Supplementary Information

A Facile and Robust Approach to Prepare Fluorinated Polymer Dielectric for Probing Intrinsic Transport Behavior of Organic Semiconductors

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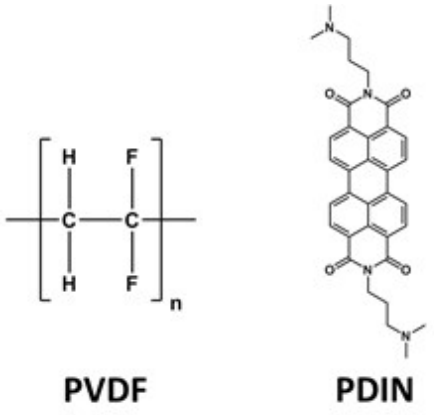

Figure S1. Chemical structures polyvinylidene difluoride (**PVDF**) 2,9-bis(3-(dimethylamino)propyl)anthra[2,1,9-def:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2H,9H)-tetraone (**PDIN**).

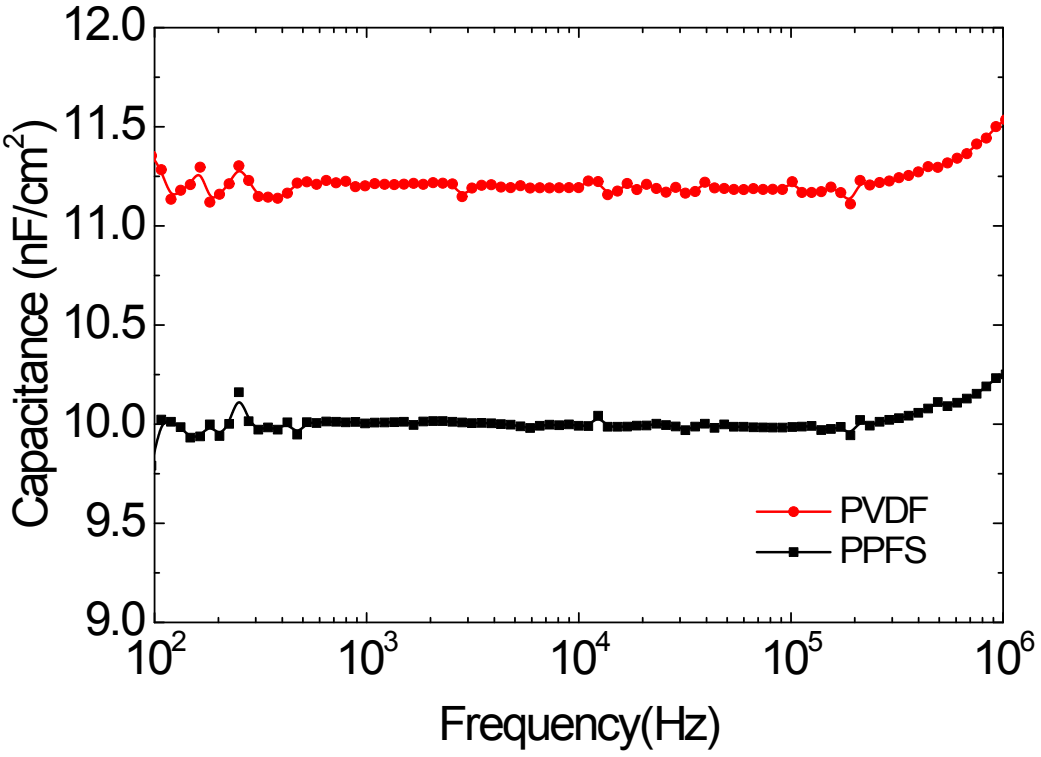

Figure S2. The dependence of capacitance values on frequency of **PVDF** and **PPFS**.

