

## Fluorescence and Recombination of Charge Carriers in PPPV\*

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### *PPPV | Delayed fluorescence | Magnetic field effect | Geminate electron-hole pair*

The investigation of the magnetic field effect (mfe) of the intensity of fluorescence excited in thin films of poly(2-phenyl-1,4-phenylene vinylene) (PPPV) leads to the conclusion that the delayed part (being only sensitive to an applied magnetic field) is due to geminate recombination of charge carriers. The temperature dependence of the magnetic field effect has permitted the estimate of the difference between the energy levels of the excited fluorescing state and the geminate electron-hole pair. The fitting of the experimental curve yielded  $\Delta E = 0.05$  eV.

Die Untersuchung von Magnetfeldeffekten (MFE) der Lumineszenzintensität dünner Poly(2-Phenyl-1,4-Phenylvinyl) (PPPV)-Filme führte zu der Schlußfolgerung, daß der verzögerte Teil der Fluoreszenz (prompte Fluoreszenz ist nicht magnetfeldsensitiv) durch geminale Ladungsträgerrekombination hervorgerufen wird. Aus der Temperaturabhängigkeit des MFE konnte die Differenz zwischen den Energieniveaus des angeregten fluoreszierenden Zustandes und des geminalen Elektron-Loch-Paares bestimmt werden. Die experimentellen Daten lieferten einen Wert von  $\Delta E = 0.05$  eV.

### 1. Introduction

Recent investigations of poly(1,4-phenylene vinylene) (PPV) and its phenyl substituted derivatives suggest that the transformation of the excitation energy can be envisioned to occur in the following way [1–5]: Excitation

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