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Supporting Information for

Interface Engineering for Efficient and Stable Chemical-Doping-Free Graphene-on-Silicon Solar Cell by Introducing a Graphene Oxide Interlayer

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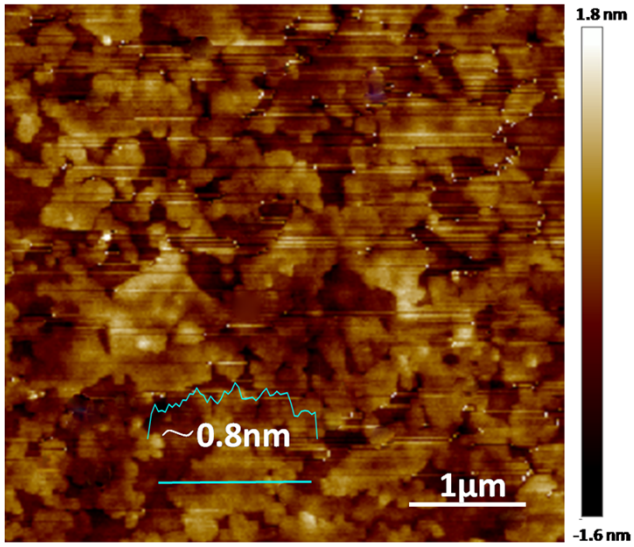

Figure S1 AFM image of GO film deposited by one LBL assembling cycle on Si surface and the corresponding height profile of the GO film.

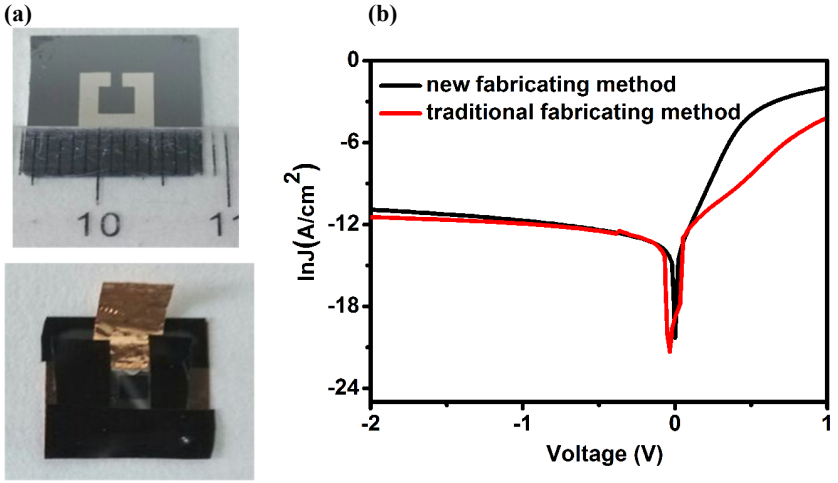

Figure S2 (a) Photographs of Gr/GO/Si solar cell sample before and after encapsulation. (b) Dark J-V characteristics in the semi logarithmic scale of solar cells fabricated by the usual and our new fabricating method.

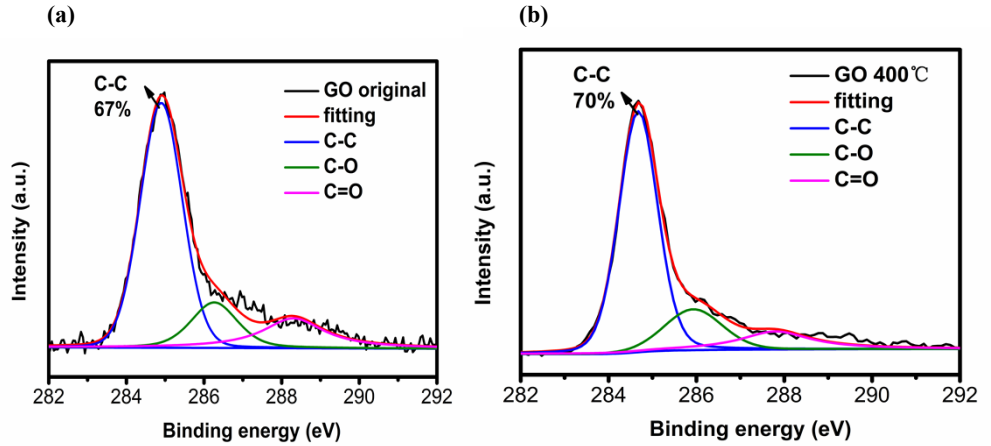

Figure S3 X-ray photoelectron spectra (XPS) of GO film: (a) as-deposited by drop casting method, (b) after one hour heat treatment at 400℃ under forming gas.

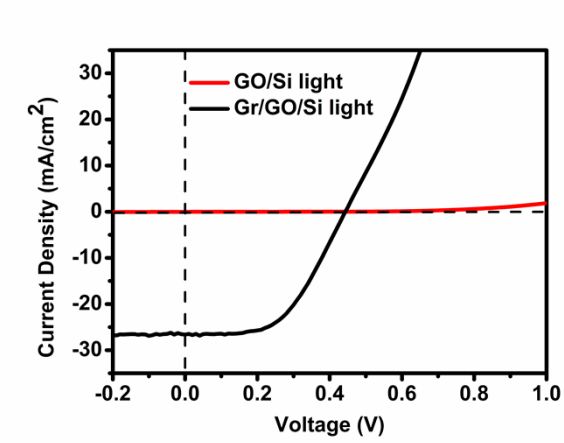

Figure S4. J-V characteristics of a GO/Si device and a Gr/GO/Si device under light illumination.