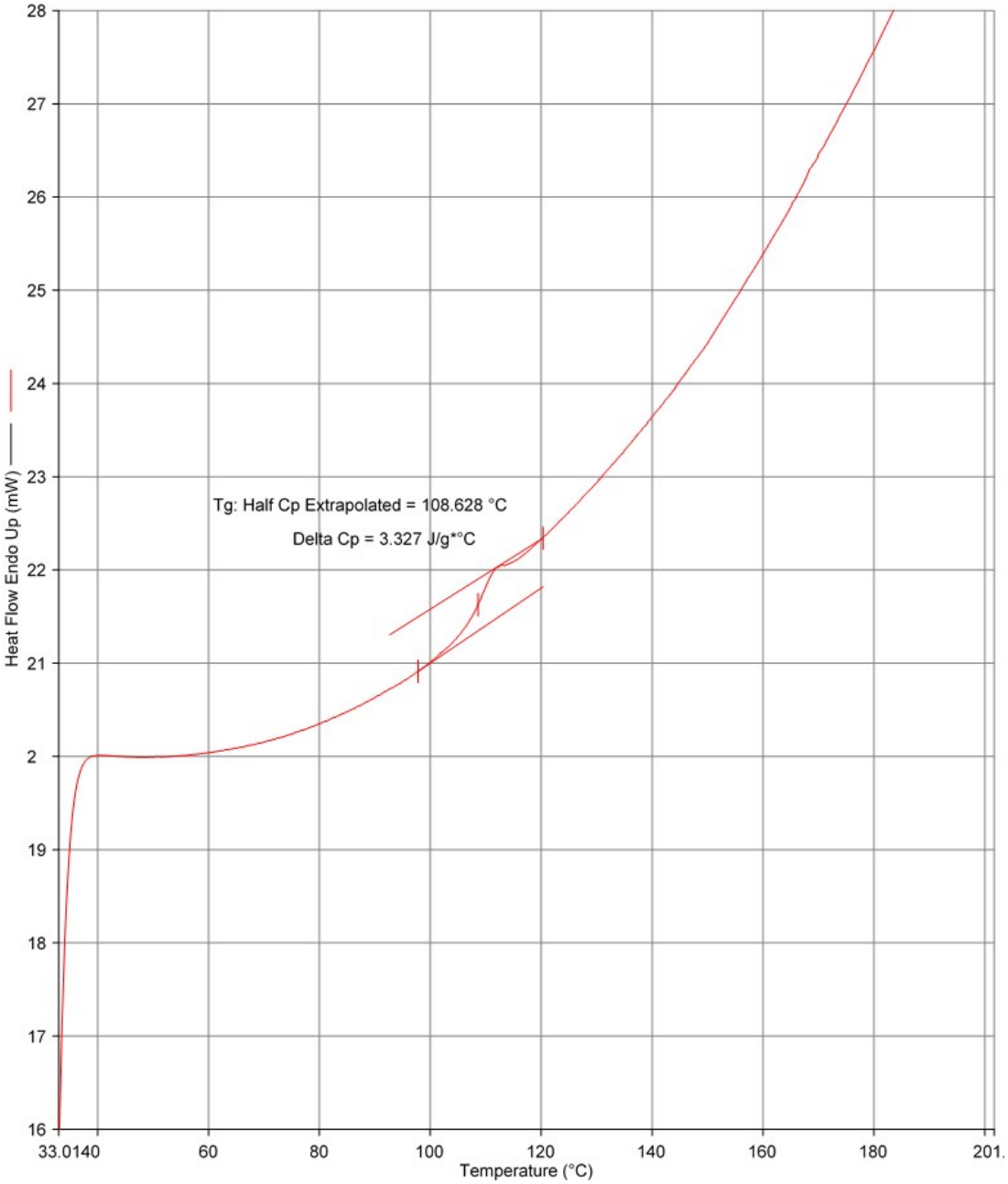

Figure S3. DSC spectrum of **PPFS** synthesized in glovebox.

