

# Molecular Doping of CVD-Graphene Surfaces by Perfluoroalkyl-Substituted Perylene Diimides Derivatives

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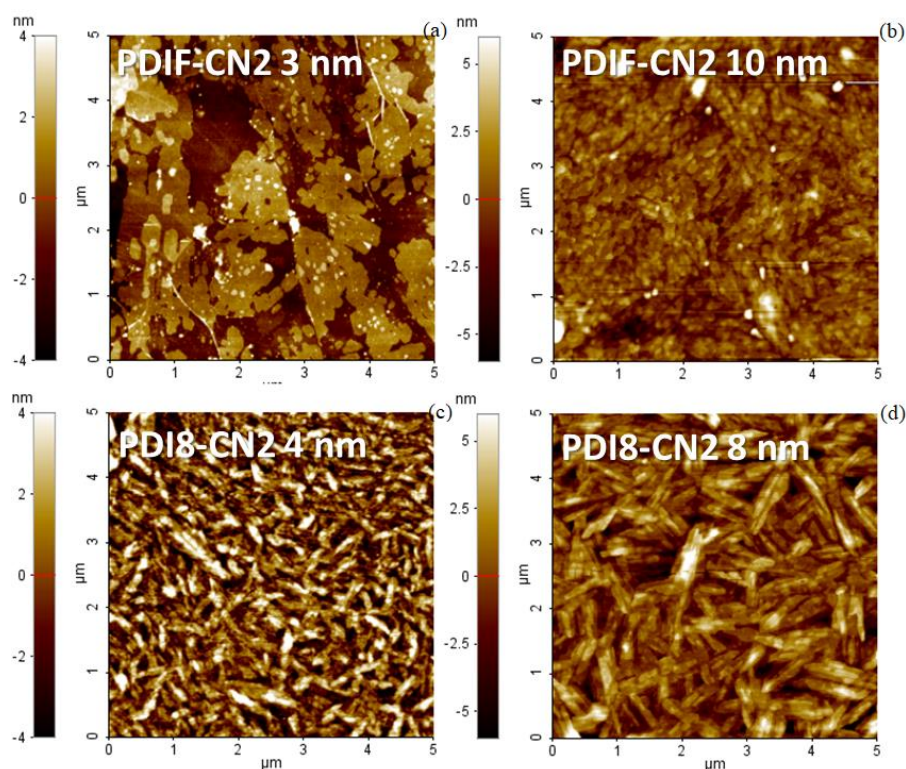
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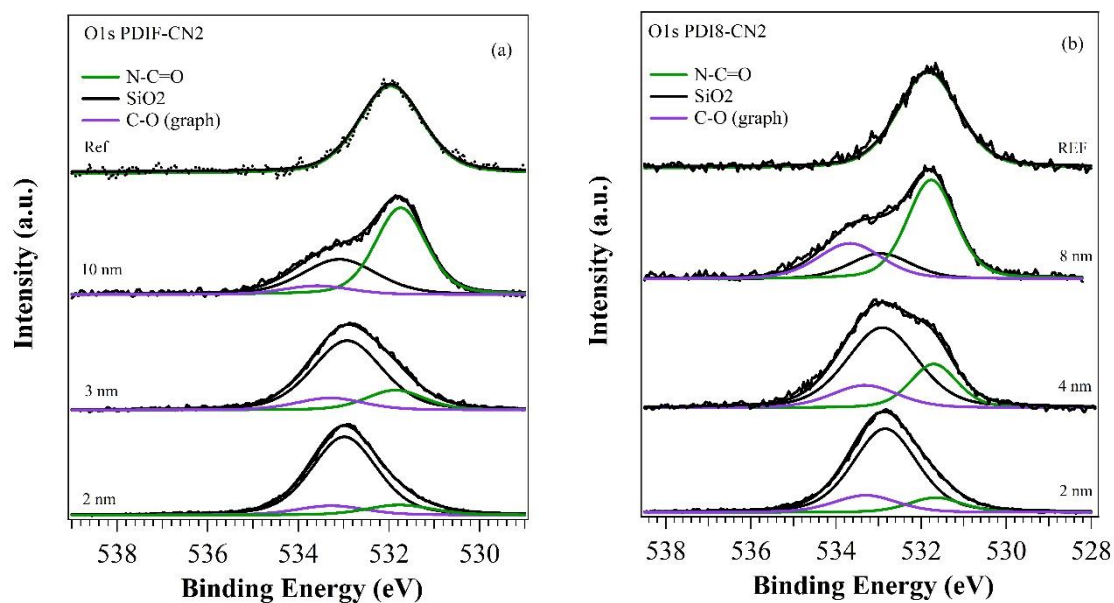
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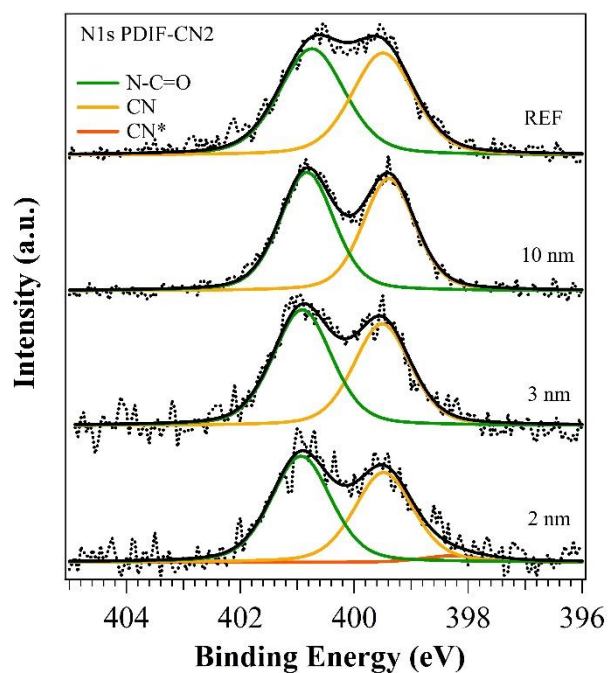
## Supplementary Materials



