Diploma thesis abstract

Luminescent properties of oligothiophene-phenylenes crystalline films

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Oligotiophene-phenylenes show promising properties for organic optoelectronics . In this work, we study the luminescent properties of crystalline films of two new materials (RN29 and MAF377) to evaluate their potential for organic optoelectronics.

The experimental method for measurement of the external photoluminescence quantum yield (PL EQY) has been implemented. The PL EQY of crystalline films have been measured. The PL EQY of RN29 crystalline films can reach (79 ± 7)% and that of MAF377 crystalline films can reach (39 ± 3)%. These values are one of the highest for crystalline samples of organic materials which luminesce in the visible spectrum.

The spectral-temporal dynamics of the photoluminescence of the crystalline films have been studied. The effect of PL reabsorption and pump polarization on the spectrum and temporal dynamics of the PL has been studied. It is shown that the MAF377 PL decay time strongly depends on the PL wavelength (475nm - 80ps, 520nm - 1300ps).

The OTF studied show great potential for their use in organic optoelectronics because of the large external PL quantum efficiency.