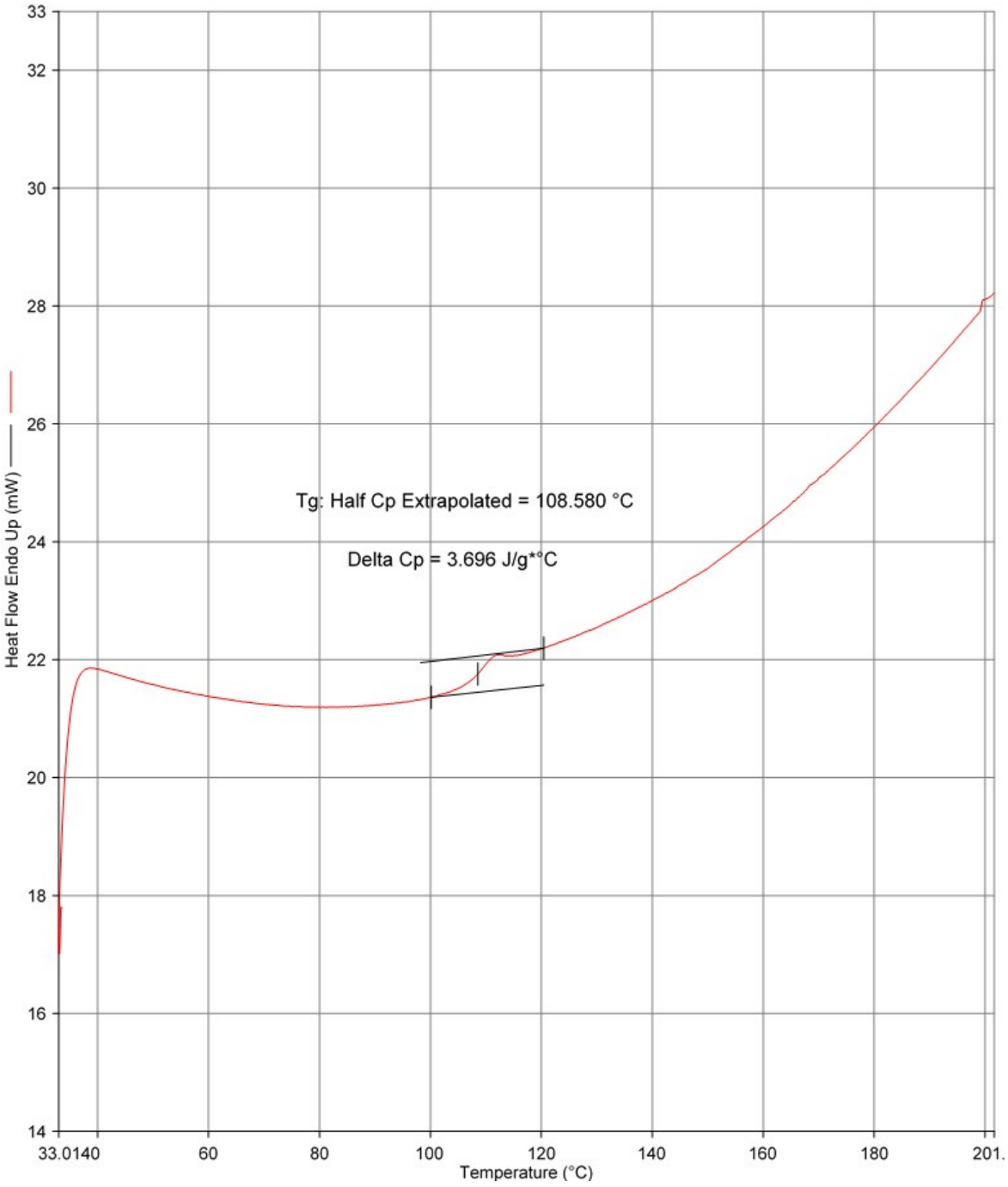

Figure S4. *DSC spectrum of **PPFS** synthesized in ambient.*

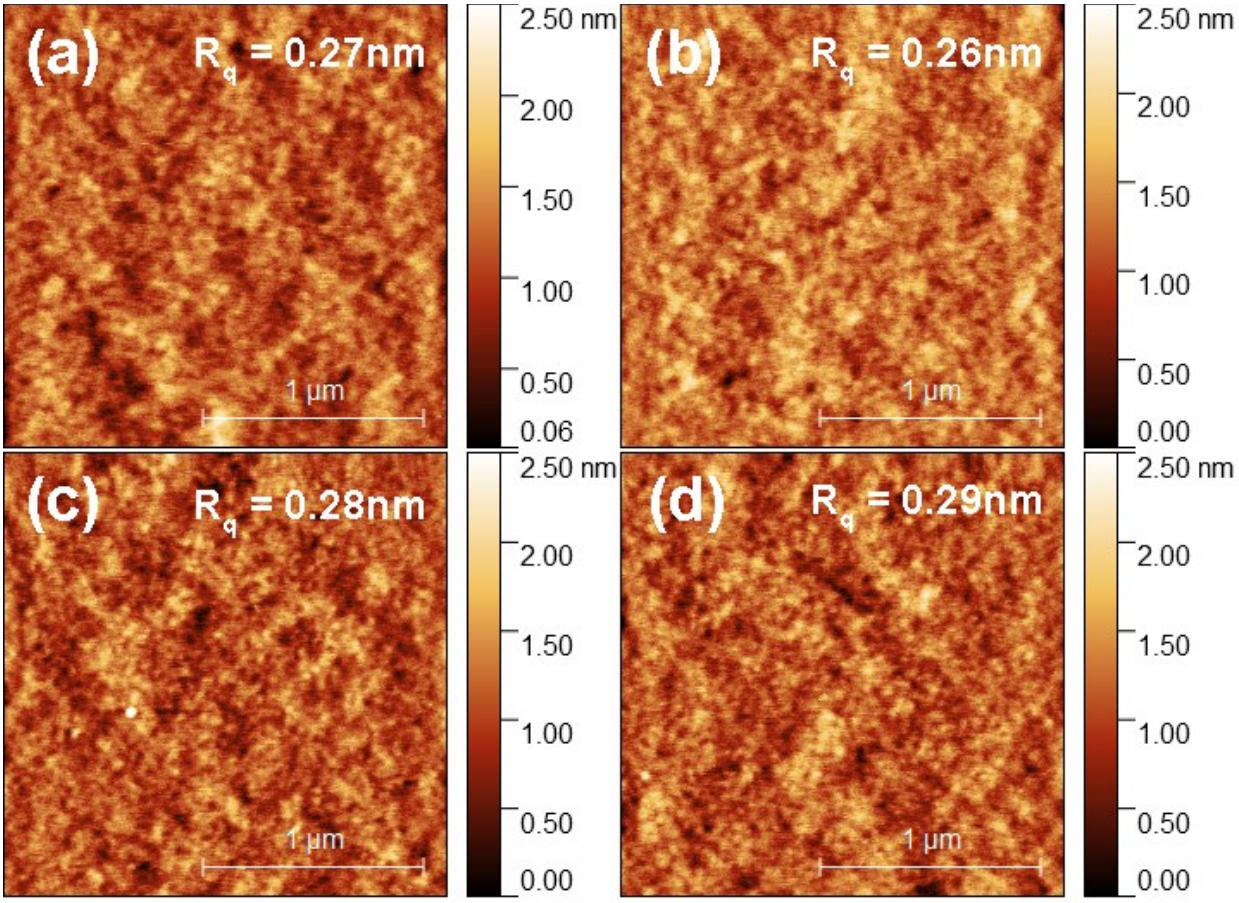

Figure S5. AFM images of **(a)** Pristine PPFS polymer thin film; **(b)** Chloroform; **(c)** Chlorobenzene and **(d)** Toluene treated PPFS polymer thin film.

Note: **PPFS** thin film on silicon dioxide substrate were submerged in three common organic solvents (chloroform, chlorobenzene and toluene) for 5 minutes. The samples were taken out and dried for AFM analysis to look into the morphology changes.

