Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting information

Engineering work function of graphene oxide from p to n type using a low power atmospheric pressure plasma jet

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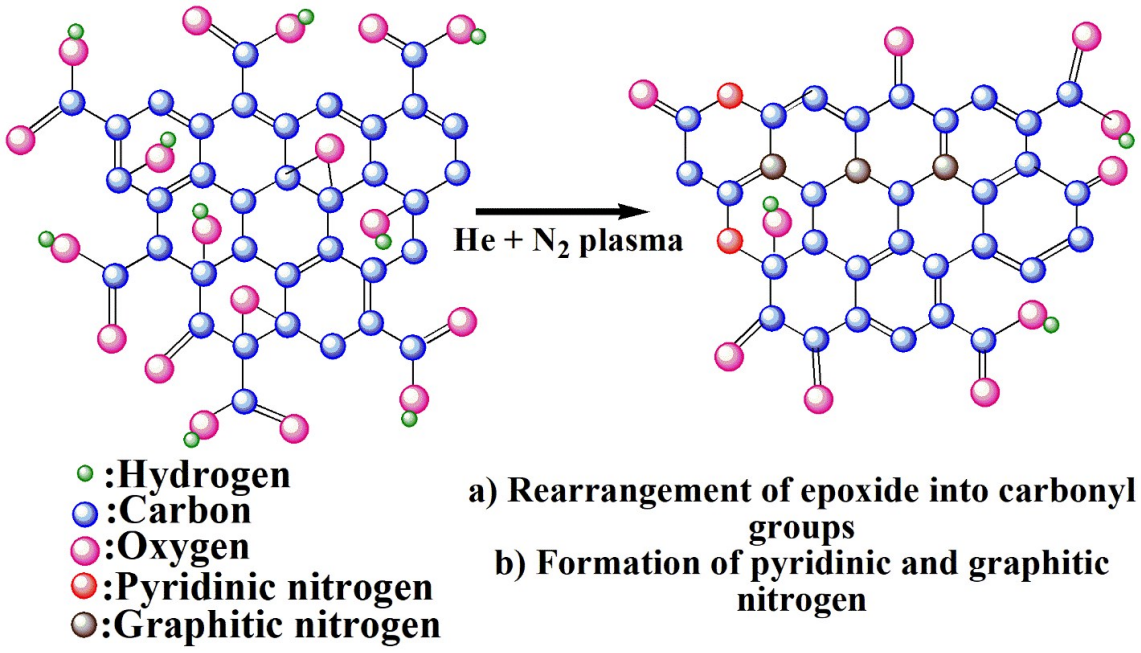

a) Rearrangement of epoxide into carbonyl groups
b) Formation of pyridinic and graphitic nitrogen

Figure S1. Nitrogen doping of GO films using $He^{+}N_2$ plasma jet. Structure on the right hand side shows the various configurations of doped nitrogen in the graphitic lattice.

