Supporting Information

Synthesis, Photo- and Electroluminescence of New Polyfluorene Copolymers Containing Dicyanostilbene and 9,10-Dicyanophenanthrene in the Main Chain

Anton A. Yakimanskiy [1], Ksenia I. Kaskevich [1], Elena V. Zhukova [1], Ivan A. Berezin [1], Larisa S. Litvinova [1], Tatiana G. Chulkova [1], Dmitriy A. Lypenko [2], Artem V. Dmitriev [2], Sergey I. Pozin [2], Natalia V. Nekrasova [2], Felix N. Tomilin [3,4], Daria A. Ivanova [4] and Alexander V. Yakimansky [1,*]

[1] Institute of Macromolecular Compounds RAS, Bolshoi Prospect of Vasilyevsky Island 31, St. Petersburg 199004, Russia; yakimanskii@gmail.com (A.A.Y.); kaskevich-ksenia@yandex.ru (K.I.K.); zukovaev@mail.ru (E.V.Z.); bereziv@mail.ru (I.A.B.); larissa_litvinova@hotmail.com (L.S.L.); tgc@mail.ru (T.G.C.)

[2] A.N. Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Leninskiy Prospect 31, bld.4, Moscow 119071, Russia; dalypenko@gmail.com (D.A.L.); oleduff@mail.ru (A.V.D.); sergip74@gmail.com (S.I.P.); natalianek@yandex.ru (N.V.N.)

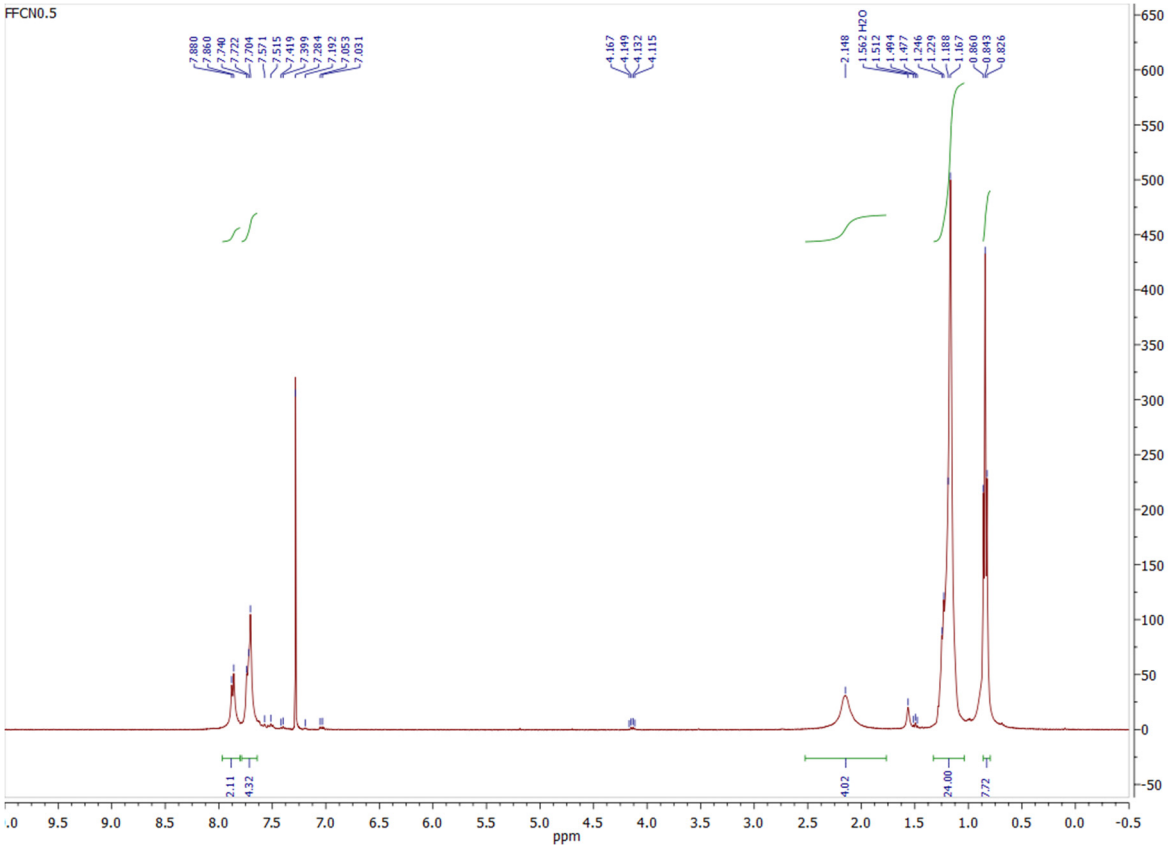
[3] Kirensky Institute of Physics, Federal Research Center KSC SB RAS, Krasnoyarsk 660036, Russia; felixnt@gmail.com

[4] School of Non-Ferrous Metals and Material Science, Siberian Federal University, Krasnoyarsk 660041, Russia; daha-ha@mail.ru

* Correspondence: yakimansky@yahoo.com; Tel.: +7-812-3237407

Table S1. FT-IR and ^{1}H NMR selected data for synthesized copolyfluorenes.

