

Luminescence properties of poly- (phenylene vinylene) derivatives

**Ton-That Cuong, Stockton Geoff, Phillips Matthew R.,
Nguyen Thien-Phap, Huang Chun Hao, Cojocaru, Ala**

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Abstract

Background: Conjugated polymers, especially those of the poly(phenylene vinylene) (PPV) family, are promising candidates as emission material in light-emitting devices. The aim of this work was to investigate the dependence of the luminescence properties of PPV-based derivatives on their polymer structure, especially side groups.

Results: Three PPV derivatives, BEHPPV, MEHPPV and MEHSPPV, were synthesised and characterised by photoluminescence (PL) and cathodoluminescence (CL) spectroscopies in the temperature range 10–300 K. PL and CL spectra of the polymers exhibit similar luminescence peaks, which undergo a blue shift with increasing temperature. The shift in wavelength is accompanied by variations in the relative intensities of emission peaks. Both BEHPPV and MEHPPV display emission characteristics of the PPV backbone, but the peak of MEHPPV shifts to a longer wavelength in comparison with the corresponding peak of BEHPPV at the same temperature. The luminescence spectra of MEHSPPV, which has a sulfanyl incorporated in the side chain, are considerably different from those of the two other derivatives.

Conclusions: The results demonstrate that the luminescence properties depend strongly on the chain conformations of the conjugated backbone, which are affected by polymer side chains.

Keywords: *conjugated polymers, polymers, light-emitting devices, emission materials, luminescence*

Citing Literature

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