

# Tuning colors in novel electroluminescent devices based on Al-indandionate complexes

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In the past years, the development of materials for organic light-emitting diodes (OLEDs) have attracted much attentions [1]. In this sense, the present work reports about syntheses, characterization, Photo (PL) - and electroluminescence (EL) properties of Al-indandionate complexes of formula  $[\text{Al}(\text{aind})_3]$ , where aind: 2-acetyl-1,3-indandionate (acind), 2-benzoyl-1,3-indandionate (bind) or 2-(4-methyl)benzoyl-1,3-indandionate (mbind). These complexes were characterized by elemental analyses, Fourier-infrared absorption spectroscopy, thermogravimetric analyses and <sup>1</sup>H-NMR. Photoluminescent spectra of the complexes in both powder and thin film exhibited overlapped broad bands associated to both fluorescence and phosphorescence (see time-resolved spectra, Fig. 1a) phenomena. The electroluminescent devices of configuration ITO/ $\beta$ -NPB/ $\text{Al}(\text{aind})_3/\text{LiF}/\text{Al}$  (1) exhibited emission in the red spectral region associated to electrophosphorescence (figure 1.b). On the other hand, the three layers devices of configuration ITO/ $\beta$ -NPB/spiro-2CBP/ $\text{Al}(\text{aind})_3/\text{Al}$  (2) showed an intensity band in green spectral region (figure 1.b). The OLEDs presented emission from low voltage (~8V), reaching the highest intensity around 16 V. According to these results, the Al-indandionate complexes act as both efficient electron transporters and emitting layers. In addition, these data suggest that TADF process is operative in the bilayer devices.

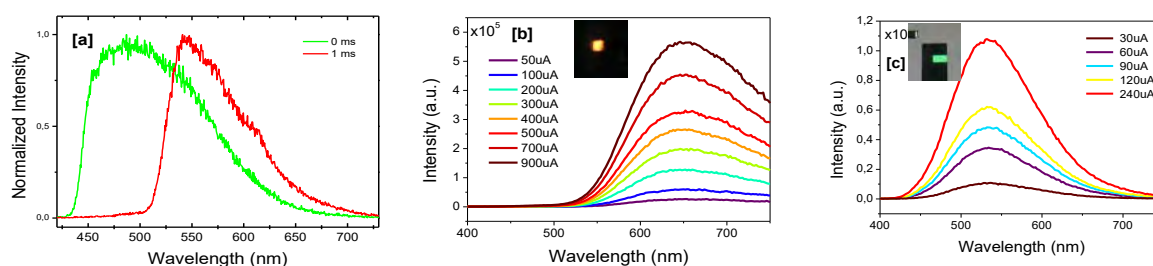


Fig. 1. Photo - and electroluminescence spectra of complex  $\text{Al}(\text{acind})_3$ : (a) PL time-resolved spectra (b and c) EL spectra of the ITO/NPB/ $[\text{Al}(\text{acind})_3]/\text{LiF}/\text{Al}$  and ITO/NPB/spiro-2CBP/ $\text{Al}(\text{aind})_3/\text{Al}$  devices.

Keywords: Electroluminescence, Al-Indandionate complexes, Tuning emitting colors.

## Acknowledgements

This work was supported by CNPq, CAPES and inct-INAMI.

## References

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