CPFs name	IR data, cm^{-1}	^{1}H NMR data, ppm
FFCN0.5	2921, s (ν_{as} CH_2) 2852, s (ν_s CH_2) 1454, s (ν_s C-C_{ar}) 812, s (δ CH_{ar})	7.88-7.86 (m, 2H), 7.74-7.70 (m, 4H), H_{ar} fluorene 4.14 (q, *J* = 7.0 Hz), $CH_3C\boldsymbol{H}_2O$- (terminal) 2.5-1.75 (m, 4H) CH_2 octyl 1.49 (t, *J* = 7.0 Hz) $C\boldsymbol{H}_3CH_2O$- (terminal) 1.25-1.17 (m, 22H), CH_2 octyl 0.86-0.83 (m, 10H), CH_2 and CH_3 octyl
FFCN1	2919, s (ν_{as} CH_2) 2853, s (ν_s CH_2) 1452, s (ν_s C-C_{ar}) 811, s (δ CH_{ar})	7.88-7.86 (m, 2H), 7.74-7.70 (m, 4H), H_{ar} fluorene 4.14 (q, *J* = 7.0 Hz), $CH_3C\boldsymbol{H}_2O$- (terminal) 2.5-1.75 (m, 4H) CH_2 octyl 1.49 (t, *J* = 7.0 Hz) $C\boldsymbol{H}_3CH_2O$- (terminal) 1.25-1.17 (m, 22H), CH_2 octyl 0.86-0.83 (m, 10H), CH_2 and CH_3 octyl
