

Supporting Information

The use of sample positioning to control defect creation by oxygen plasma in isotopically labelled bilayer graphene membranes

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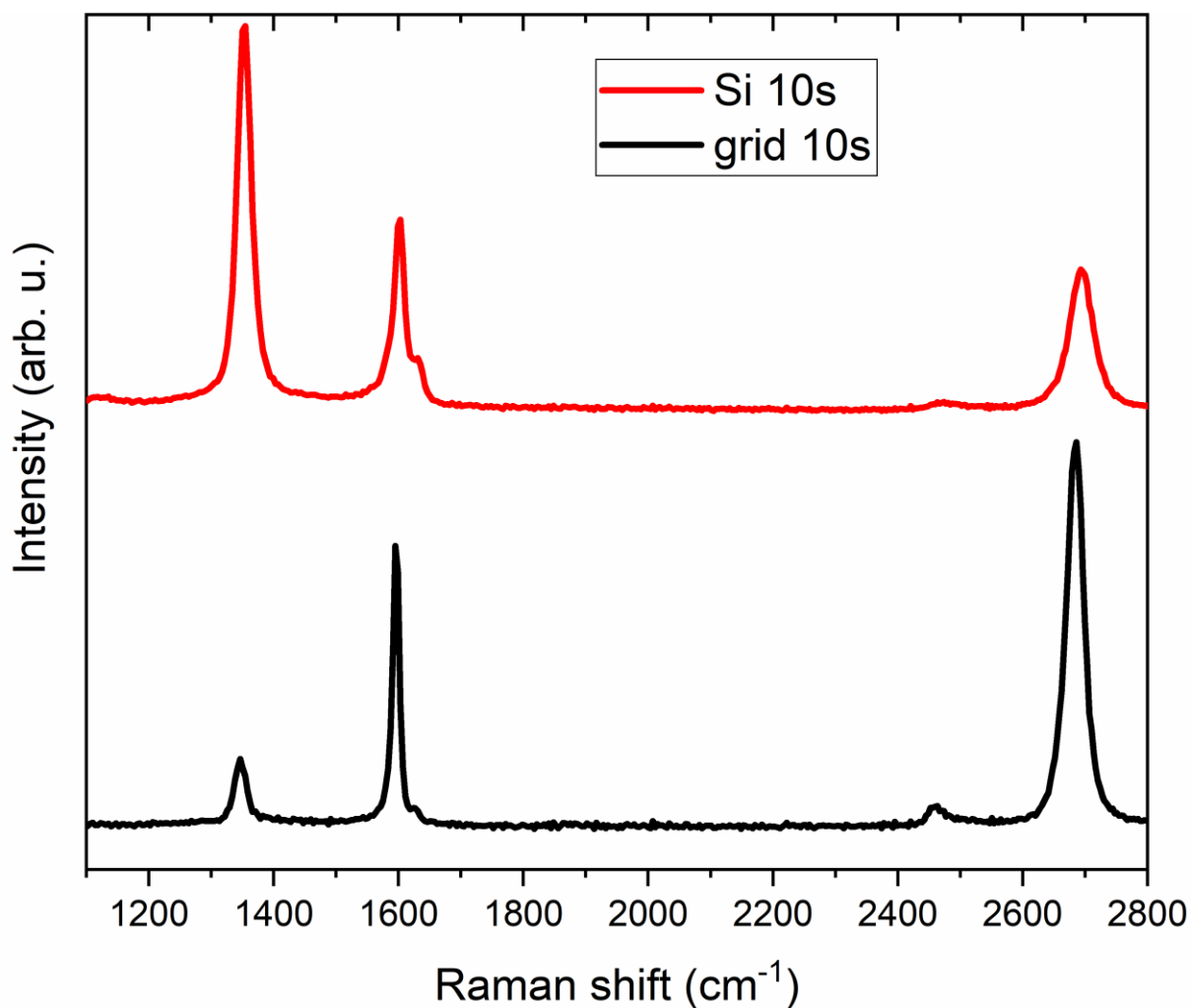


Figure S 1. Raman spectra of plasma-treated graphene (from ¹²C) suspended on a TEM grid (black line) and Si/SiO₂ substrate (red line). The samples were transferred on a gold TEM grid or Si/SiO₂ respectively and then treated for 10 seconds in the plasma chamber at 0.77 mbar and 35% power (350W). It is possible to see the typical G and 2D bands, at around 1595 cm⁻¹ and 2670 cm⁻¹, the D band located around 1350 cm⁻¹ and the D' around 1625 cm⁻¹.