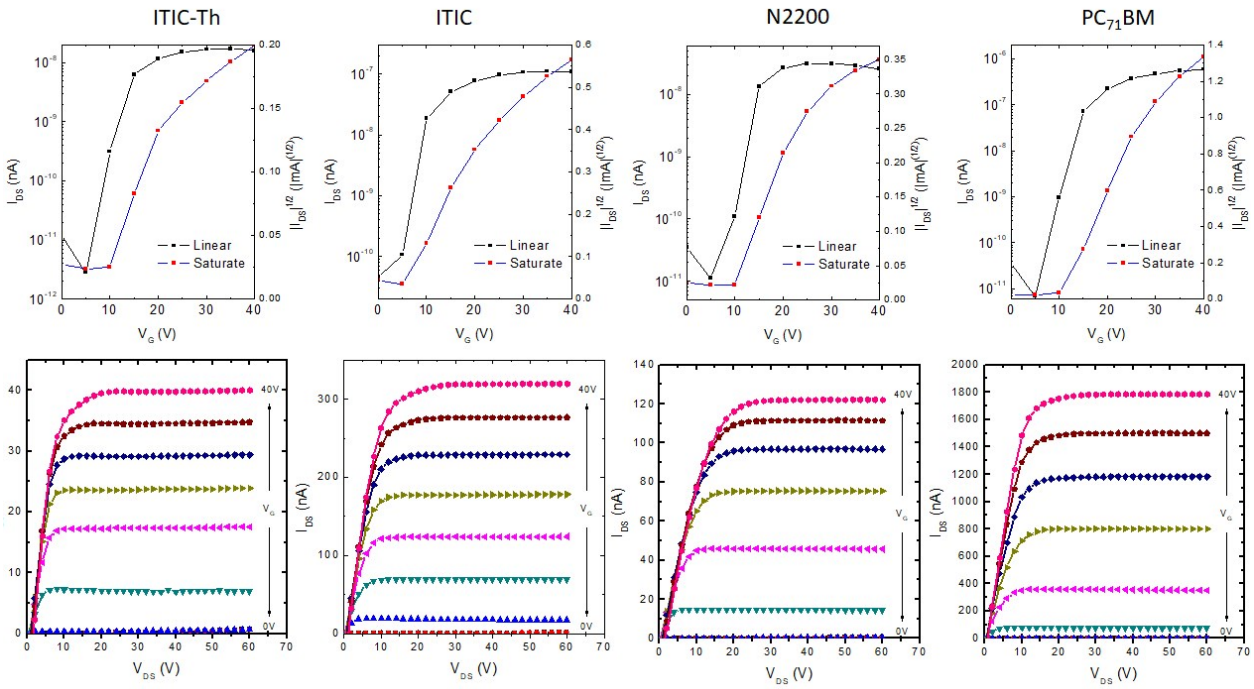

Figure S6. Transfer and output characteristics of **ITIC-Th**, **ITIC**, **N2200** and **$PC_{71}BM$** without the use of **PDIN** as the electron injection layer

Table S1. Electronic properties of **ITIC-Th**, **ITIC**, **N2200** and **$PC_{71}BM$** without the use of **PDIN** as the electron injection layer

Sample	μ_{lin} ($cm^2V^{-1}s^{-1}$)	μ_{sat} ($cm^2V^{-1}s^{-1}$)	V_T (V)	$I_{on/off}$	N_t (10^{10} cm^{-2})
ITIC-Th	1.1×10^{-4}	1.9×10^{-4}	7.5	6×10^3	15
ITIC	5.4×10^{-4}	7.8×10^{-4}	3.5	2.5×10^3	9
N2200	2.7×10^{-4}	6.1×10^{-4}	8.8	2.8×10^3	16.6
$PC_{71}BM$	2.8×10^{-3}	5.6×10^{-3}	9.8	8.9×10^4	10.5

