Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Substrate-Dependent Resistance Decrease of Graphene by Ultraviolet-Ozone Charge Doping

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Table S1. Summarized literature results of the effect of UVO treatment on the resistance of graphene.

1	Substrates	UV light		Ozone	Resistance [Ω/□] after UVO exposure					Work function [eV]
		Wavelength [nm]	Intensity [mW/cm^2]		0 min	3 min	5 min	10 min	>10 min	
1 [1]	-	-	-	Yes	Metal to insulator					-
2 [2]	Si/SiO_2	254	20	Yes	464	5354	∞	∞	∞	-
3 [3]	Si/SiO_2	254	-	Yes	2000	-	-	3000	9000	-
4 [4]	Si/SiO_2	254	-	Yes	90[a]	110[a]	-	-	-	-
5[5]	Si/SiO_2	-	-	Yes	350	-	-	400	420	4.9 to 4.83
6[6]	Si/SiO_2	254	-	Yes	3800	-	-	1000	800	-
7 [7]	Glass/ITO	-	30	Yes	1000	1500	3000	∞	∞	4.3 to 4.85
8 [8]	Si/SiO_2	220	11	No	~9000				-	-
9 [9]	Si/SiO_2	365	-	No	-[b]				-	-
10 [10]	Ga/N	325	50 E-10^5	No	4 E-6 to 2 E-4 [c]				-	-

[a] Unit in Ω/□; [b] μ_{hole}=~1200 cm^2/V·s, $\mu_{electron}$=~760 cm^2/V·s; [c] the current value in A.

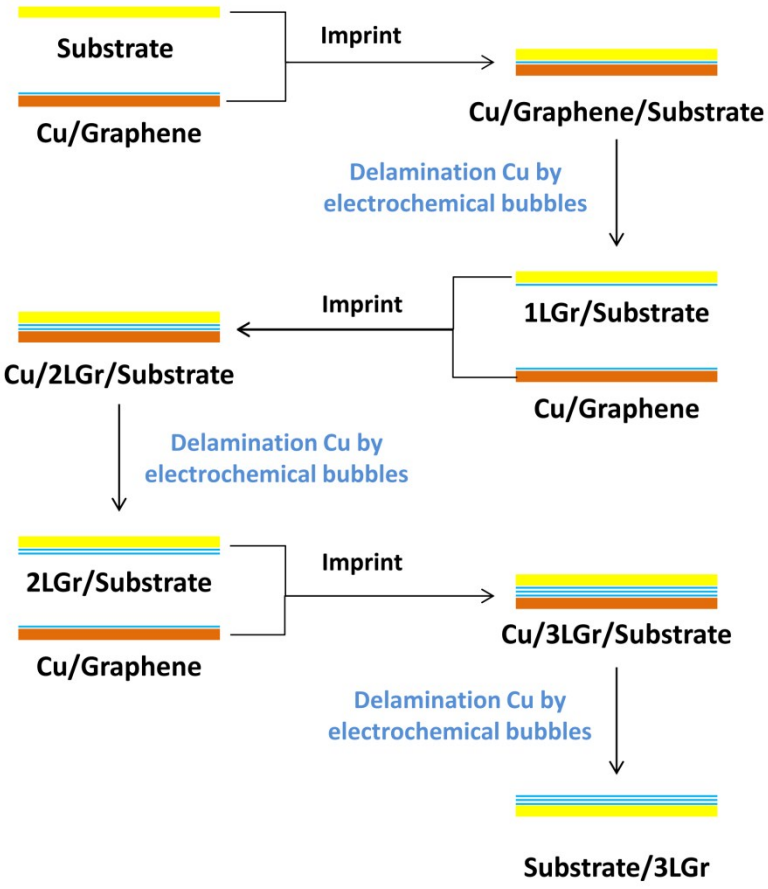

Figure S1 Direct transfer of multilayer graphene on PTFE and paraffin film by the imprint and electrochemical bubbling delamiantion methods.