FFCN2.5	2920, s (ν_{as} CH_2) 2853, s (ν_s CH_2) 1454, s (ν_s C-C_{ar}) 812, s (δ CH_{ar})	7.88-7.86 (m, 2H), 7.74-7.70 (m, 4H), H_{ar} fluorene 4.14 (q, *J* = 7.0 Hz), $CH_3C\boldsymbol{H}_2O$- (terminal) 2.5-1.75 (m, 4H) CH_2 octyl 1.49 (t, *J* = 7.0 Hz) $C\boldsymbol{H}_3CH_2O$- (terminal) 1.25-1.17 (m, 22H), CH_2 octyl 0.86-0.83 (m, 10H), CH_2 and CH_3 octyl
PFCN0.5	2918, s (ν_{as} CH_2) 2853, s (ν_s CH_2) 1453, s (ν_s C-C_{ar}) 810, s (δ CH_{ar})	7.88-7.86 (m, 2H), 7.74-7.70 (m, 4H), H_{ar} fluorene 4.14 (q, *J* = 7.0 Hz), $CH_3C\boldsymbol{H}_2O$- (terminal) 2.5-1.75 (m, 4H) CH_2 octyl 1.49 (t, *J* = 7.0 Hz) $C\boldsymbol{H}_3CH_2O$- (terminal) 1.25-1.17 (m, 22H), CH_2 octyl 0.86-0.83 (m, 10H), CH_2 and CH_3 octyl
PFCN1	2918, s (ν_{as} CH_2) 2854, s (ν_s CH_2) 1453, s (ν_s C-C_{ar}) 812, s (δ CH_{ar})	7.88-7.86 (m, 2H), 7.74-7.70 (m, 4H), H_{ar} fluorene 4.14 (q, *J* = 7.0 Hz), $CH_3C\boldsymbol{H}_2O$- (terminal) 