

Supporting Information

## Pendant Group Effects on the Optical and Electrical Properties of Carbazole-Diketopyrrolopyrrole Copolymers

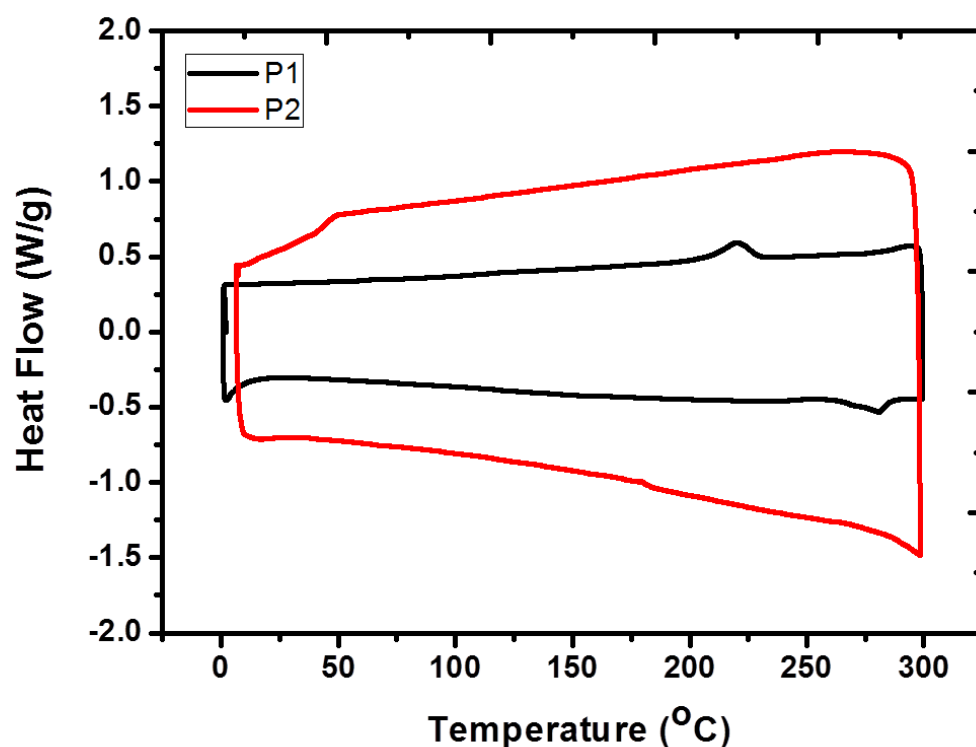
Obum Kwon,<sup>a</sup> Jang Jo,<sup>b</sup> Bright Walker,<sup>c</sup> Guillermo C. Bazan,<sup>a</sup> and Jung Hwa Seo<sup>\*d</sup>

<sup>a</sup>Department of Chemistry & Biochemistry, University of California, Santa Barbara, California 93106

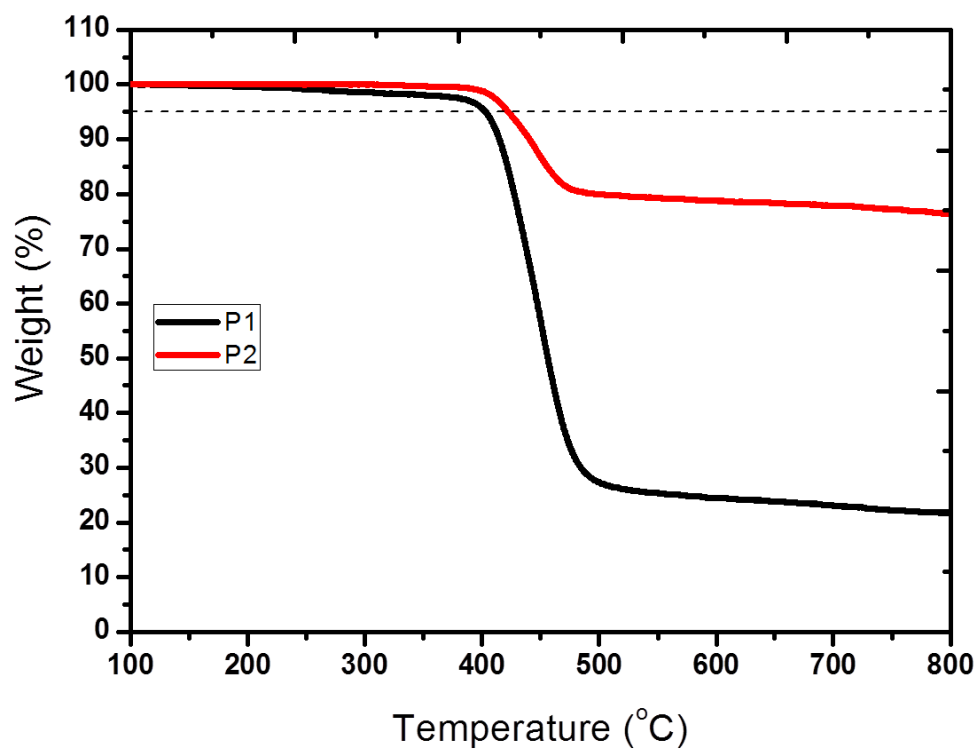
<sup>b</sup>Department of Physics, University of California, Santa Barbara, California 93106