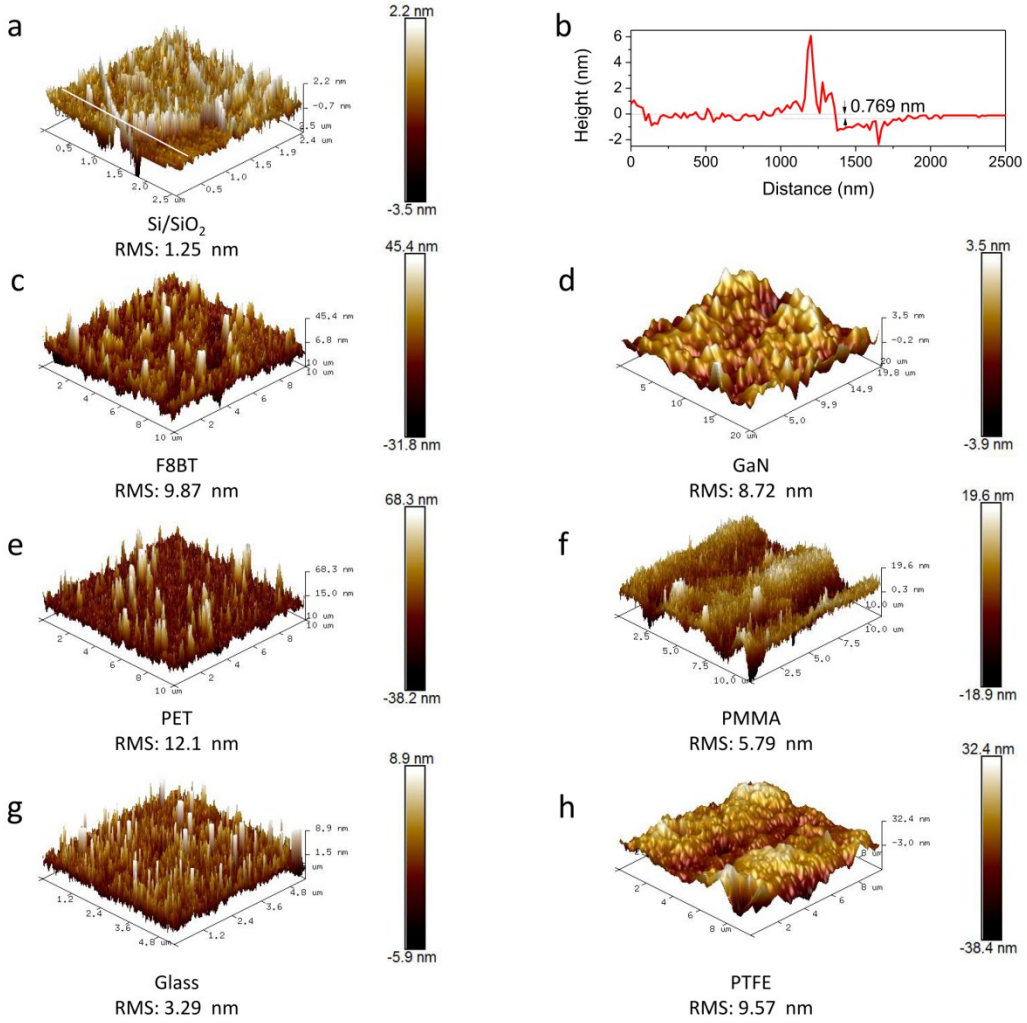

Figure S2 AFM images and roughness values for graphene on different substrates. Figure b is the surface profile of graphene on Si/SiO_2, the thickness of the one-time transferred graphene is 0.769 nm.

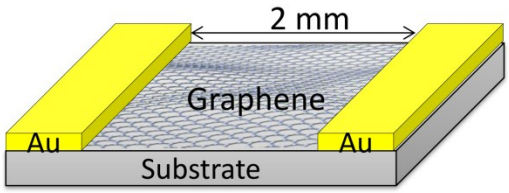

Figure S3 Schematic of the graphene device for the resistance test on different substrates. The distance between the two Au electrodes is 2 mm and the width of graphene is 1 mm.

