Solution-processable Blue-Greenish Hybrid Polymeric/Perovskite Quantum Dots Light Emitting Diodes

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Abstract
In this present research the applicability of quantum dot (CsPbBr3 perovskite) and polymer nanocomposites in LED were studied. Photophysical properties of the materials and the final hybrid LED were reached. The purpose of this material combination is the desirable properties mix of both.

Key words: Perovskites, polymers, HLEDs

Introduction
Currently the organic electronic is growing, especially in light emitting diodes. This kind of material can be casted in flexible substrates.1 The main problems in organic LEDs are low efficiency compared with inorganic ones. This failure can be avoided by adding inorganic materials with good luminescence, and preserving the processability in flexible substrates.
In this scenario a new material aroused with promising properties.2 The Cesium Lead Halide perovskites (CsPbX3) have emission that depend on the halide (X), varying from the blue (chlorine) to red (lode). This material can be processed in solution with a polymer to be casted in a substrate. In this current research was combined a polymer with CsPbBr3 (green perovskite) in solution casted in films on a substrate to manufacture the devices.

Results and Discussion
It was fulfilled the photophysical measurements of different film conformation, all including a nanocomposite of quantum dots and polymer. At first the films were casted with quantum dots and Poly(9-vinylcarbazole) (PVK). The absorbance in both CsPbBr3 and PVK films are showed as peaks near of 290nm, more intensely in the perovskite one. Films with the nanocomposite have intermediate absorbance between QD and polymer. Making use of this data, the films were excited at 290nm and the fluorescence spectra were obtained.

Conclusions
The HLEDs achieved in this research cannot be used in a emission of monochromatic light. The present HLEDs show a combination of blue and green emission that combined with a red emitting material can show a white emission.

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