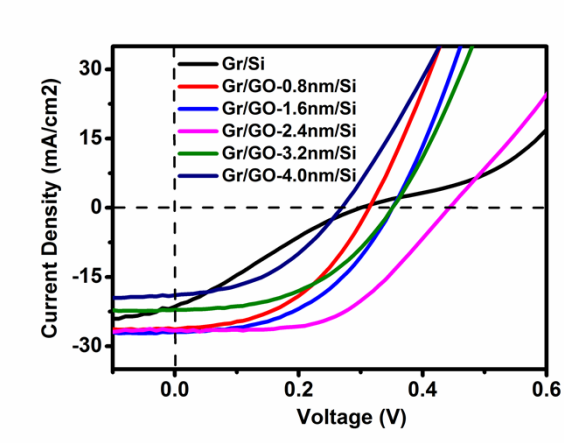

Figure S5 J-V characteristics of typical Gr/Si and Gr/GO/Si solar cells with different GO interlayer thickness.

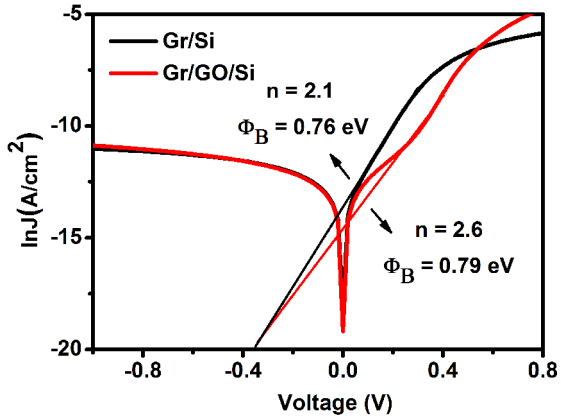

Figure S6 Dark J-V characteristics in the semi logarithmic scale and corresponding extracted n and ϕ_B of typical Gr/GO/Si (2.4nm thick GO interlayer) and Gr/Si solar cells.

Table S1 Photovoltaic properties of typical Gr/Si and Gr/GO/Si solar cells with different GO interlayer thickness.

Samples	J_{SC} (mA/cm^2)	V_{OC} (V)	FF	Eff. (%)	Rs (Ω·cm^2)
Gr/Si	21.4	0.31	0.24	1.57	2.1
Gr/GO-0.8nm/Si	26.9	0.32	0.44	3.82	3.4
Gr/GO-1.6nm/Si	26.5	0.36	0.47	4.49	4.8
Gr/GO-2.4nm/Si	26.6	0.45	0.52	6.18	7.7
Gr/GO-3.2nm/Si	21.8	0.36	0.38	2.87	12.5
Gr/GO-4.0nm/Si	18.9	0.28	0.34	1.80	16.2

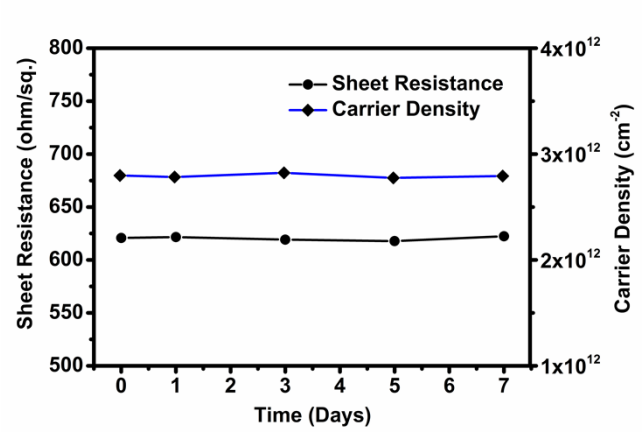

Figure S7 The evolution of sheet resistance and carrier density of a typical Gr sample with storing time.

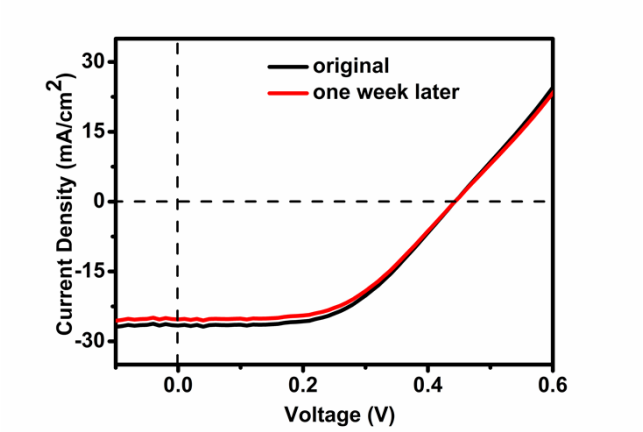

Figure S8 J-V characteristics of a Gr/GO/Si solar cell measured originally and one week later.