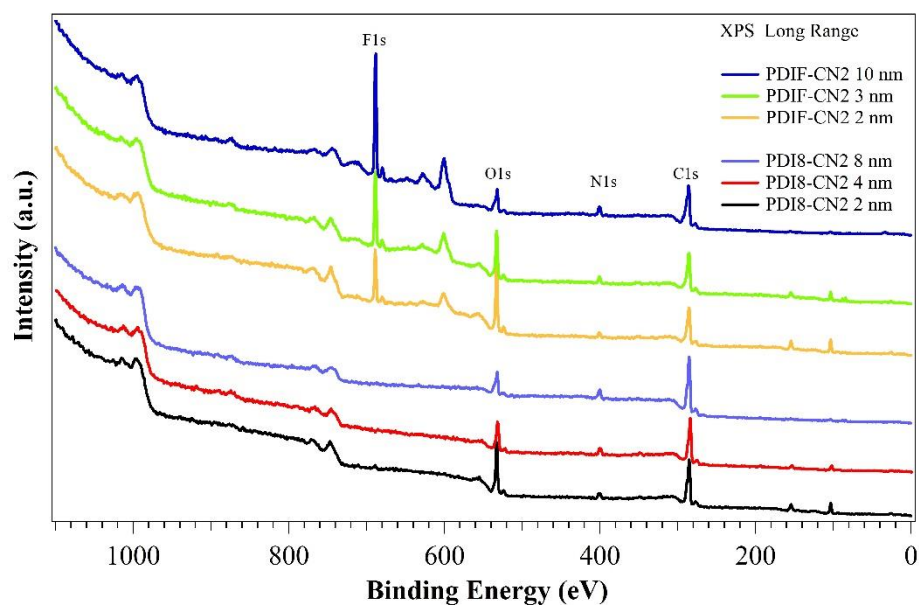
**Figure S1.** NC-AFM topography of PDI8-CN2(c–d) and PDIF-CN2 (a–b) grown on CVD-Graphene for different nominal thin film thicknesses.