2.5-1.75 (m, 4H) CH_2 octyl 1.49 (t, *J* = 7.0 Hz) $C\boldsymbol{H}_3CH_2O$- (terminal) 1.25-1.17 (m, 22H), CH_2 octyl 0.86-0.83 (m, 10H), CH_2 and CH_3 octyl
PFCN2.5	2918, s (ν_{as} CH_2) 2854, s (ν_s CH_2) 1450, s (ν_s C-C_{ar}) 811, s (δ CH_{ar})	7.88-7.86 (m, 2H), 7.74-7.70 (m, 4H), H_{ar} fluorene 4.14 (q, *J* = 7.0 Hz), $CH_3C\boldsymbol{H}_2O$- (terminal) 2.5-1.75 (m, 4H) CH_2 octyl 1.49 (t, *J* = 7.0 Hz) $C\boldsymbol{H}_3CH_2O$- (terminal) 1.25-1.17 (m, 22H), CH_2 octyl 0.86-0.83 (m, 10H), CH_2 and CH_3 octyl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7.053
7.031
4.167
4.149
4.132
4.115
2.148
1.562 H2O
1.512
1.494
1.477
1.246
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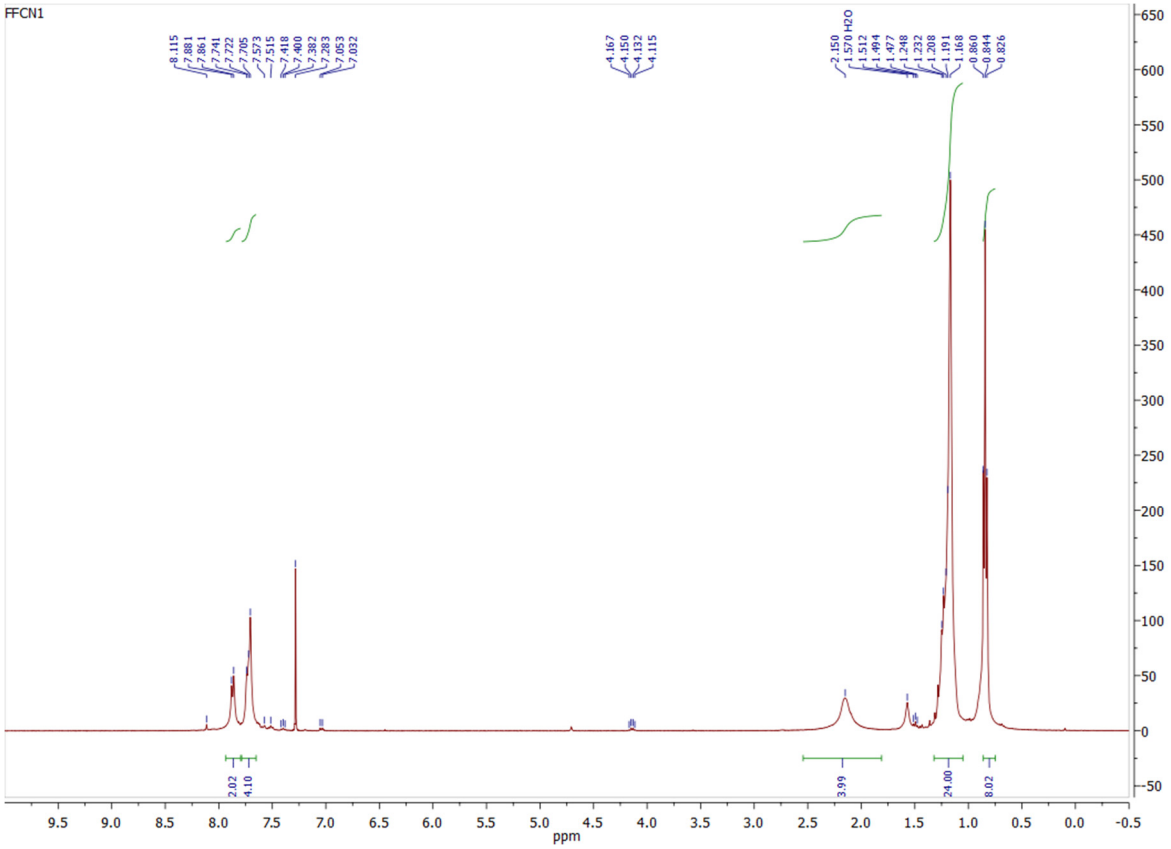
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7.400
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7.283