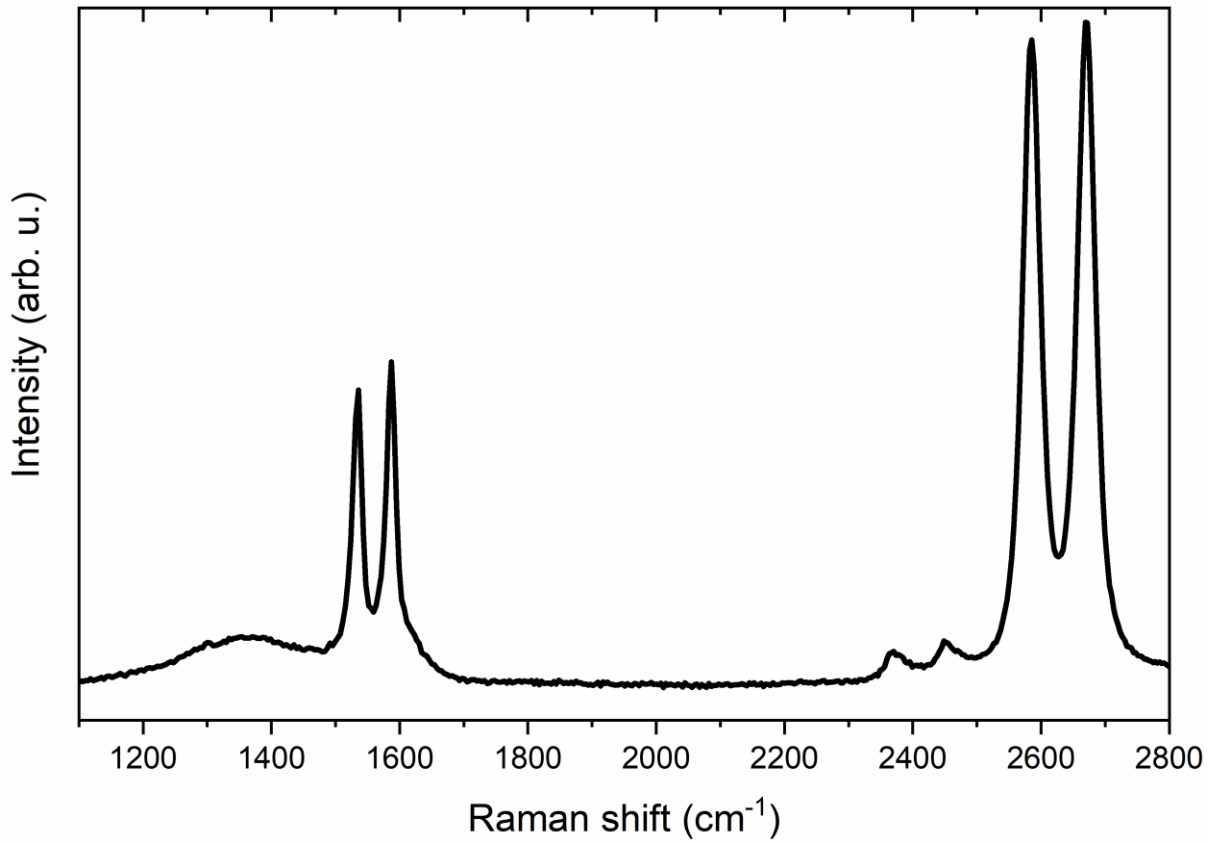


Figure S 2. Typical Raman spectrum of the bilayer graphene (¹²C+¹³C) deposited on the TEM grid before the plasma treatment. It is possible to see the typical G and 2D bands, at around 1595 cm⁻¹ and 2670 cm⁻¹ for ¹²C and around 1535 cm⁻¹, 2590 cm⁻¹ for ¹³C without the presence of the D band for both layers.