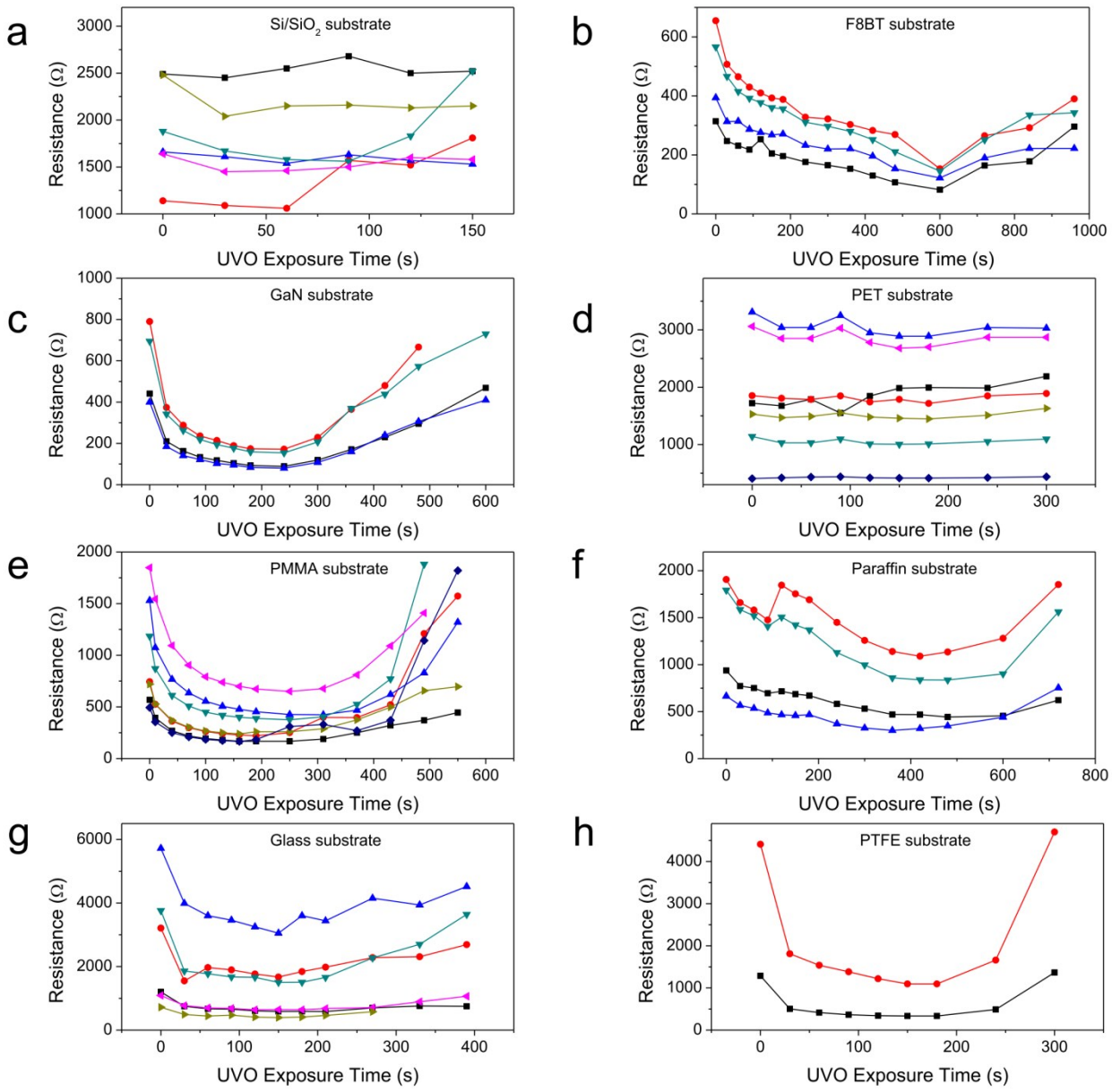

Figure S4 Resistance change of graphene on different substrates using UVO treatment. (a) Monolayer graphene transferred to Si/SiO_2 substrate. (b) Monolayer graphene on F8BT film. (c) Monolayer graphene transferred to GaN substrate. (d) Monolayer graphene transferred to PET substrate. (e) Monolayer graphene on PMMA/PET substrate. (f) Multilayer (two layers) graphene on a paraffin film. (g) Monolayer graphene transferred to glass substrate. (g) Multilayer (three layers) graphene on a PTFE film.

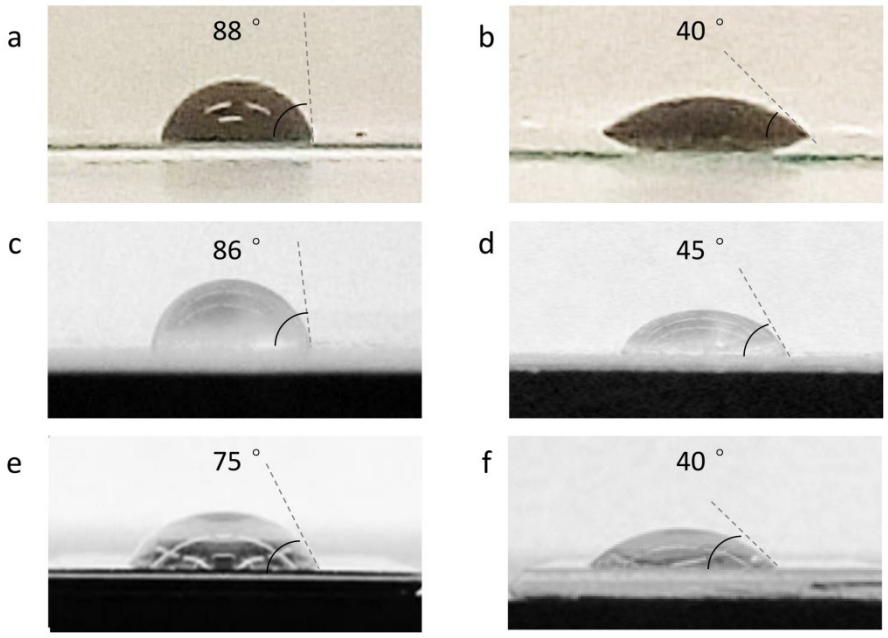

Figure S5 Water contact angles for graphene films (a) and (b) on PET substrate before and after UVO treatment; (c) and (d) on glass substrate before and after UVO treatment; (e) and (f) on Si/SiO2 substrate before and after UVO treatment.

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