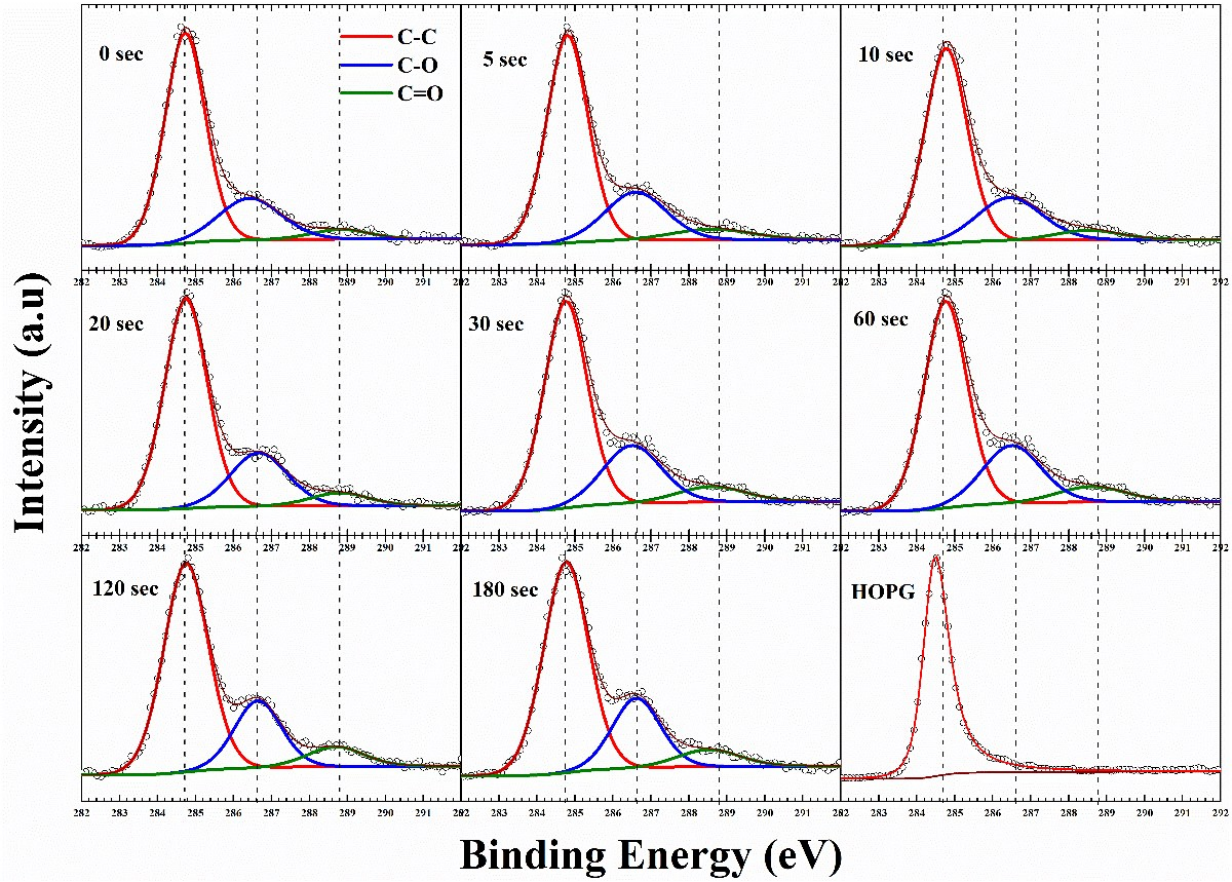

Figure S2. Fitted C1*s* spectra of GO, functionalized GO and HOPG. The peak intensities of all spectra have been normalized to one unit. C-C represents the carbon-carbon bonds, C-O represent carbon single bonded to oxygen and C=O represent carbon double bonded to oxygen.