7.053
7.032
4.167
4.150
4.132
4.115
2.150
1.570 H2O
1.512
1.494
1.477
1.248
1.232
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8.02
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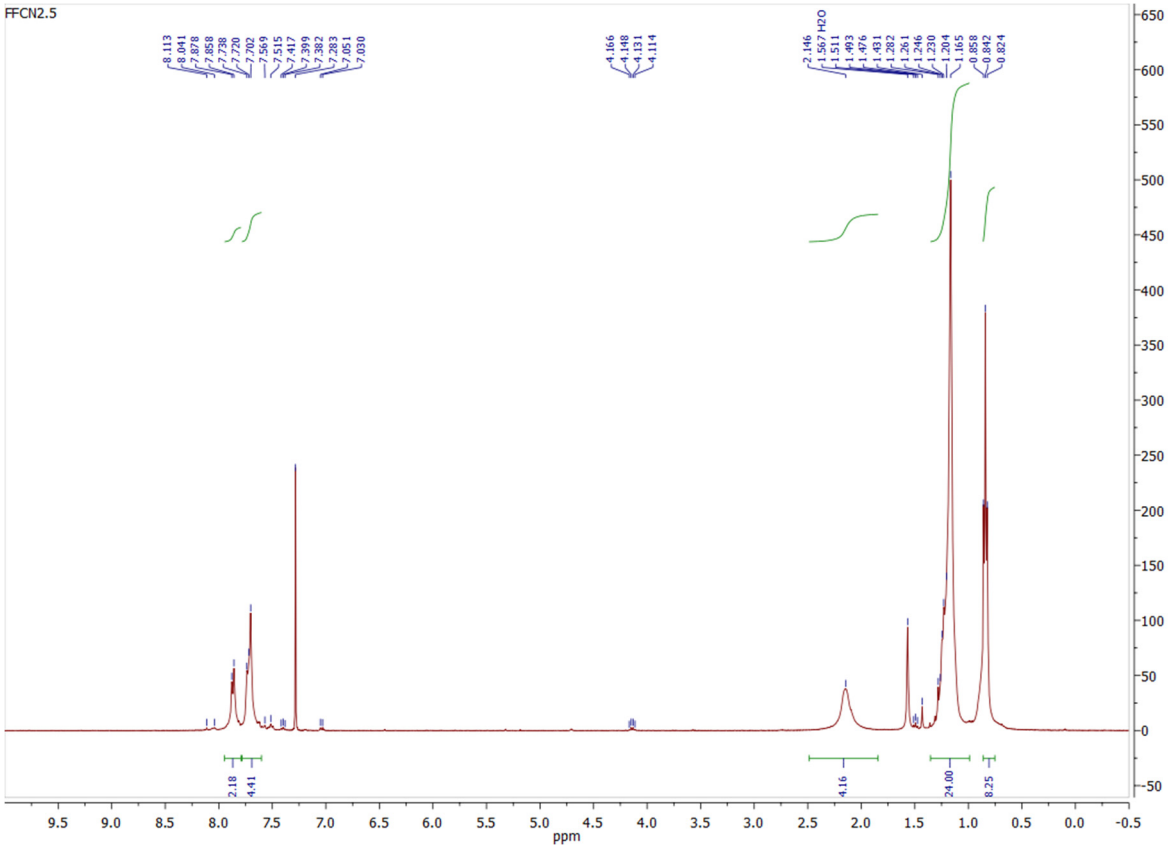
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7.417
7.399
7.382
7.283
7.051
7.030
4.166
4.148
4.131
4.114
2.146
1.567 H2O
1.511
1.493
1.476
1.451
1.282
1.261
1.246
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4.16
24.00
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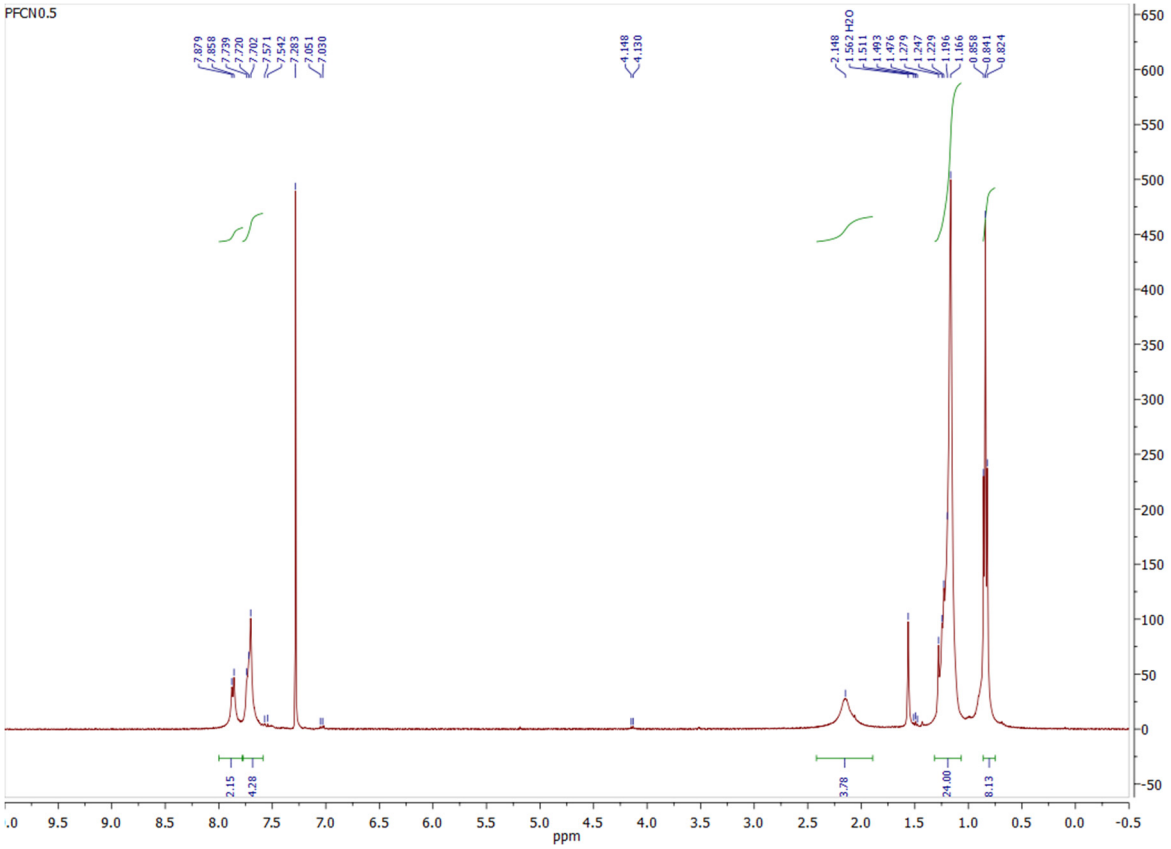
ppm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7.739
7.720
7.702
7.571
7.542
7.283
7.051
7.030
4.148
4.130
2.148
1.562 H2O
1.511
1.493
1.476
1.279
1.247
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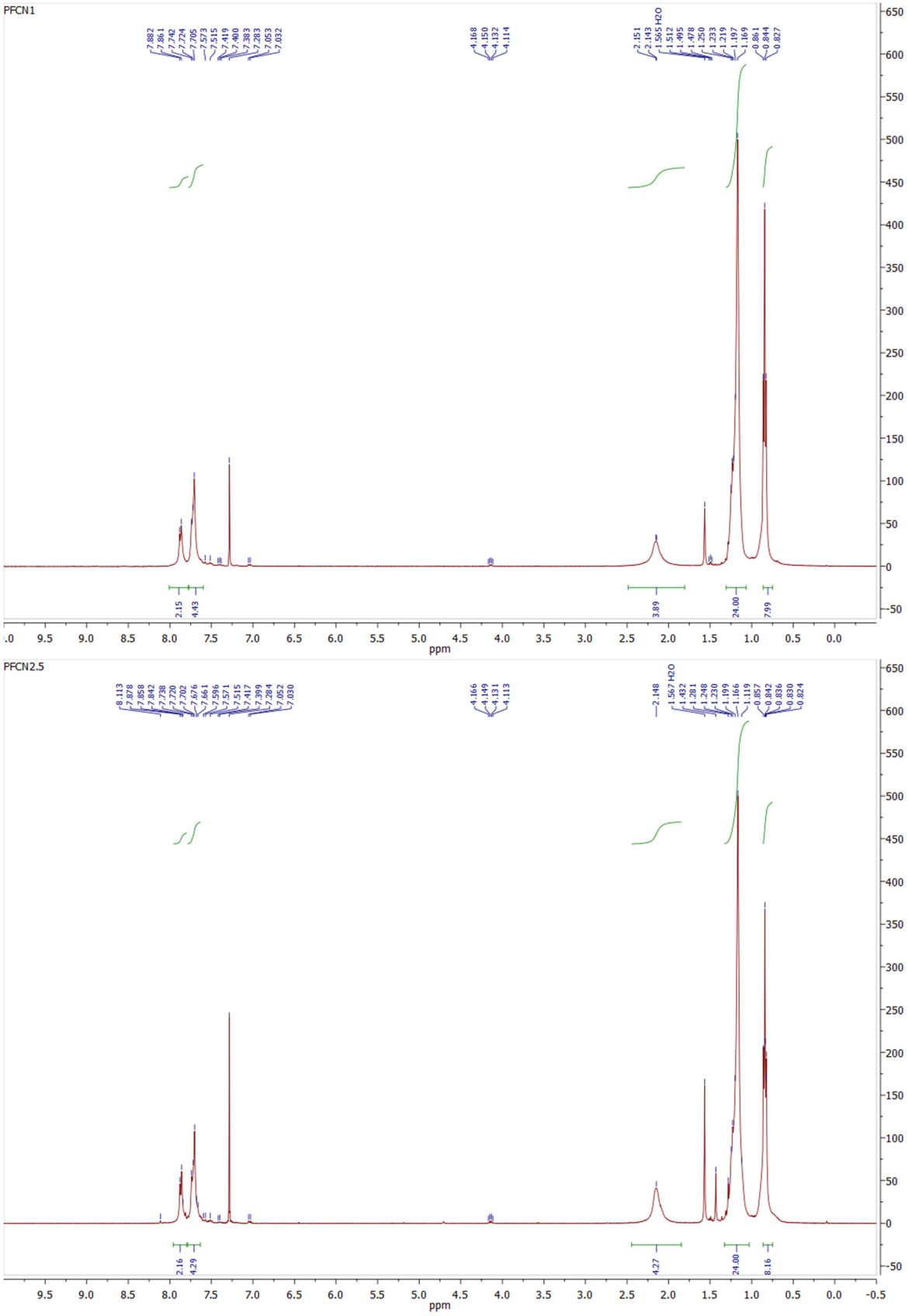