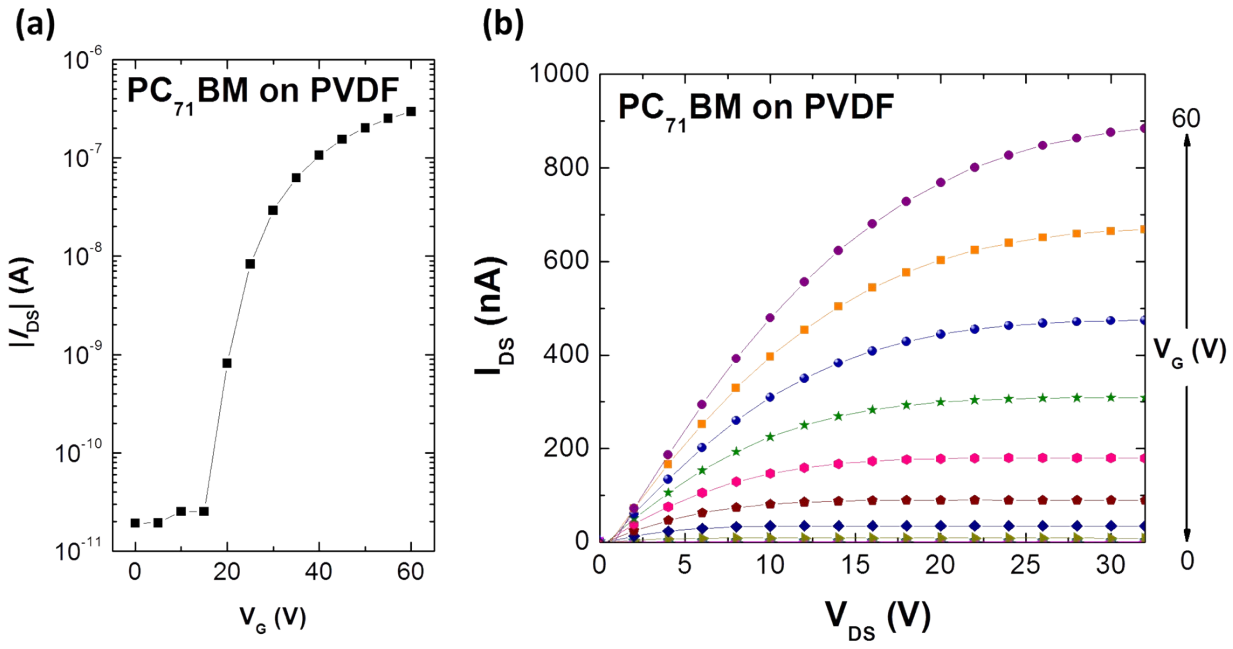

Figure S7. (a) Transfer and **(b)** output characteristic of **$PC_{71}BM$** n-type transistor employing **PVDF** as gate dielectric.

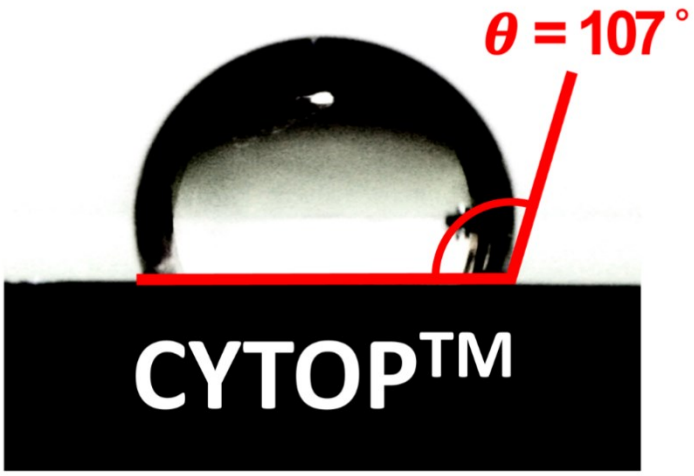

Figure S8. Water contact angle of CYTOP™-treated SiO_2 surface.