

Supplementary Information

Tailoring Quantum Transport Efficiency in Molecular Junctions via Doping of Graphene Electrodes

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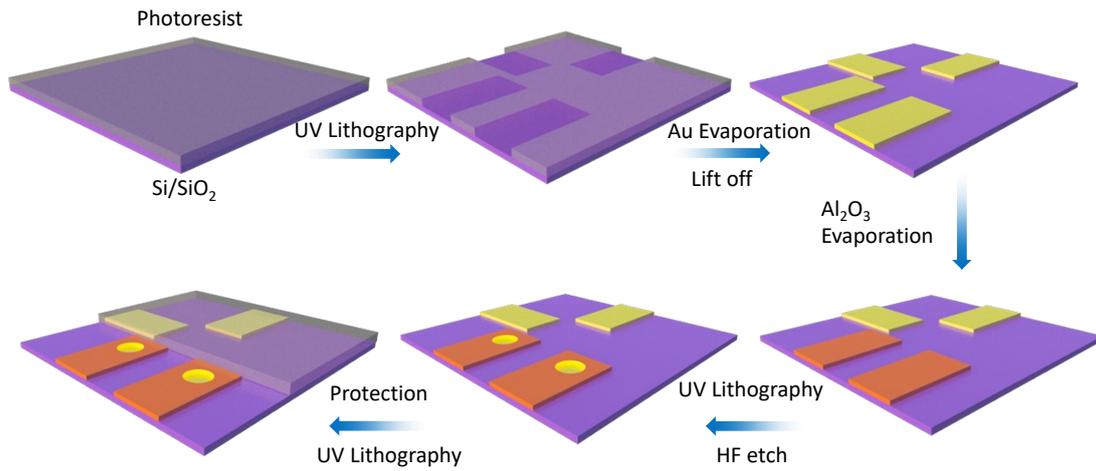


Figure S1. Flow chart of micro-well device fabrication.

