Supporting information

High throughput processing of dinaphtho[2,3-b:2',3'-f]thieno[3,2-b]thiophene (DNTT) organic semiconductors

Lamiaa Fijahi, [a,⊥] Jinghai Li, [a,⊥] Adrián Tamayo, [a] Martina Volpi,[b] Guillaume Schweicher,[b]

Yves H. Geerts,[b,c] and Marta Mas-Torrent[a,*]

[a] Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus de la UAB, 08193 Bellaterra, Barcelona, Spain. E-mail: mmas@icmab.es

[b] Laboratoire de Chimie des Polymères, Faculté des Sciences, Université Libre de Bruxelles (ULB), Boulevard du Triomphe, CP 206/01, 1050 Bruxelles, Belgium

[c] International Solvay Institutes for Physics and Chemistry, Université Libre de Bruxelles (ULB), Boulevard du Triomphe, CP 231, 1050 Bruxelles, Belgium

[⊥] Equally contributed

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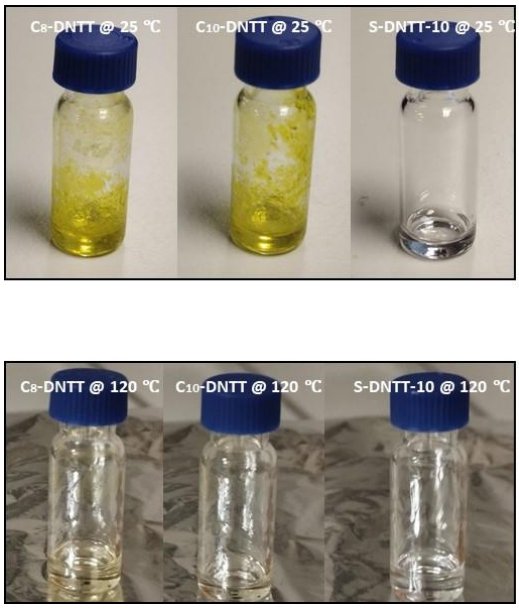

Figure S1. Solutions prepared with the different DNTT derivatives in PhCl (2% wt.) at 25 and 120 ºC.

