

Supporting Information

Modulating surface morphology and thin film transistor performance of bi-thieno[3,4-c]pyrrole-4,6-dione based polymer semiconductor by altering pre-aggregation in solution

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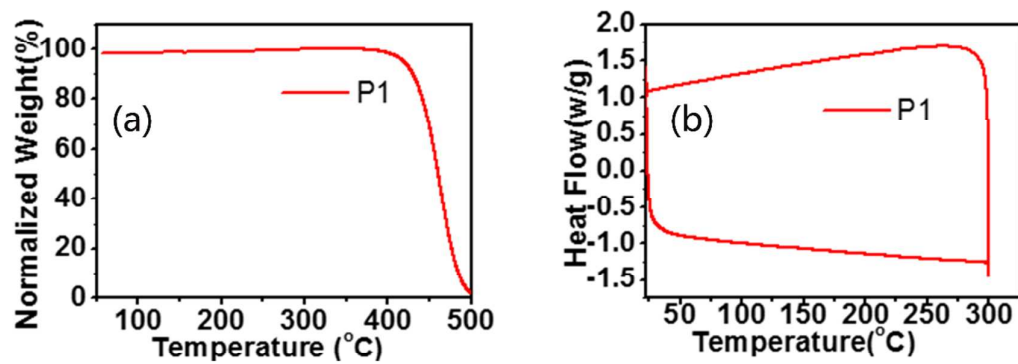


Figure S1. (a) TGA and (b) DSC curves of **P1**

Table S1 Transistor performances of **P1** films dip-coated at different lifting rates

Lifting rate mm / min	$\mu_{\text{max(av)}}^{\text{a}}$ $\text{cm}^2 / (\text{V}\cdot\text{s})$	V_{th} V	$I_{\text{on}}/I_{\text{off}}$
1	0.19 (0.12)	-10~-15	$10^{5\sim6}$
5	0.28 (0.19)	-10~-20	$10^{5\sim6}$
10	0.43 (0.29)	-5~-20	$10^{5\sim6}$
25	0.54 (0.35)	-10~-20	$10^{5\sim6}$
50	0.41 (0.26)	-3~-15	$10^{5\sim6}$
100	0.18 (0.16)	-10~-20	$10^{5\sim6}$