<sup>c</sup>Department of Interdisciplinary Green Energy, Ulsan National Institute of Science and Technology, Ulsan 689-798, South Korea

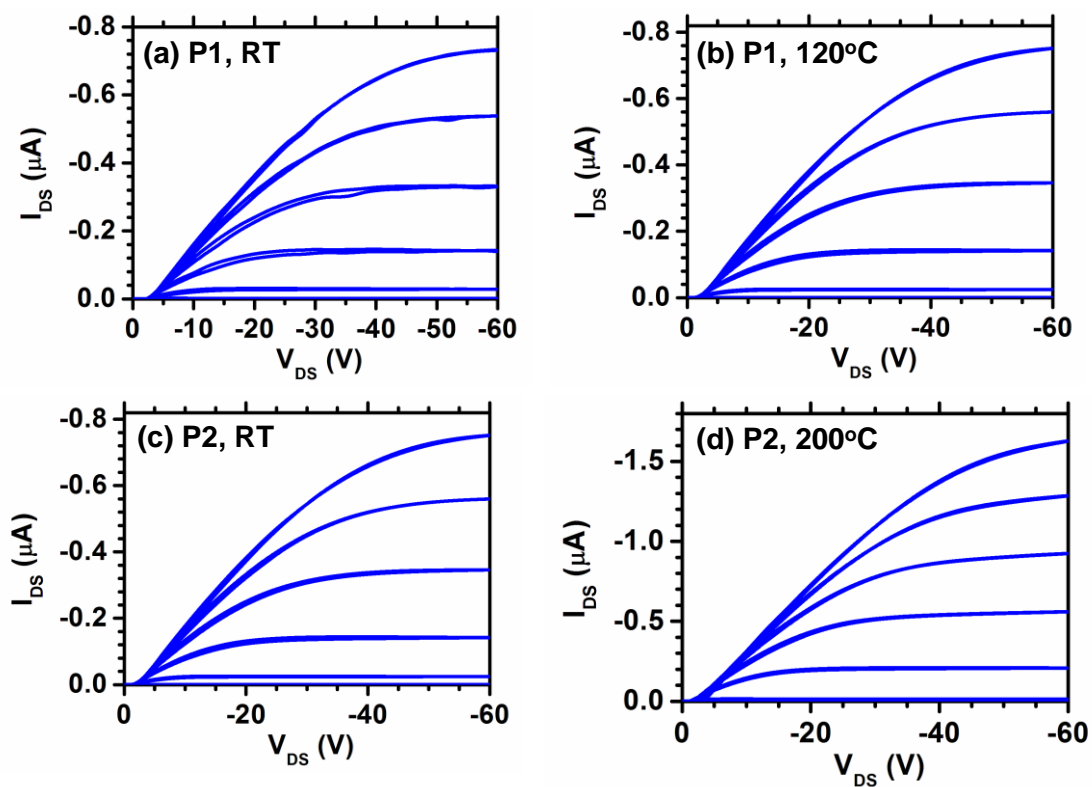
<sup>d</sup>Department of Materials Physics, Dong-A University, Busan 614-070, South Korea