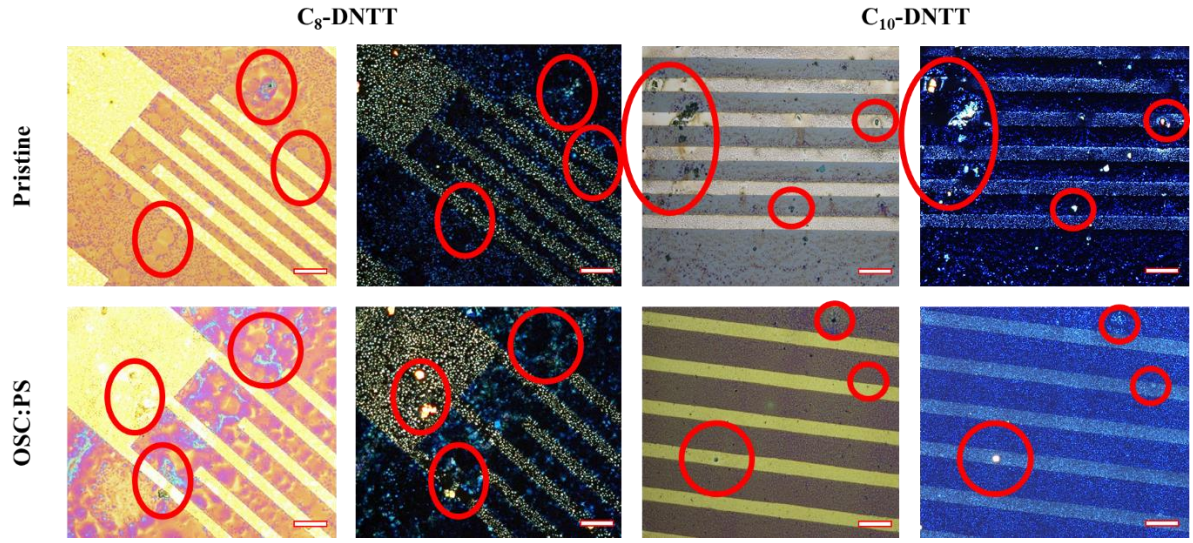

Figure S2. Non-polarised and polarised optical microscopy images of thin films based on C_8-DNTT, C_{10}-DNTT, C_8-DNTT:PS and C_{10}-DNTT:PS deposited by BAMS at 10 mm/s on SiO_2/Si substrates at 105ºC. Scale bar: 100 µm. Defects in the films or precipitated crystals are observed (highlighted with a red circle).

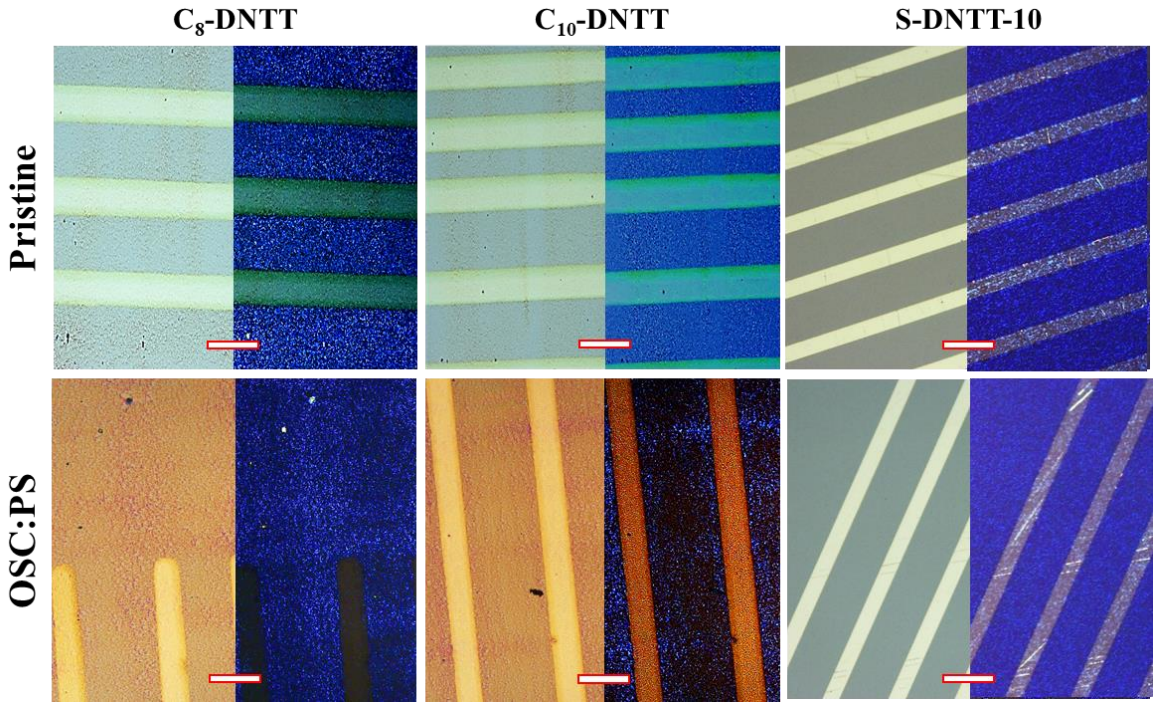

Figure S3. Non polarised and polarised optical microscopy images of the films based on OSC and OSC:PS films deposited by BAMS at 10 mm/s on SiO_2/Si substrates, at 105ºC in the case of S-DNTT-10, and at 120ºC for the C_n-DNTT derivatives. Scale bar: 100 µm.

Table S1. X-ray crystal data for C_8-DNTT, C_{10}-DNTT and S-DNTT-10 OSCs.