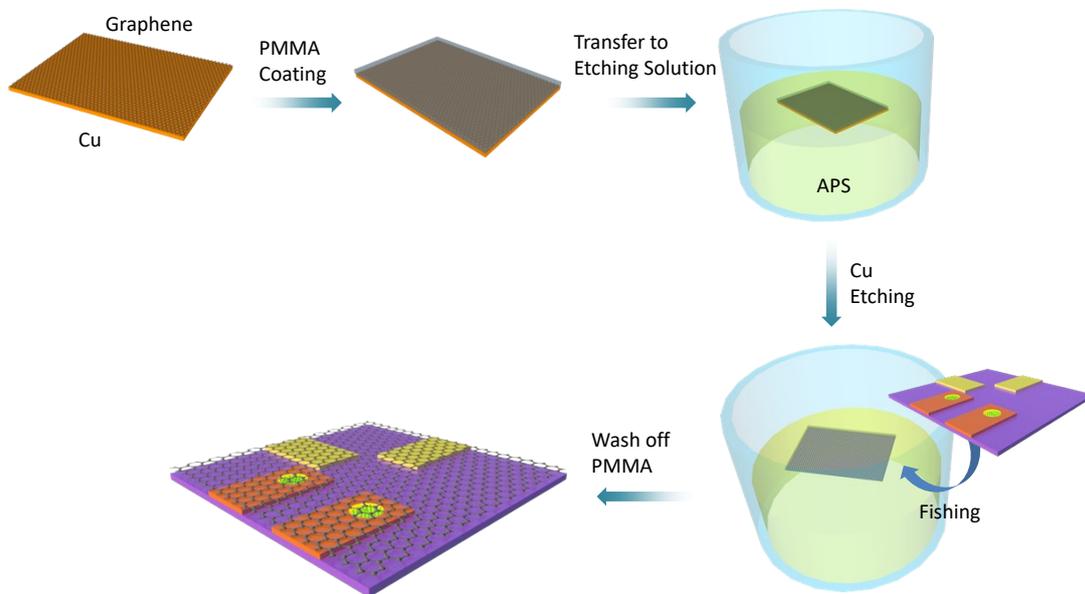


Figure S2. Flow chart of transferring graphene on top of a micro-well device

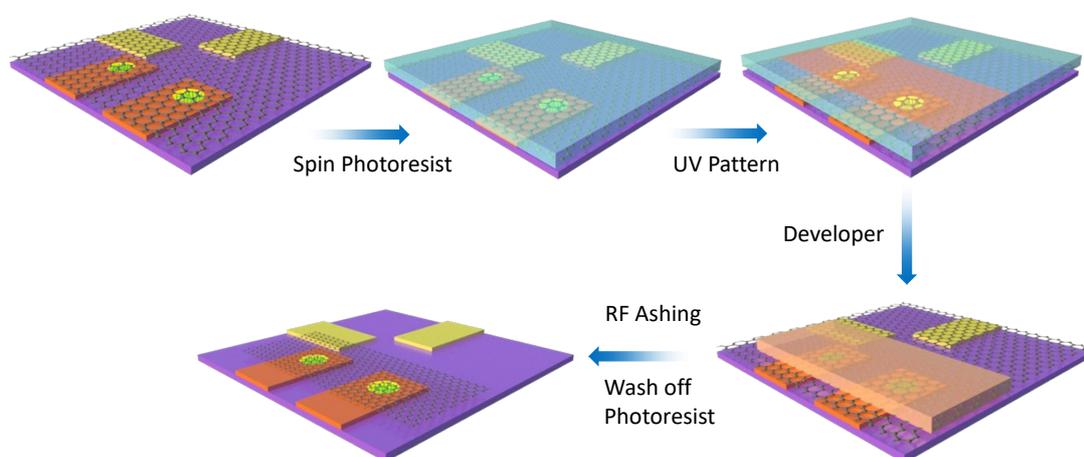


Figure S3. Flow chart of etching off unwanted graphene parts

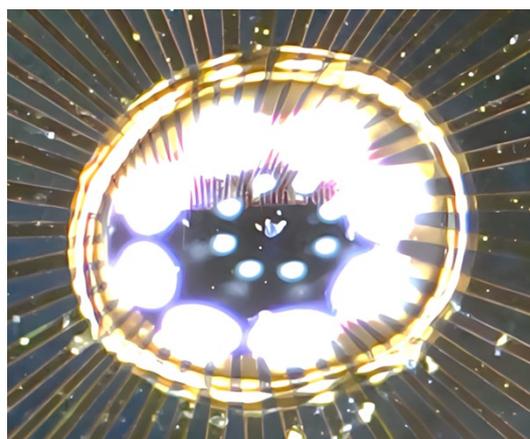


Figure S4. Microscopic picture of graphene covered device before (left) and after (right) ionic liquid dropping

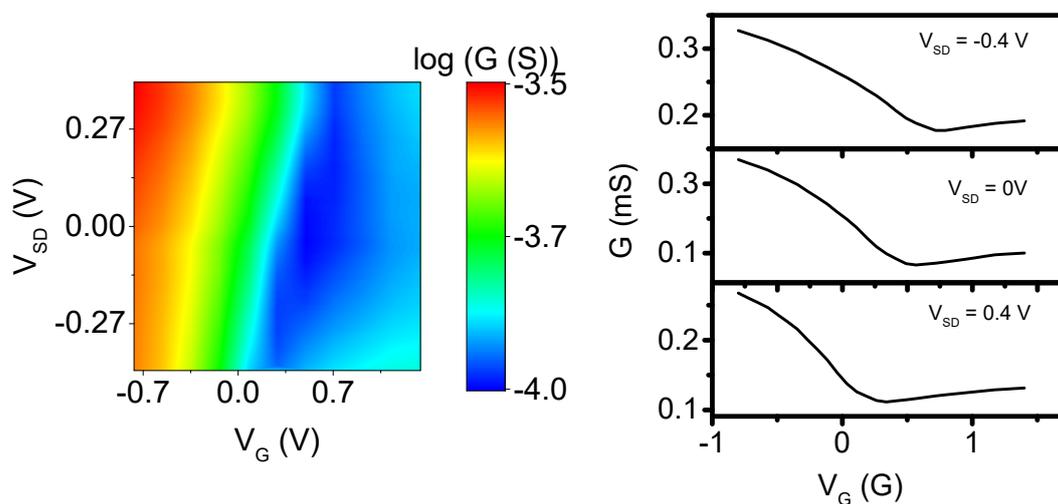


Figure S5. Graphene (before doping) conductance behavior vs. gate voltage, result indicate the graphene used in this work was p-doped.