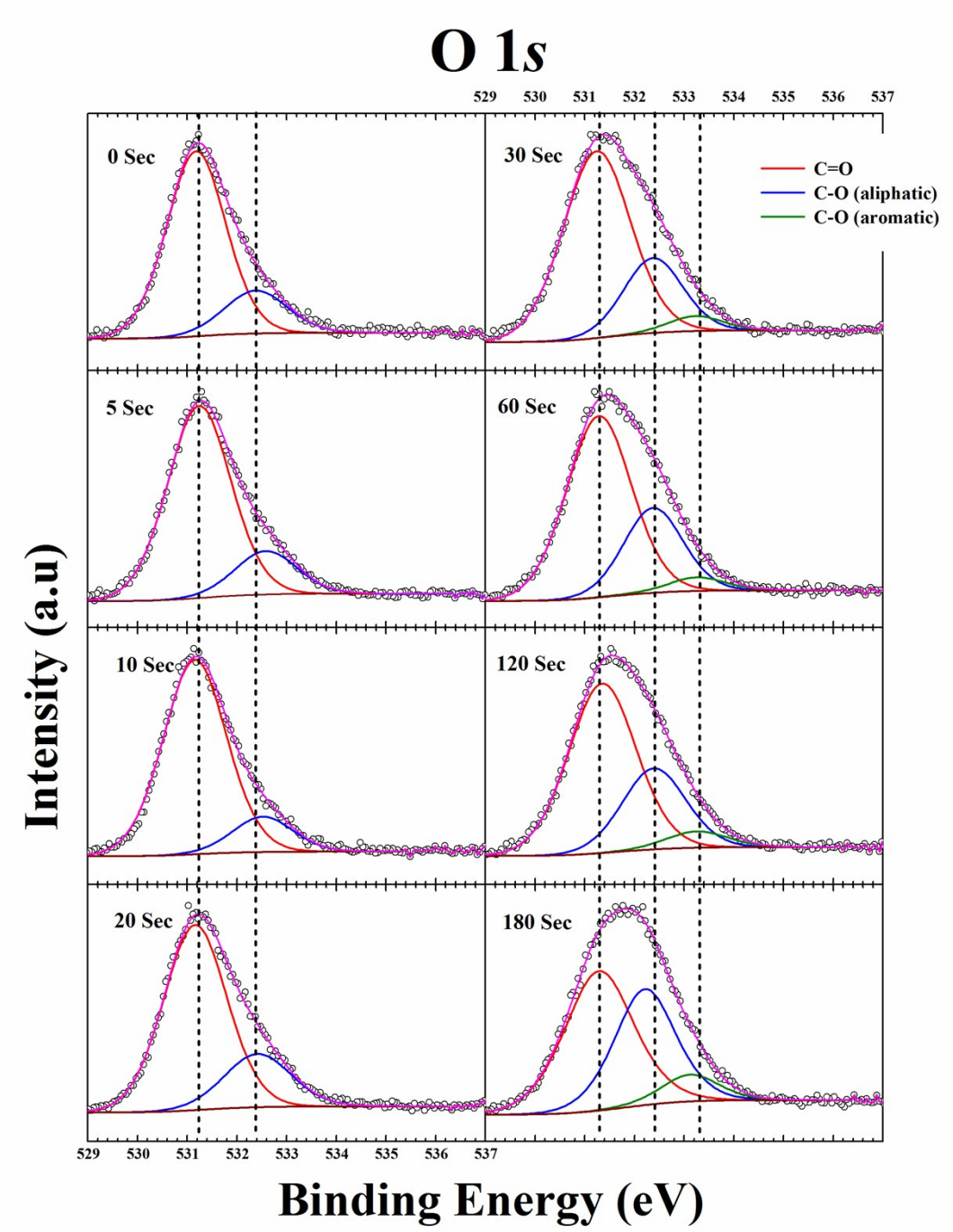

Figure S3. Fitted O1*s* spectra of GO (0 sec) and plasma functionalized GO for 5 to 180 seconds.