	C_8-DNTT[a]	**C_{10}-DNTT[b]**	**S-DNTT-10[c]**
Chemical formula	C38H44S2	C42H52S2	C42H52S2
Temperature (K)	293	298	
Cell Lengths (Å)	a = 5.9874	a = 6.0867	a = 7.76
	b = 7.8611	b = 8.0301	b = 7.08
	c = 34.0658	c = 37.9349	c = 32.30
Cell Angles (°)	α = 90	α = 90.897	α = 92.20
	β = 99.860	β = 86.298	β = 90.00
	γ = 90	γ = 90.131	γ = 90.00
Cell Volume (Å^3)	1579.71	1850.04	
Z	2	2	

[a]Extracted from the crystal structure reported in reference [1]

[b]Extracted from the crystal structure reported in reference [2]

[c]Extracted from reference [3]

Table S2. Structural parameters of the thin films based on C_8-DNTT, C_{10}-DNTT and S-DNTT-10 deposited by BAMS technique and estimation of the molecular inclination angle with respect to the substrate normal (Θ_{titl}). [a]Molecular length with extended alkyl chains, estimated from the crystal structure.[1,2] [b]Molecular length of the S-DNTT-10 extracted from ref 3.

	d^{001} (Å)	**L (Å)**	**Θ_{titl}(°)**
C_8-DNTT	33.4	34.1[a]	11
C_{10}-DNTT	37.4	38.9[a]	16
S-DNTT-10	31.5	38.7 [b]	35