Figure S1. ^{1}H NMR spectra of CPFs in $CDCl_3$.

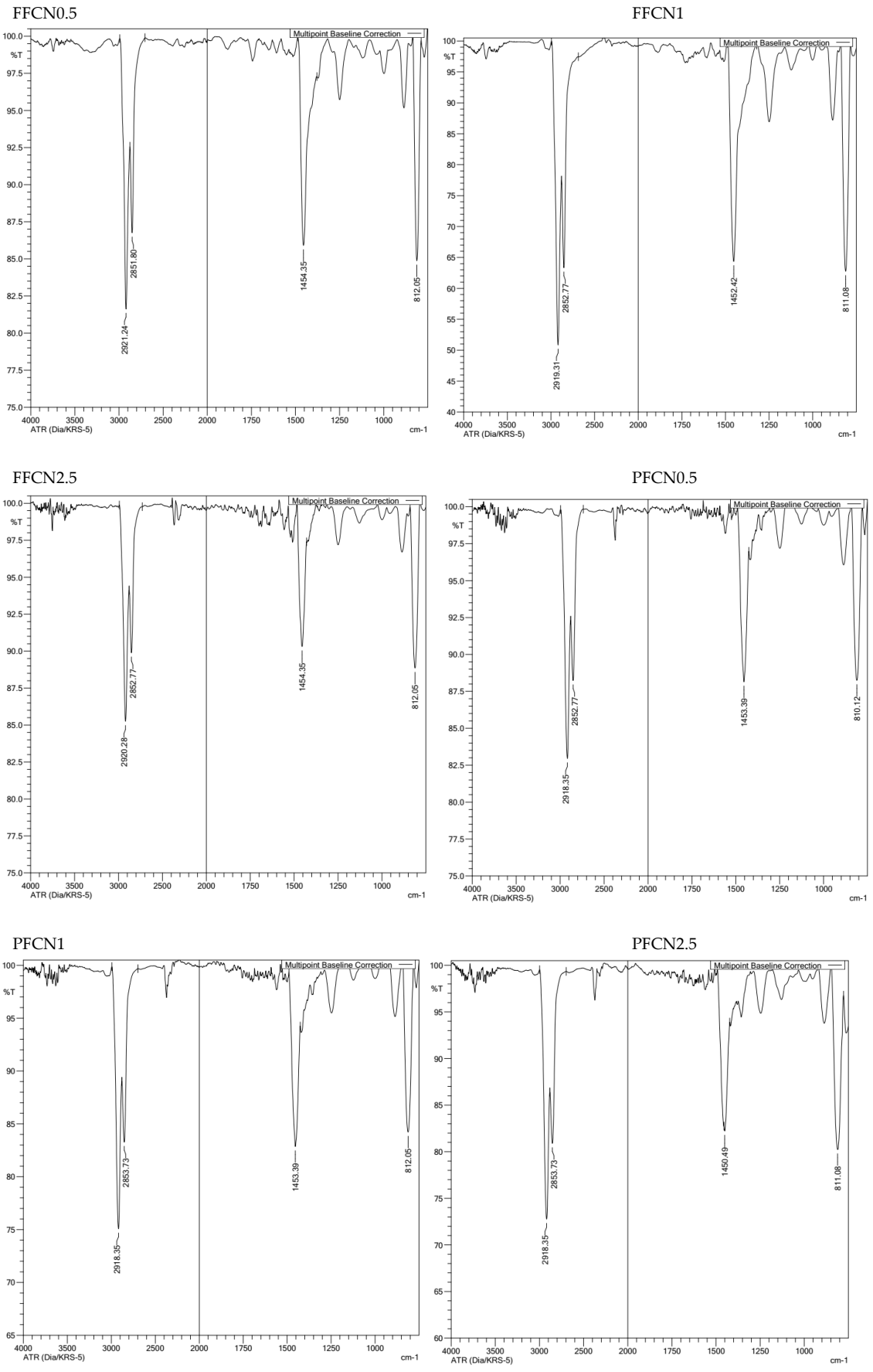

Figure S2. FT-IR spectra of synthesized CPFs.

Table S2. Spectral data for CPFs films after heating for 4h at 80°C.

CPFs name	λ_{abs}, nm	λ_{em}, nm	Stokes shift, nm/cm^{-1}/eV
FFCN0.5	385, 424*	542	118/5135/0.64
FFCN1	385, 426*	545	119/5126/0.64
