Supporting Information

High brightness deep blue / violet fluorescent polymer light-emitting diodes (PLEDs)

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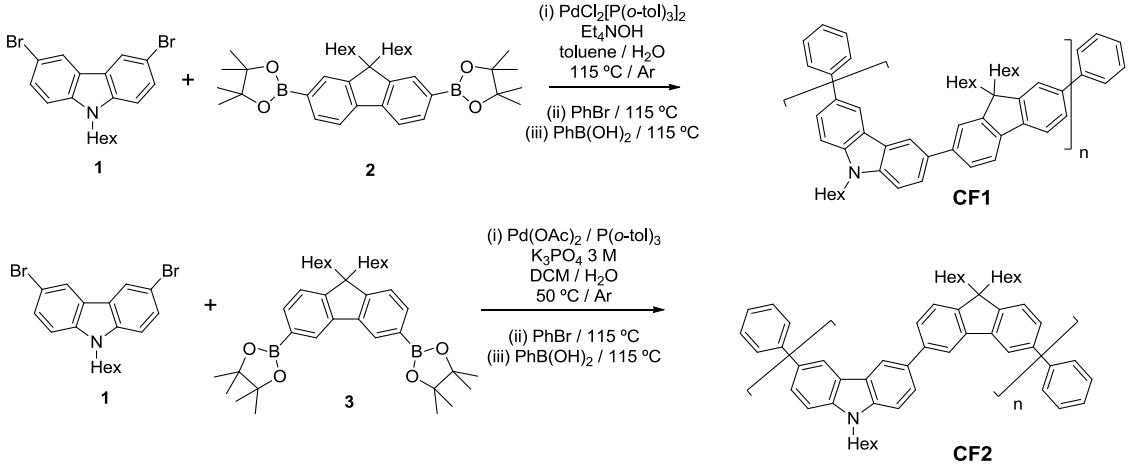
Synthesis

Materials and Characterisation: Materials obtained from commercial suppliers were used without further purification. Solvents were dried and degassed following standard procedures. Monomers **1**[1], **2**[2] and **3**[3] were obtained according to previously reported procedures.



Scheme S1. Synthesis and structures of co-polymers **CF1** and **CF2**.

Co-polymer synthesis: General procedure: The co-polymers **CF1** and **CF2** were prepared following Suzuki-Miyaura cross-coupling conditions. After the reaction was complete, both co-polymers were end-capped with phenyl units by addition of bromobenzene (0.1 mL), followed 1 h later by benzeneboronic acid (100 mg). The reaction mixture was cooled and poured into methanol (300 mL). The resulting precipitate was filtered and sequentially washed with methanol, water and methanol.

After drying, the solid was redissolved in chloroform (20 mL) and a solution of palladium scavenger (1 g of sodium diethyldithiocarbamate trihydrate) in water (20 mL) was added. The mixture was then stirred overnight at 60 °C. The organic layer was separated and sequentially washed with dilute HCl (5%), concentrated sodium acetate and water. The resulting organic extracts were filtered through a plug of celite and concentrated under vacuum. The concentrate was added dropwise to methanol to precipitate the co-polymers which were isolated as white solids and characterised by GPC-UV-Vis using polystyrene standards.

Synthesis of CF1: Monomers **1** (139 mg, 0.341 mmol) and **2** (200 mg, 0.341 mmol) were dissolved in toluene (7 mL) and degassed by bubbling argon into the solution for 30 min, then $PdCl_2[P(o\text{-tol})_3]_2$ (8 mg, 1% mol Pd/Br) was added and reaction degassed for additional 15 min. A degassed aqueous Et_4NOH solution (4 mL, 20% w/w) was added and reaction mixture was stirred at 115 °C for 24 h. M_w 31,000 Da, M_n 10,800 Da.

Synthesis of CF2: Monomers **1** (209 mg, 0.512 mmol) and **3** (294 mg, 0.512 mmol) were dissolved in DCM (6 mL) and degassed by bubbling argon into the solution for 30 min, then $Pd(OAc)_2$ (4.5 mg, 1% mol Pd/Br) and $P(o\text{-tol})_3$ (12 mg, 2% mol) were added and reaction degassed for additional 15 min. A degassed K_3PO_4 3 M solution (5 mL) was added and reaction mixture was stirred at 50 °C for 24 h. M_w 21,000 Da, M_n 6,051 Da.