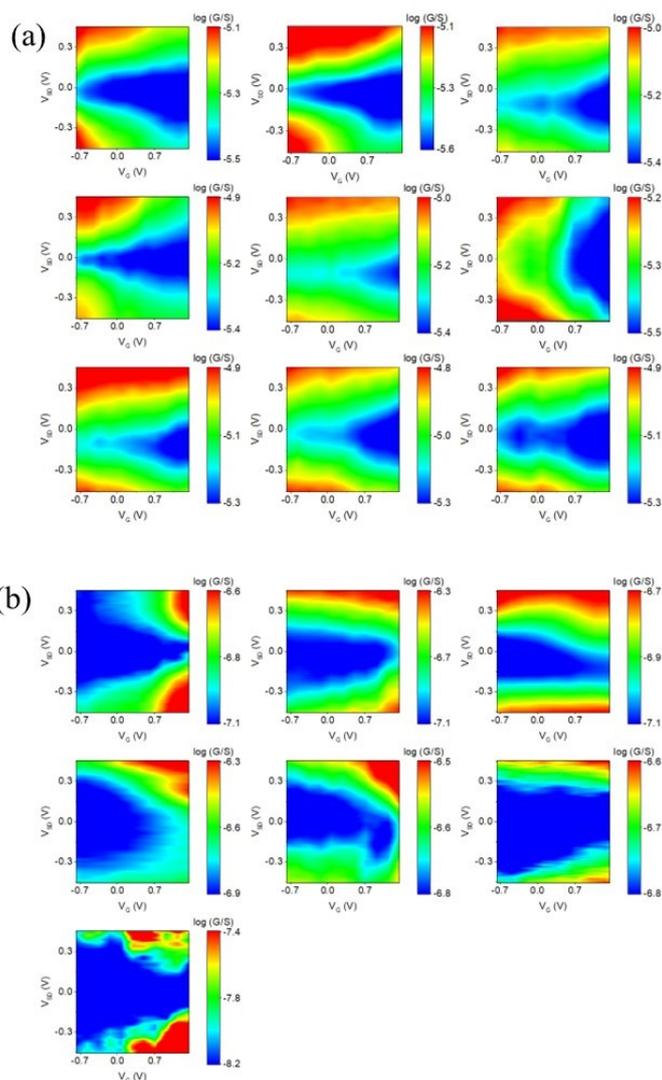


Figure S6. Gating behavior of SAM1 and SAM2 junction, which confirmed junction 1 is HOMO dominated and junction 2 is LUMO dominated.

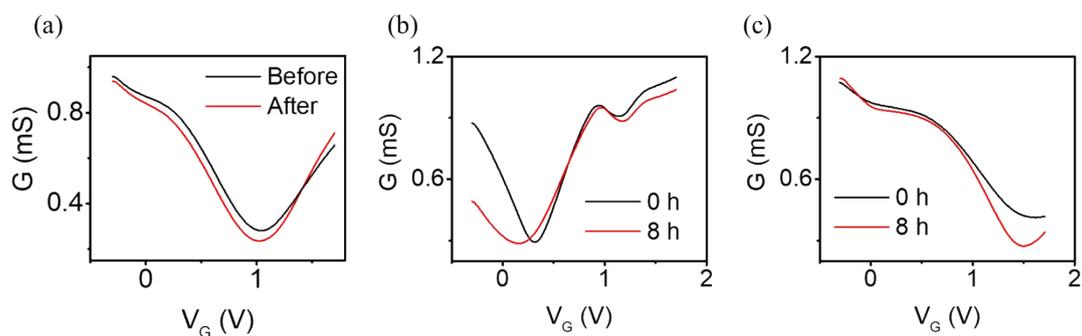


Figure S7. GV curves for non-doped graphene gated with an ionic liquid (a) before (black) and after (red) immersion in a DMF solution, and the GV curves for graphene doped with dopant 1 (b) and dopant 2 (c) immediately after the ionic liquid was dropped (black) and 8 hours after the drop (red).