FFCN2.5	382, 422*	551	129/5548/0.69
PFCN0.5	385, 426*	499	73/3434/0.43
PFCN1	385, 426*	505	79/3672/0.46
PFCN2.5	385, 424*	463	39/1987/0.25

* Shoulder

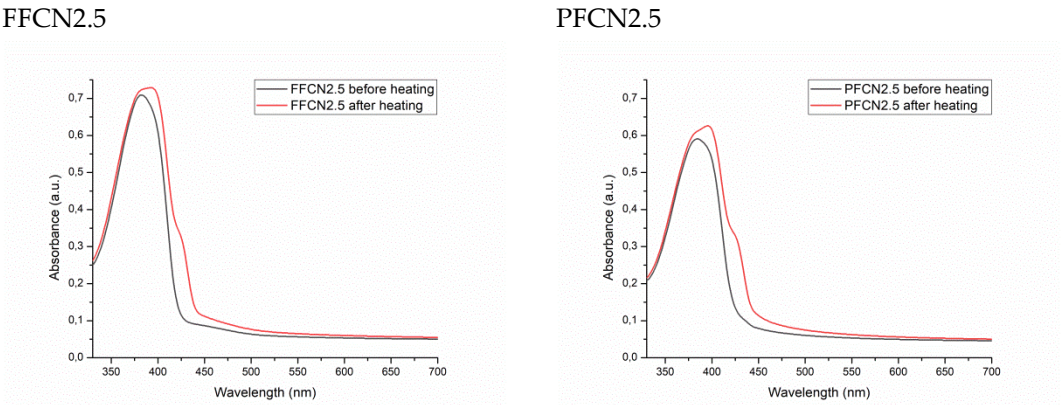

Figure S3. UV-vis spectra of FFCN2.5 and PFCN2.5 films before (black line) and after heating at 80°C (red line).