^a The solution concentration and temperature are not optimized

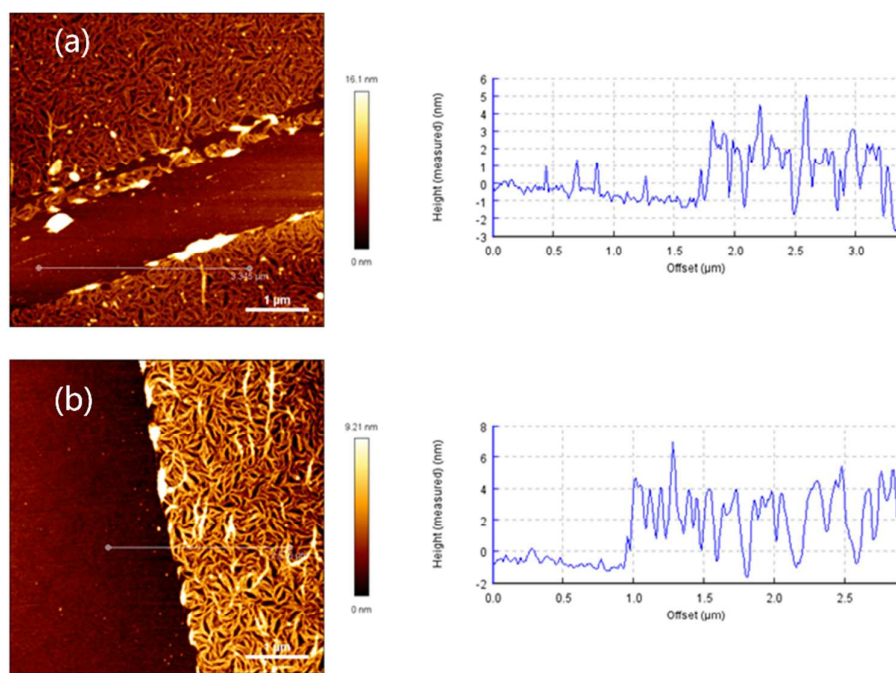


Figure S2. AFM images of P1 dip-coated at temperature of (a) 40 °C and (b) 50 °C

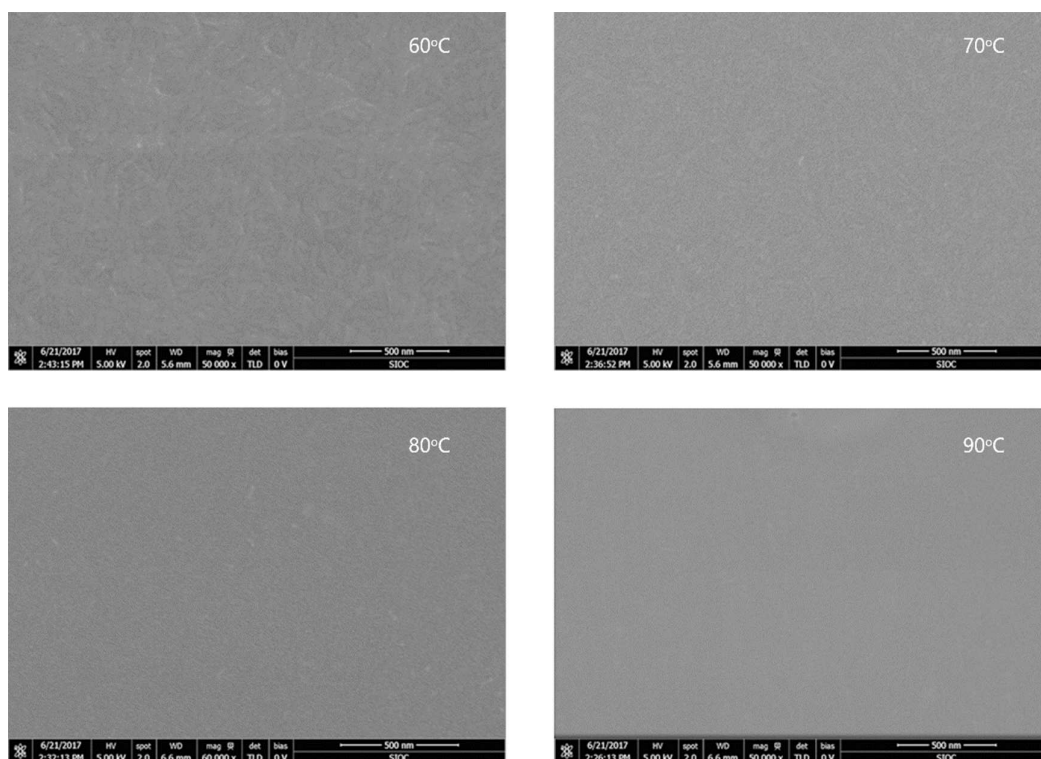


Figure S3. SEM images of P1 dip-coated at temperature of 60 °C, 70 °C, 80°C and 90 °C