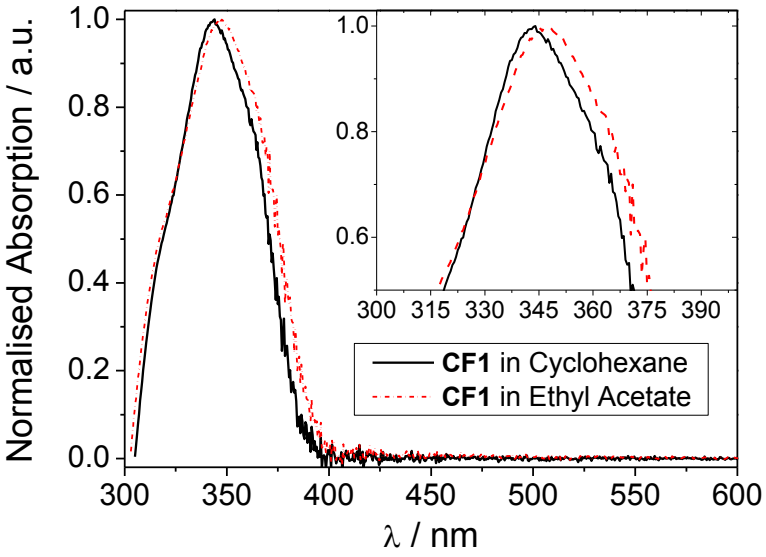


Fig. S1. Absorption spectra of polymer **CF1**.

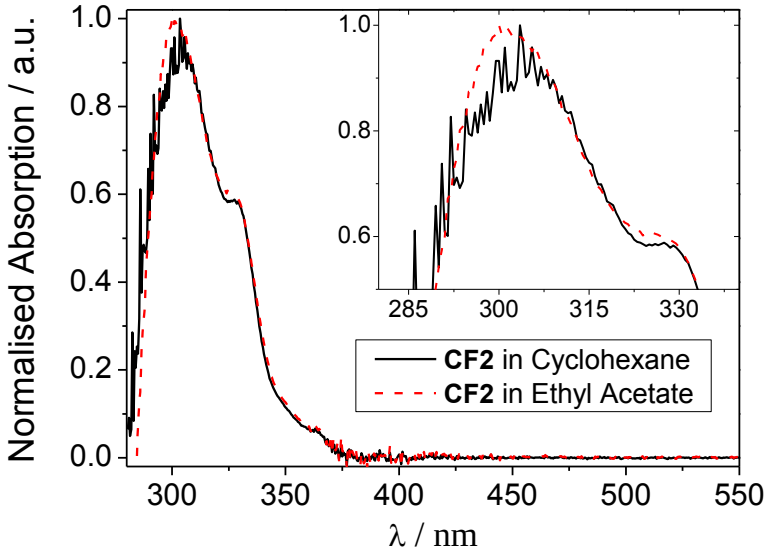


Fig. S2. Absorption spectra of polymer **CF2**.

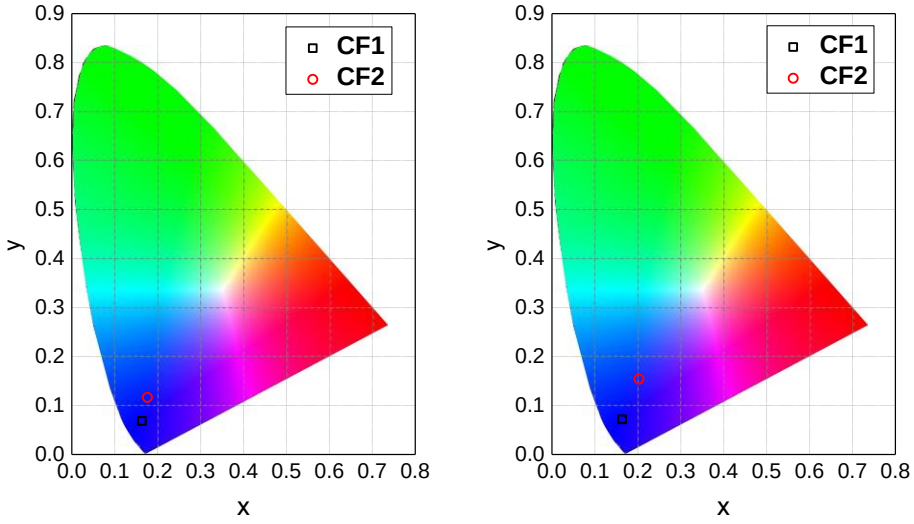


Fig. S3. CIE diagrams for **CF1** and **CF2** devices at the turn-on voltage (10 cd m^{-2}) (left) and at the maximum brightness (right). Device architecture: ITO/PEDOT:PSS/polymer/TPBi/LiF/Al.

1 K. R. J. Thomas, J. T. Lin, Y.-T. Tao, and C.-W. Ko, *J. Am. Chem. Soc.*, 2001, **123**, 9404–9411.

2 S. P. Dudek, M. Pouderoijen, R. Abbel, A. P. H. J. Schenning, and E. W. Meijer, *J. Am. Chem. Soc.*, 2005, **127**, 11763–11768.

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