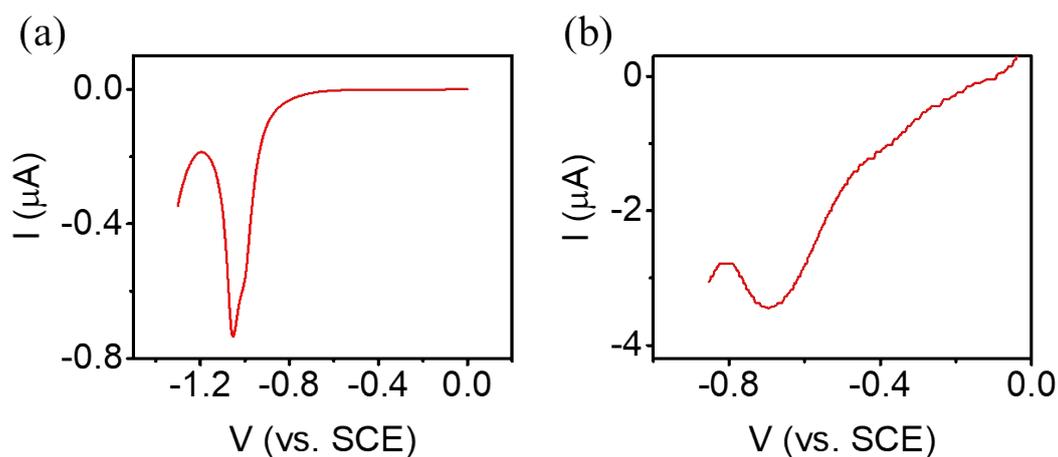


Figure S8. The reductive desorption of SAMs 1 (a) and 2 (b) in 1M NaOH solution.

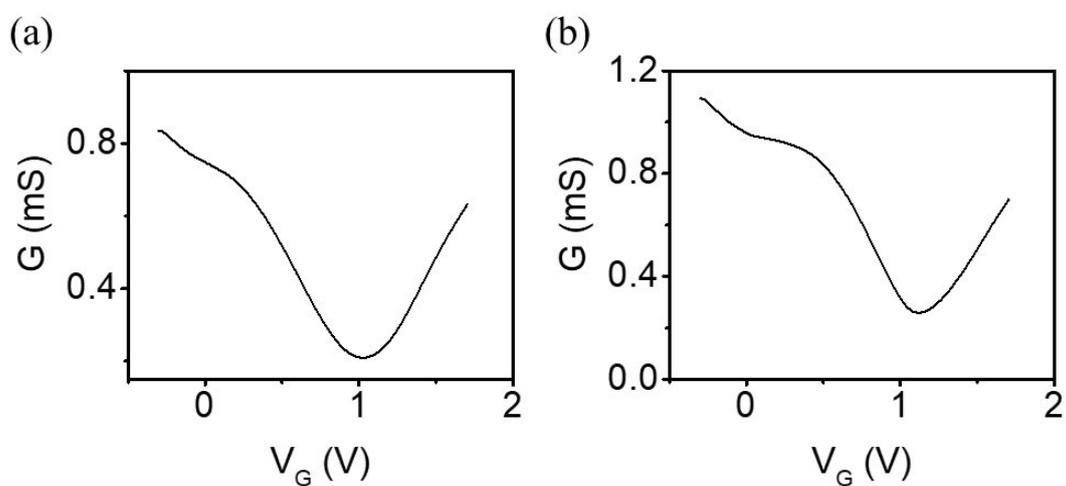


Figure S9. GV curves for non-doped graphene gated with ionic liquid while graphene was transferred on SAMs 1 (a) and 2 (b).

Table S1 The surviving rate of measured junctions.

SAMs	Measured Junction	Survive Junction	Survival Rate
1	68	49	72%
1 ^a	23	21	91%
1 ^b	26	26	100%
2	68	37	55%
2 ^a	21	18	86%
2 ^b	16	14	88%

^a Junction after graphene doped with dopant 1, only survive SAMs junction were measured after doping.

^b Junction after graphene doped with dopant 2, only survive SAMs junction were measured after doping.

Table S2 Summary of the reductive desorption of SAMs **1** and **2**.

SAMs	E_d (V vs. SCE)	Q (C/cm²)	Packing density (mol/cm²)^a	Molecular occupation Area (Å²)
SAMs 1	-1.1	4.9E-05	5.1E-10	32
SAMs 2	-0.7	4.4E-05	1.1E-10	150

^a Packing density obtained via equation $Q/A = nF\Gamma$, F the Faraday's constant = 96500 C/mol, A the electrode area, n the number of electron transfer per molecular desorption, 1 for SAMs **1** and 4 for SAMs **2**.