M. A. Yamasoe, P. Hidalgo, F. J. Fonseca, A. M. Andrade, *Sensors & Transducers Journal* 101, (2009) 12-21.
- [2] E. R. Santos, E. C. B. Junior, F. J. Fonseca, A. M. Andrade, Treatment of UV-Ozone on Indium Tin Oxide films using HID Lamp for Assembly of Polymer Light Emitting Diodes Devices, 4th International Symposium on Advanced Materials and Nanostructures, Santo Andre, SP, Brazil, 17-19 May, 2009, 13p.
- [3] E. R. Santos, F. C. Correia, S. H. Wang, E. C. B. Junior, M. A. Yamasoe, P. Hidalgo, F. J. Fonseca, A. M. Andrade, International Conference on Organic Electronics, Liverpool, England, 15-17 June, 2009, poster presentation.