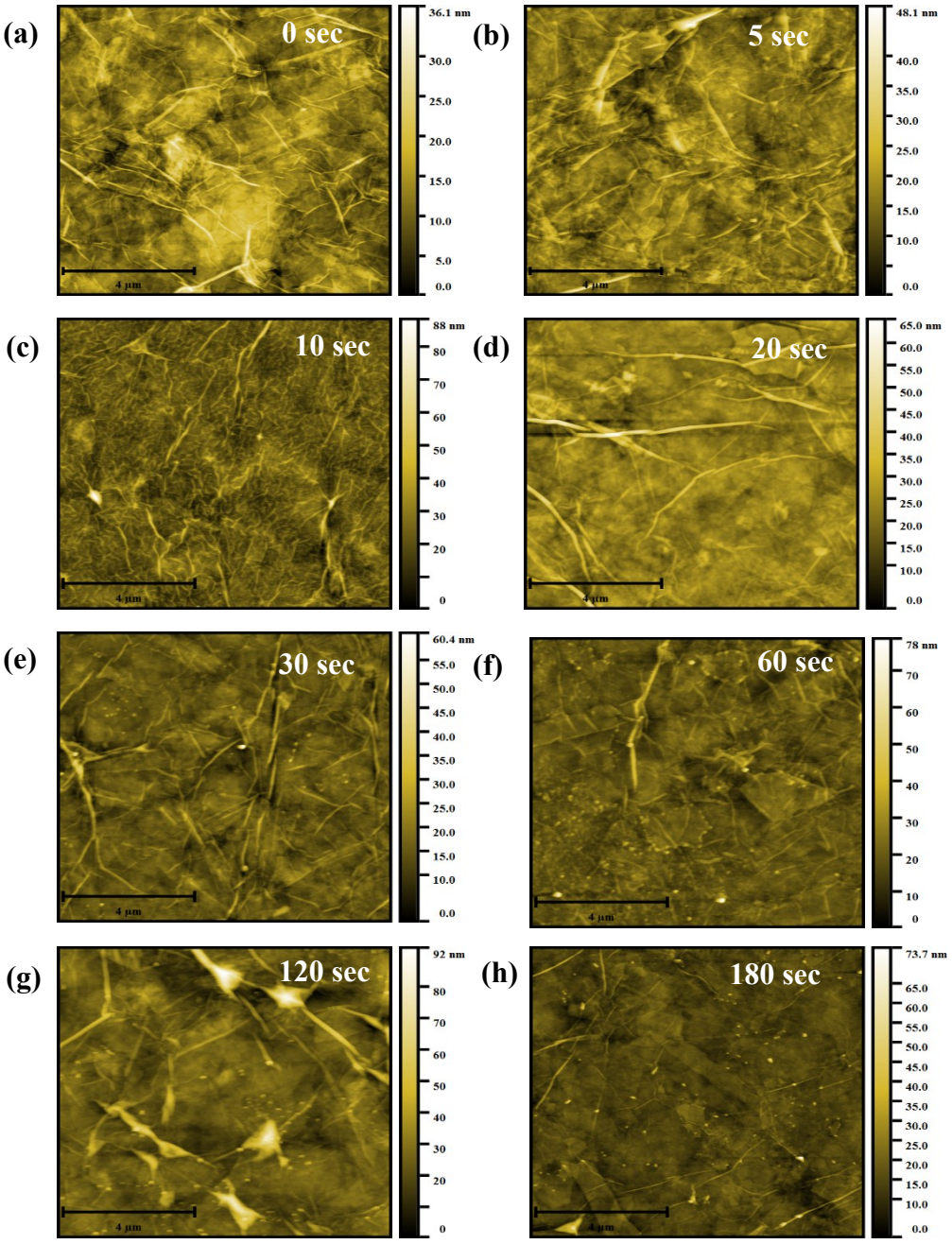

Figure S4. Tapping mode AFM height images of (a) drop-cast GO film, (b) to (h) plasma functionalized GO for varying time intervals. No substantial changes in surface roughness could

be observed form these height images. The average roughness value of all the samples were calculated to be 3±0.5 nm.

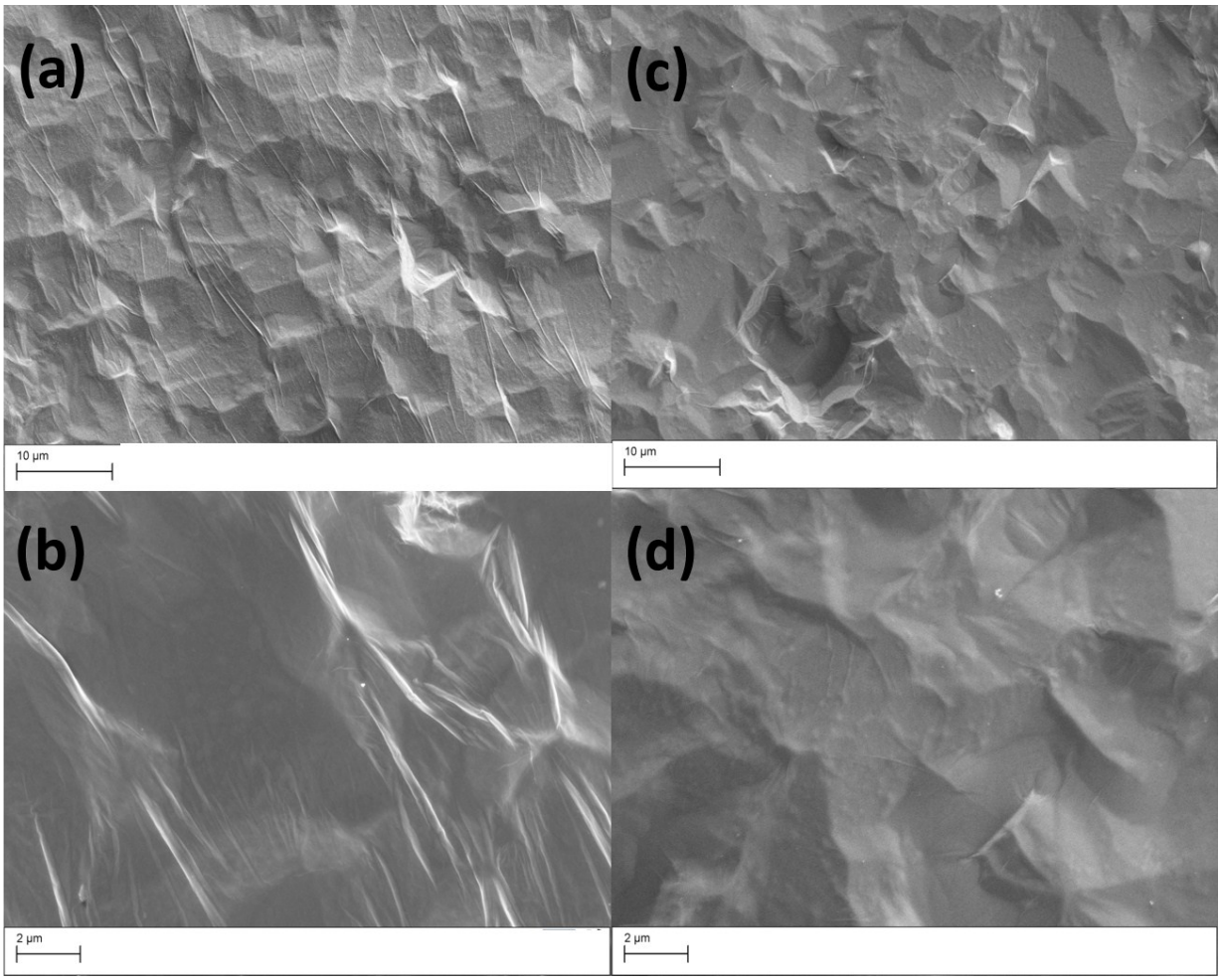

Figure S5. Scanning electron microscope images of (a),(b) as synthesised GO films and (c), (d) films plasma functionalised for 180 secs. The plasma functionalisation doesnot introduce morphological changes.