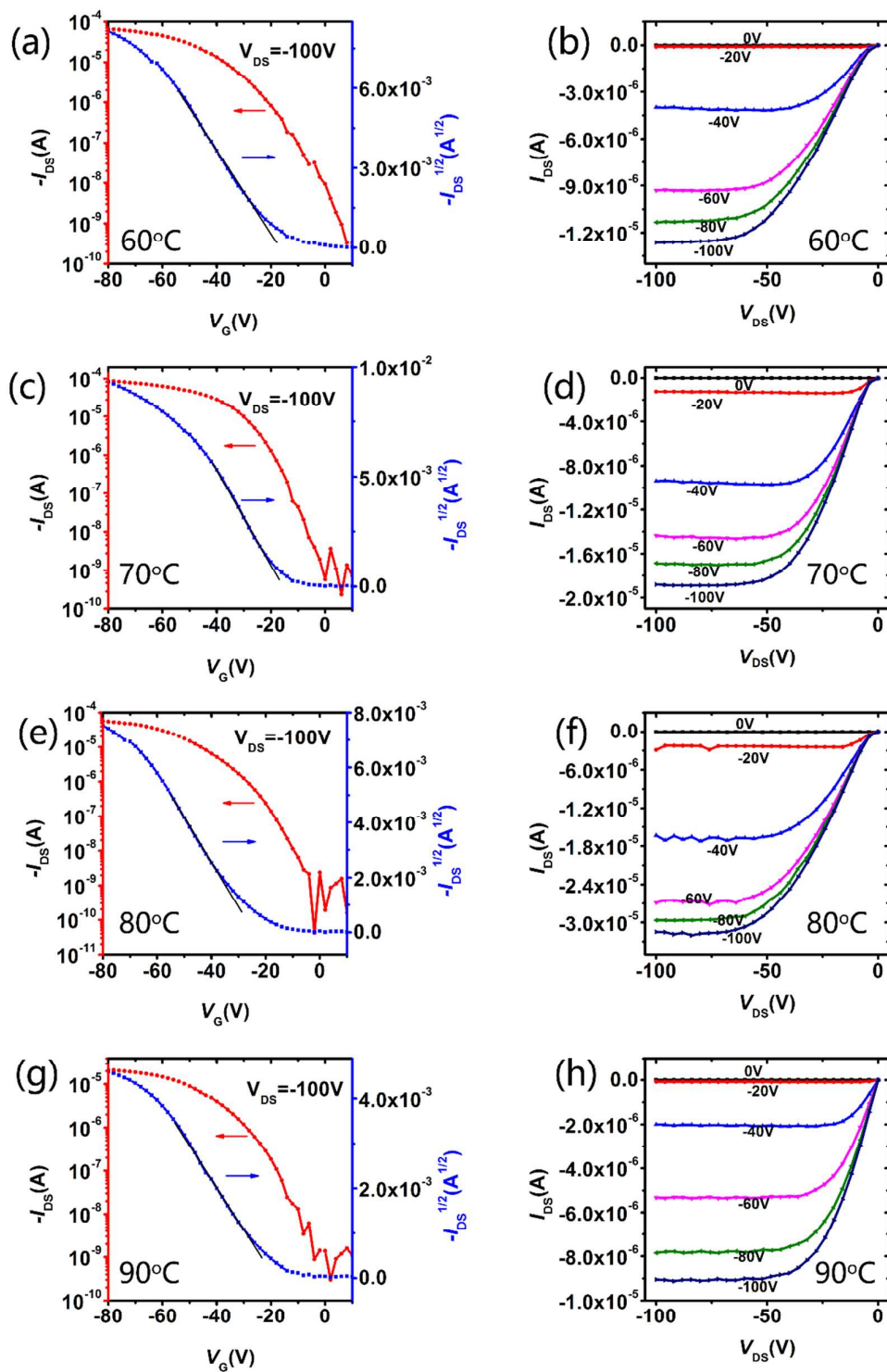


Figure S4. Transfer curves (a, c, e, g) and output curves (b, d, f, h) of P1 films dip-coated at different solution temperatures.

Table S2. Transistor performance of **P1** film fabricated by drop-casting (solution: 0.05 mg / mL TCE)

Solution temperature °C	$\mu_{\text{max}}/\mu_{\text{ave}}$ $\text{cm}^2 / (\text{V}\cdot\text{s})$	V_{th} V	$I_{\text{on}}/I_{\text{off}}$
20	$0.027 (1.78 \pm 0.57) \times 10^{-2}$	21.87 ± 2.46	10^{5-6}
50	$0.085 (4.16 \pm 2.45) \times 10^{-2}$	18.97 ± 3.71	10^{5-6}
60	$0.199 (5.19 \pm 4.78) \times 10^{-2}$	19.31 ± 5.82	10^{5-6}
70	0.131 $(1.07 \pm 0.25) \times 10^{-1}$	35.33 ± 5.63	10^{5-6}
80	$0.185 (1.64 \pm 0.22) \times 10^{-1}$	24.33 ± 5.82	10^{5-6}
90	$0.148 (7.02 \pm 4.16) \times 10^{-2}$	31.73 ± 5.35	10^{5-6}

(3)可能的分子式或结构式: $C_{100}H_{154}F_{24}N_4O_4S_8$

(4)大约百分含量: C 71.55 H 9.25 N 1.67

中国科学院上海有机化学研究所分析测试中心

元素分析报告

送样单位: 高分子材料化学

样品名称: WH2-7-59

送样者: 吴洪年

登记编号: 2393

分析结果

样品重量		1.785	mg	2.708	mg	mg
百分含量	N	12.3	%	1.35	%	%
	C	70.93	%	71.08	%	%
	H	9.40	%	9.33	%	%

分析日期: 2017 年 4 月 14 日

Figure S5. Elemental analysis data of P1