Electronic Supplementary Material (ESI) for Nanoscale.
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Impact of oxygen plasma treatment on carrier transport and molecular adsorption in graphene

Supplementary Information

TABLE S1. Change in carrier mobility, carrier density, D, G peak intensity of Raman spectra, and calculated L_d of graphene following 2 to 14 s O_2 plasma treatments.

Time (s)	μ ($cm^2/V\cdot s$)	n_s (cm^{-2})	I_D	I_G	L_d (μm)
0	1.86×10^3	3.98×10^{12}	0.02	0.49	49.16
2	1.25×10^3	4.70×10^{12}	0.20	0.58	17.00
4	5.55×10^2	9.08×10^{12}	0.30	0.65	15.00
6	4.04×10^2	1.23×10^{13}	0.52	0.76	12.27
8	3.15×10^2	1.39×10^{13}	0.73	0.79	10.48
10	2.48×10^2	1.55×10^{13}	0.87	0.82	9.84
12	2.24×10^2	1.58×10^{13}	1.03	0.80	8.92
14	1.80×10^2	1.74×10^{13}	1.17	0.84	8.55

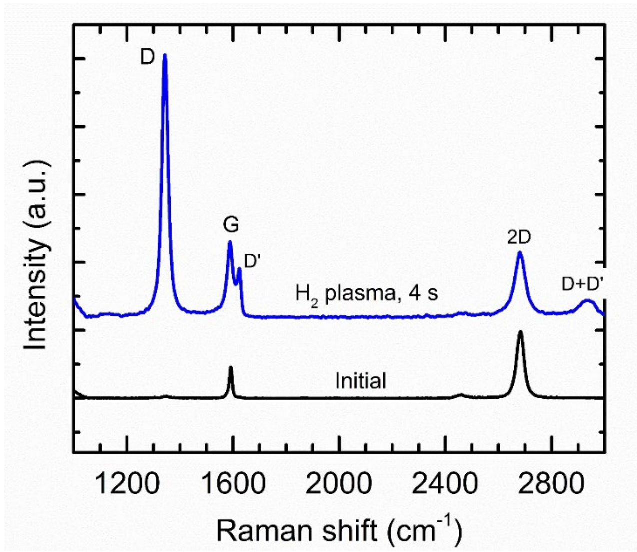

FIG. S1. Raman spectra of initial graphene (bottom) and H_2 plasma treated graphene for the duration of 4 s (top) are compared. From I_D/I_G of 3.5, the value of L_d after 4s of H_2 plasma treatment was determined to be 5.4 μm.

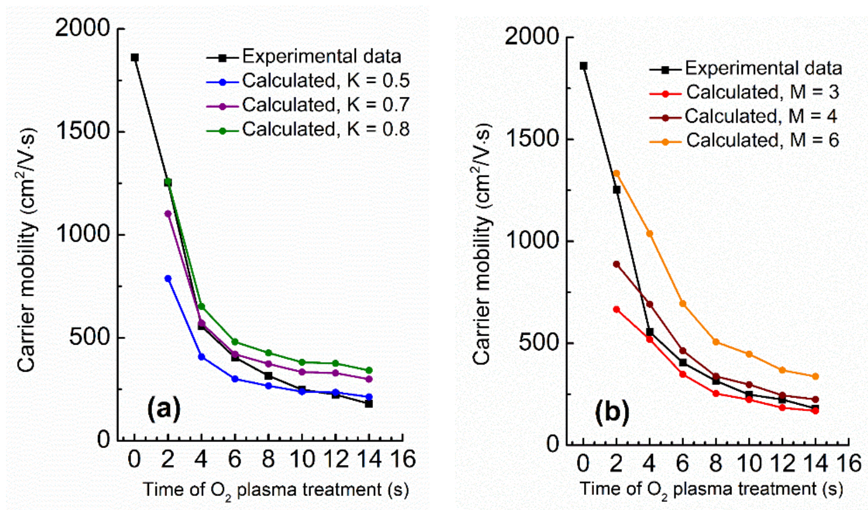

FIG. S2. Variation in the experimentally measured and calculated mobility as a function of O_2 plasma treatment time when only individual scattering mechanism is considered. We find that the impurity scattering model (a) agrees better for higher mobility side, while the short-range scattering model (b) fits better for lower mobility side, where stronger crystal lattice distortion can induce short-range scattering.