



Solid state fluorescence of push-pull distyrylbenzenes

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Introduction

It is known that majority of materials based on organic conjugated molecules that exhibit efficient solid-state fluorescence (SSF) emit in blue/green region. The goal of this work was to study an influence of different substituents on optical properties with focus on SSF in the red region. A series of potential fluorophores based on bulky diphenyl-distyrylbenzene (DP-DSB) core substituted with diphenylamine (DPA) as electron donor and various electron acceptor moieties with variable electron-withdrawing strength was synthesized and their fluorescence was characterized.

Materials and Methods

A series of prepared fluorophores is shown in (Figure 1). Their absorption and fluorescence was studied in solvents with various dielectric constants and in solid state. Fluorescence life-times were measured using TCSPC method.

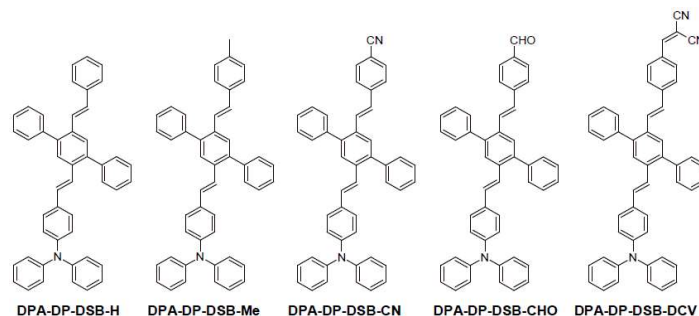


Figure 1 The studied DPA-DP-DSB derivatives.

Results and Discussion

All five compounds show a remarkable solid-state fluorescence covering the range from blue over green to red. Strong electron-acceptor moieties can shift the emission toward longer wavelengths as can be seen in (Figure 2). The bulky diphenyl-distyrylbenzene core prevented the fluorescence quenching in solid state.

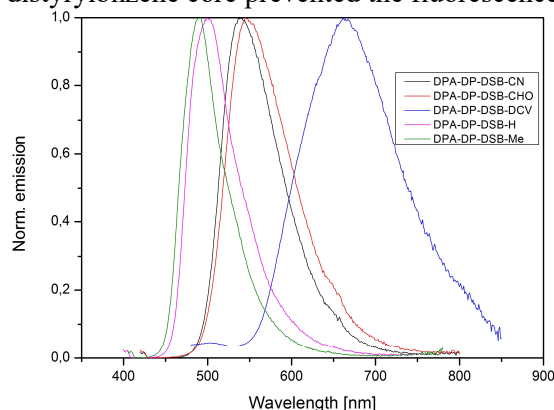


Figure 2 Solid state fluorescence spectra of the studied derivatives.

Acknowledgement

This work was supported by Czech Science Foundation via project No. GA 17-21105S, research infrastructure was supported by project MŠMT No. LO1211. from the National Programme for Sustainability I (MEYS CR)