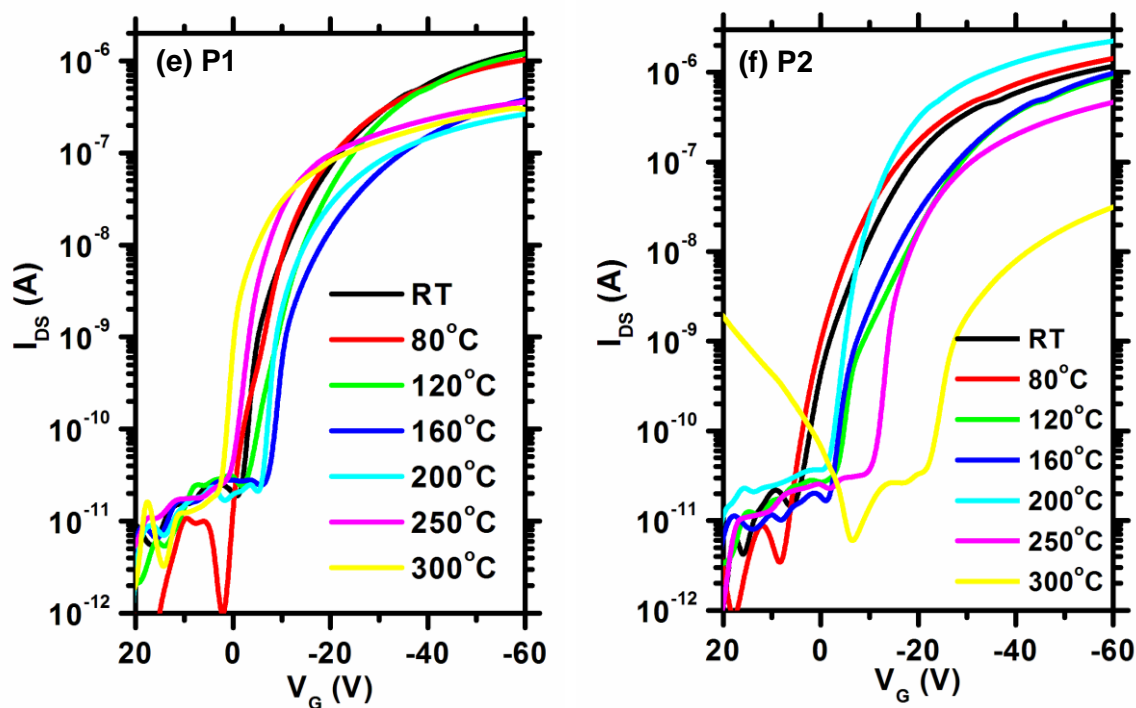


**Figure S1.** Differential Scanning Calorimetry (DSC) traces of **P1** and **P2**.



**Figure S2.** Thermogravimetric Analysis (TGA) of **P1** and **P2**.

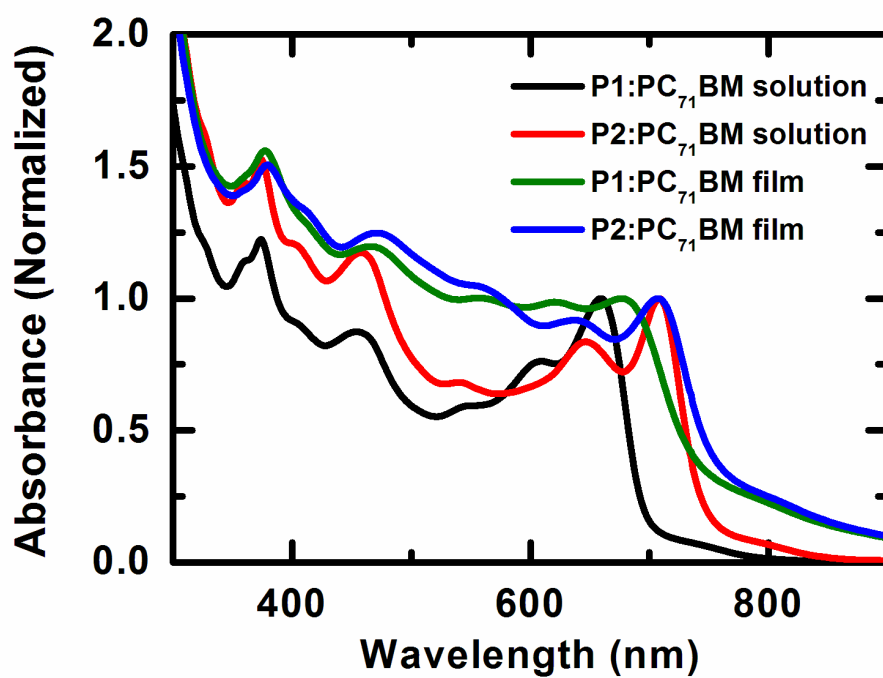




**Figure S3.** Output curves of **P1** FETs (a) at room temperature and (b) annealed at 120°C and **P2** FETs (c) at room temperature and (d) annealed at 200°C. Transfer curves of (e) **P1** and (f) **P2** FETs as a function of annealing temperature.

**Table 1.** Summary of device performance of **P1** and **P2** FETs with various annealing temperatures.

Annealing Temp. (°C)	<b>P1</b>			<b>P2</b>		
	$\mu$ (cm <sup>2</sup> /V·s)	$V_{th}$ (V)	$I_{on}/I_{off}$	$\mu$ (cm <sup>2</sup> /V·s)	$V_{th}$ (V)	$I_{on}/I_{off}$
RT	$1.3 \times 10^{-3}$	-6.7	$1.6 \times 10^7$	$1.6 \times 10^{-3}$	-6	$2.6 \times 10^6$
80	$1.2 \times 10^{-3}$	-8.5	$1.0 \times 10^7$	$1.6 \times 10^{-3}$	-3	$2.9 \times 10^6$
120	$1.7 \times 10^{-3}$	-11	$6.8 \times 10^5$	$1.6 \times 10^{-3}$	-16	$3.5 \times 10^5$
160	$4.3 \times 10^{-4}$	-9	$3.9 \times 10^5$	$1.4 \times 10^{-3}$	-14	$6.0 \times 10^5$
200	$3.9 \times 10^{-4}$	-6	$5.7 \times 10^6$	$4.4 \times 10^{-3}$	-6	$7.5 \times 10^5$
250	$8.6 \times 10^{-4}$	-1	$1.7 \times 10^5$	$7.4 \times 10^{-4}$	-12	$1.6 \times 10^6$
300	$5.0 \times 10^{-4}$	-1	$1.2 \times 10^6$	$5.3 \times 10^{-5}$	-20	$1.1 \times 10^5$



**Figure S4.** UV-Vis absorption spectra of **P1:PC<sub>71</sub>BM** and **P2:PC<sub>71</sub>BM** in solution and film.