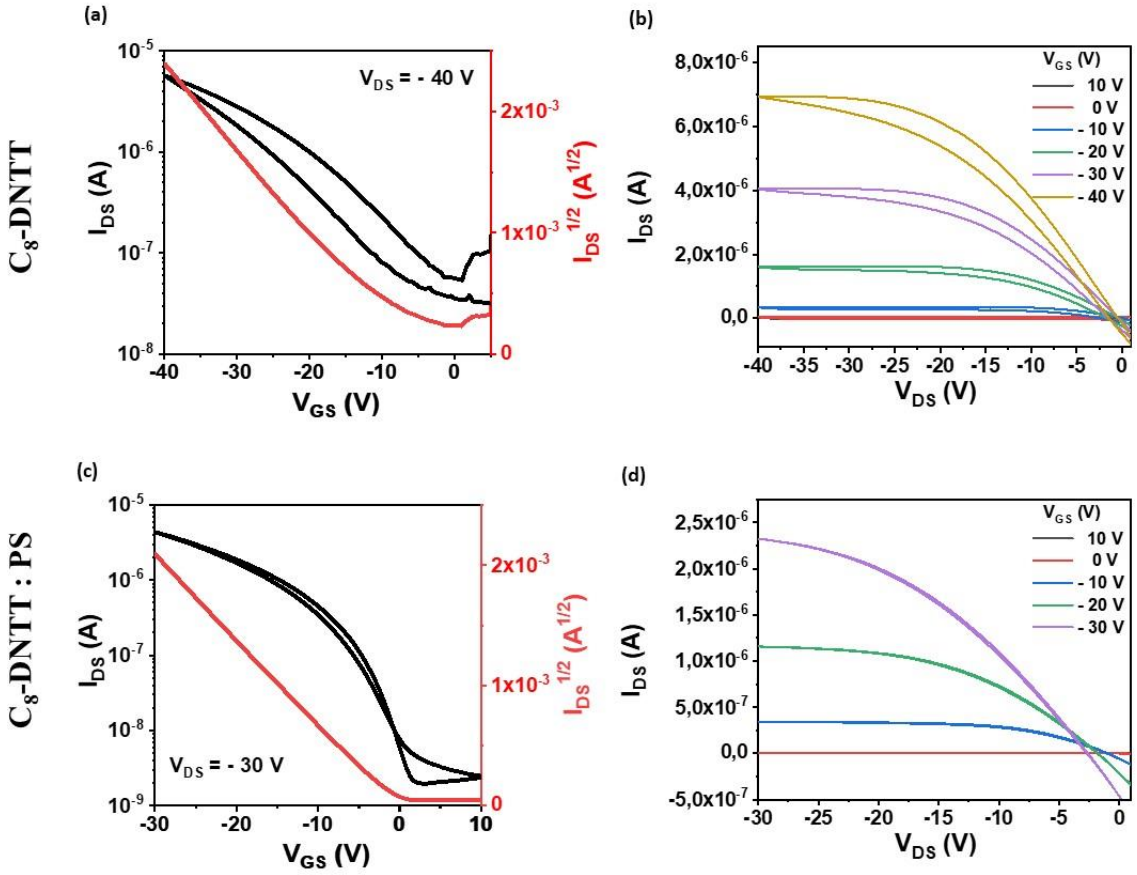

Figure S4. Transfer characteristics in the saturation regime (a,c) and output characteristics (b,d) of OFETs based on C_8-DNTT and C_8-DNTT:PS films.

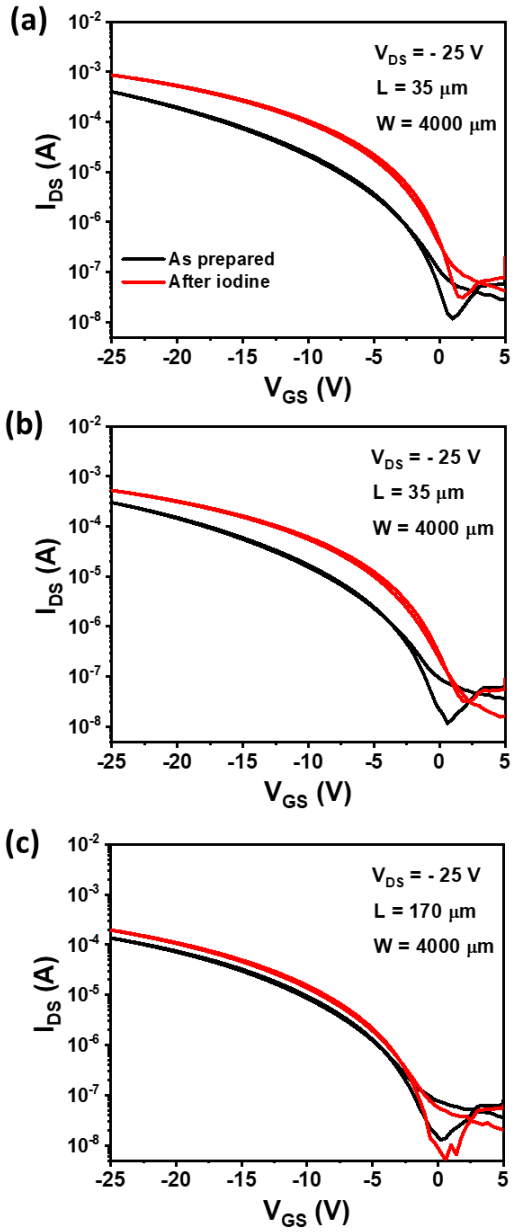

Figure S5. Representative transfer characteristic curves of OFETs based on S-DNTT-10:PS before (black) and after (red) iodine water solution exposition. OFET devices with channel length of (a) 35, (b) 80 and (c) 170 μm.

References

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2 F. Talnack, S. Hutsch, M. Bretschneider, Y. Krupskaya, B. Büchner, M. Malfois, M. Hambsch, F. Ortmann and S. C. B. Mannsfeld, *Mol. Syst. Des. Eng.*, 2022, **7**, 507–519.

3 Y. Yamaguchi, Y. Kojiguchi, S. Kawata, T. Mori, K. Okamoto, M. Tsutsui, T. Koganezawa, H. Katagiri and T. Yasuda, *Chem. Mater.*, 2020, **32**, 5350–5360.