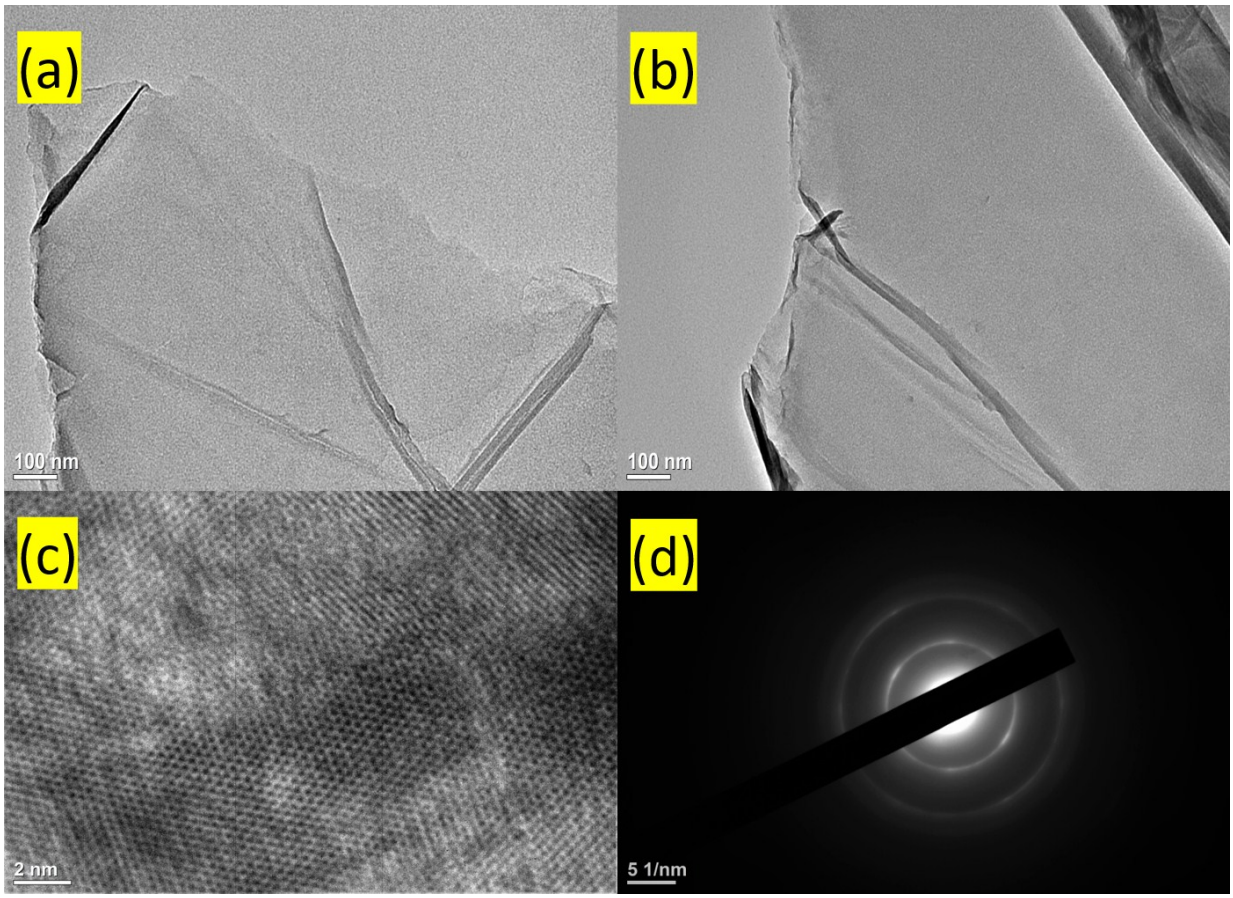

Figure S6. Transmission electron microscope images of (a),(b) as synthesised GO on lacey carbon grids, (c), high resolution image of exfoliated GO (d) Electron diffraction pattern from the GO film.