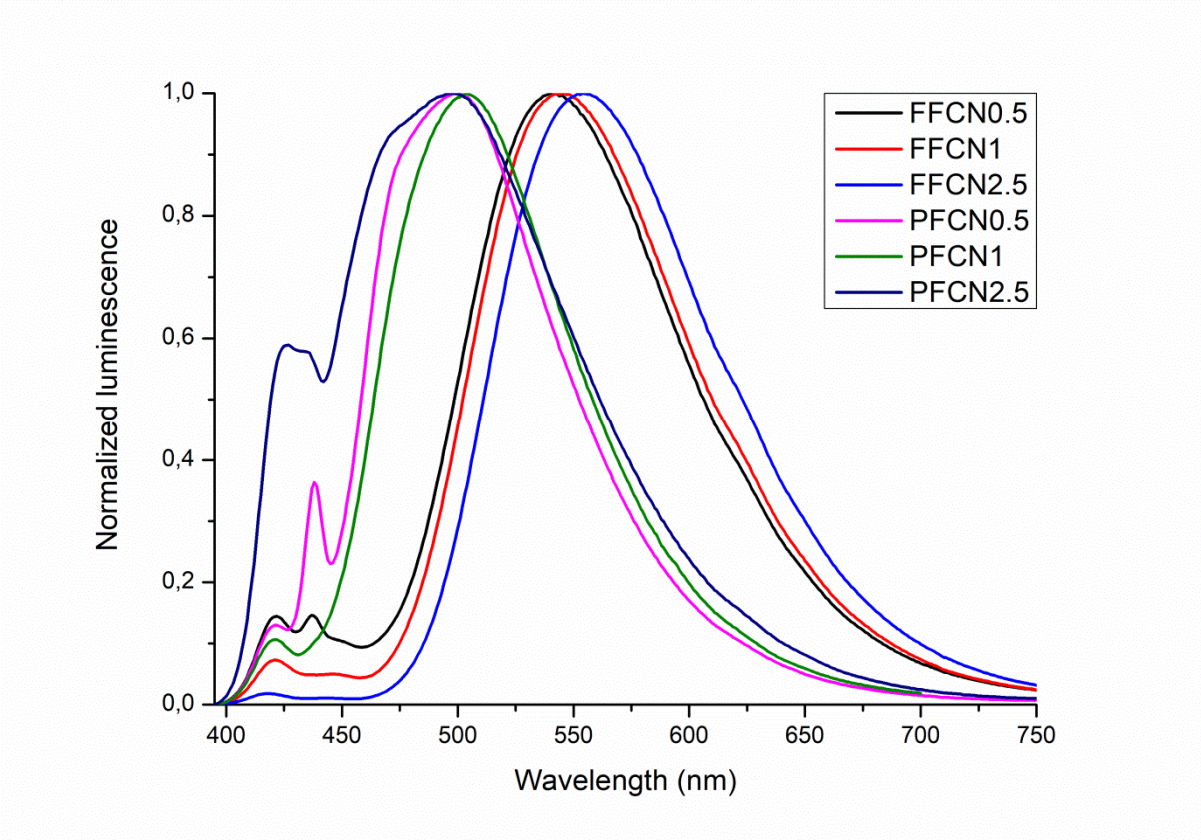

Figure S4. Luminescence spectra of CPFs films (λ_{ex} = 385 nm).

Cyclic Voltammetry

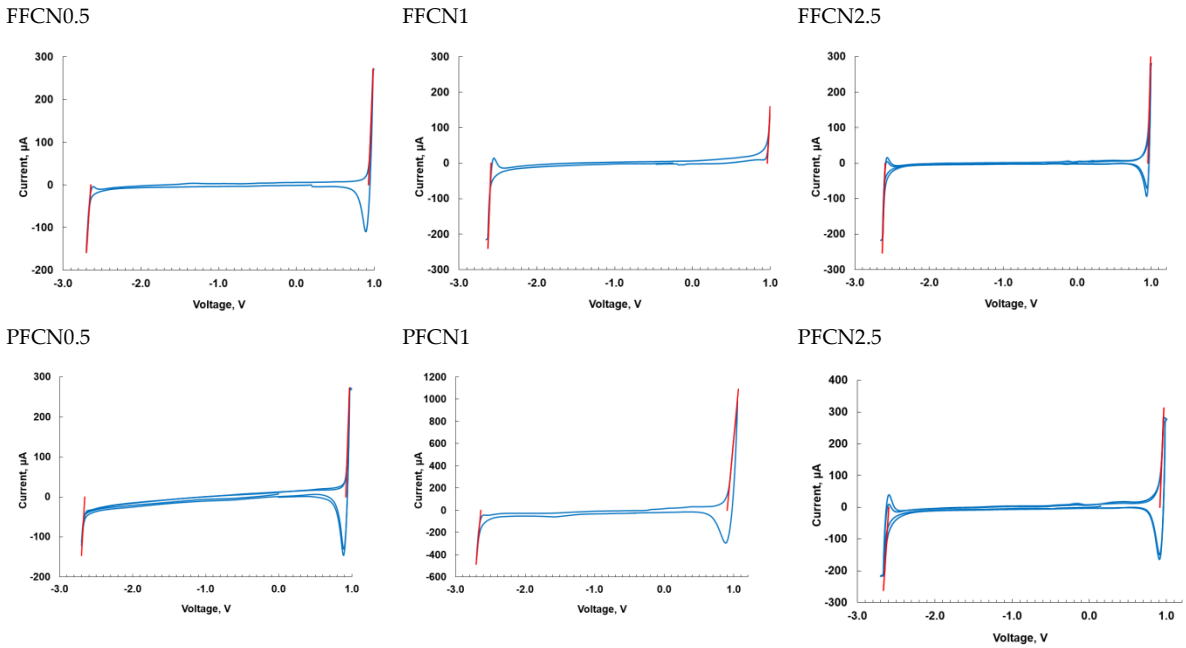

Figure S5. CVA curves for CPFs.