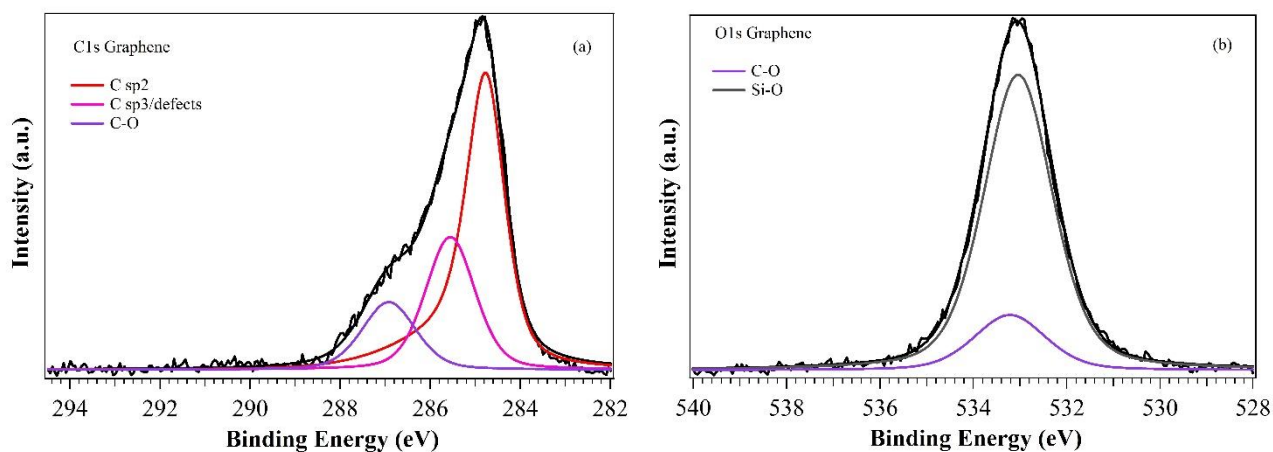
**Figure S2.** XPS O1s core levels spectra for (a) PDIF-CN2 and (b) PDI8-CN2 thin films grown on CVD-Graphene substrates.



**Figure S3.** XPS N1s core level spectra for PDIF-CN2 thin film grown on CVD-Graphene substrates.



**Figure S4.** Long Range XPS spectra of PDI8-CN2 and PDIF-CN2 films grown on graphene substrate and at various thicknesses.



**Figure S5.** (a) C1s and (b) O1s core level spectra of the graphene substrate.

PDIF-CN2	2nm		3nm		10nm	
C1s	BE [eV]	FWHM [eV]	BE [ev]	FWHM [eV]	BE [eV]	FWHM [eV]
C-C	285.61	1.55	285.69	1.60	285.47	1.60
CON	288.75	1.50	288.69	1.55	288.56	1.50
CN	286.56	1.50	286.64	1.50	286.42	1.50
CF2	290.86	1.38	291.01	1.40	290.80	1.41
CF3	293.42	1.20	293.5	1.22	293.26	1.00
Graph C=C	284.70	1.00	284.65	1.01	284.78	1.06
Graph. sp <sup>3</sup>	285.50	1.22	285.43	1.15	285.60	1.16
Graph. Ox.	286.85	1.48	286.80	1.47	286.93	1.40
O1s						
SiO <sub>2</sub>	532.98	1.70	532.91	1.88	533.25	1.97
O in mol	531.76	1.71	531.91	1.55	531.74	1.32
Graph O	533.27	1.78	533.2	1.75	533.35	1.75
N1s						
CN*	398.28	1.22	-		-	
CN	399.48	1.22	399.51	1.19	399.39	1.1
N-CO	400.93	1.24	400.91	1.22	400.83	1.16
F1s						
CF <sub>3</sub>	688.36	1.65	688.28	1.53	688.14	1.53
CF <sub>2</sub>	689.06	1.85	689.09	1.67	688.89	1.70

Table S1. Details of core levels deconvolution (BE position and FWHM) for PDIF-CN2 films with thicknesses of 2 nm, 3 nm and 10 nm.

<b>PDI8-CN2</b>		<b>2nm</b>		<b>4nm</b>		<b>8nm</b>
<b>C1s</b>	BE [eV]	FWHM [eV]	BE [eV]	FWHM [eV]	BE [eV]	FWHM [eV]
C=C arom	284.36	1.00	284.42	1.00	284.34	1.00
C-C chain	285.74	1.30	285.80	1.25	285.60	1.30
C-H ring	284.82	1.00	284.88	1.05	284.75	1.10
CON	288.51	1.35	288.57	1.45	288.53	1.35
CN	286.76	1.25	286.82	1.30	286.78	1.25
Other C	286.31	1.20	286.37	1.35	286.33	1.25
Graph C=C	284.79	1.10	284.72	1.05	284.92	1.10
Graph. sp3	285.57	1.23	285.46	1.16	285.7	1.23
Graph ox.	286.94	1.45	286.87	1.45	287.07	1.40
<b>O1s</b>						
SiO <sub>2</sub>	532.84	1.78	533.11	2.20	533.34	2.06
O in mol	531.66	1.50	531.8	1.30	531.76	1.41
Graph O	533.30	1.75	533.10	2.00	533.47	1.83
<b>N1s</b>						
CN*	398.25	1.20	-	-	-	-
CN	399.43	1.15	399.34	1.17	399.42	1.21
N-CO	400.70	1.14	400.64	1.15	400.69	1.20

Table S2. Details of core levels deconvolution (BE position and FWHM) for PDI8-CN2 films with thicknesses of 2 nm, 4 nm and 10 nm