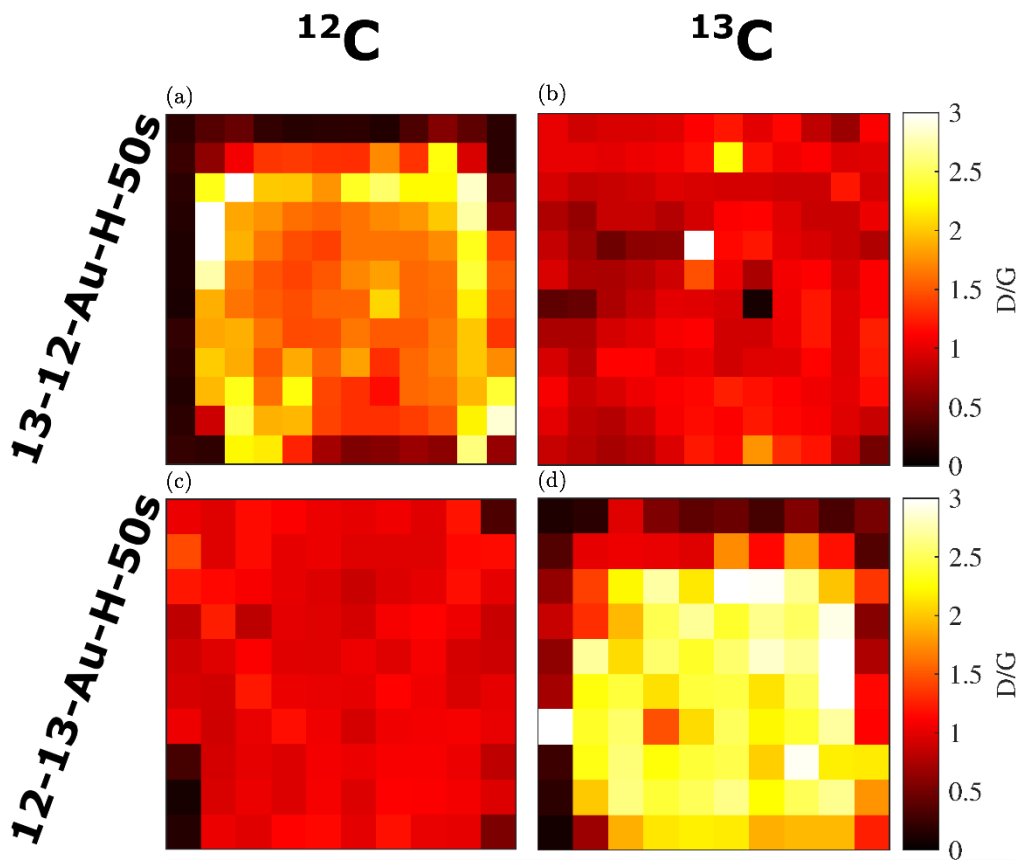


Figure S 3. Raman maps showing the uniformity of distribution of the D/G ratio. (a) and (b) refer to sample $^{13}\text{-}^{12}\text{-Au-H-50s}$, (c) and (d) refer to sample $^{12}\text{-}^{13}\text{-Au-H-50s}$. (a) and (c) show the data corresponding to the ^{12}C bands, (b) and (d) show the data corresponding to ^{13}C bands.

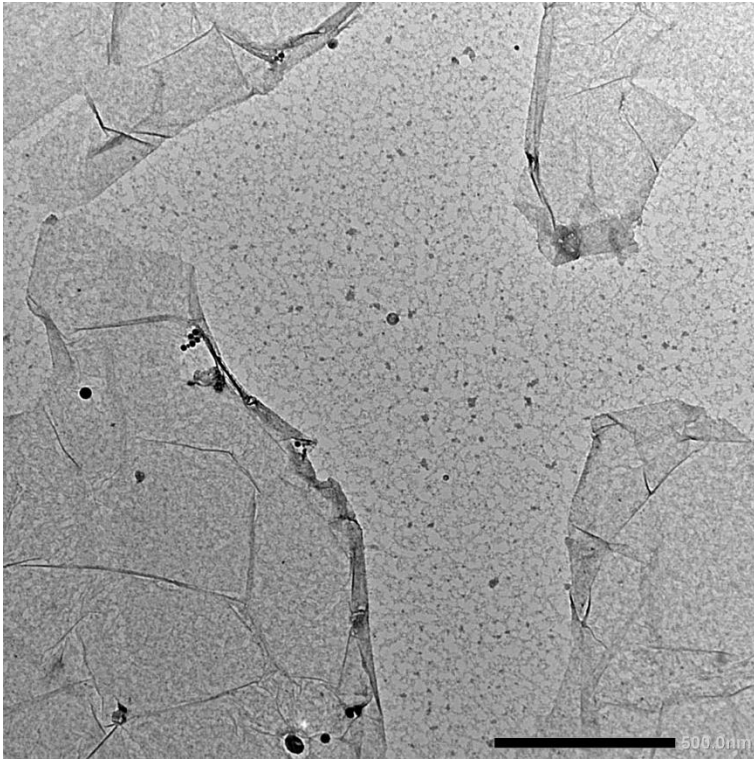


Figure S 4. HRTEM image of as-transferred bilayer graphene pointing out the difference in contrast between individual graphene layers (scale bar 500 nm).

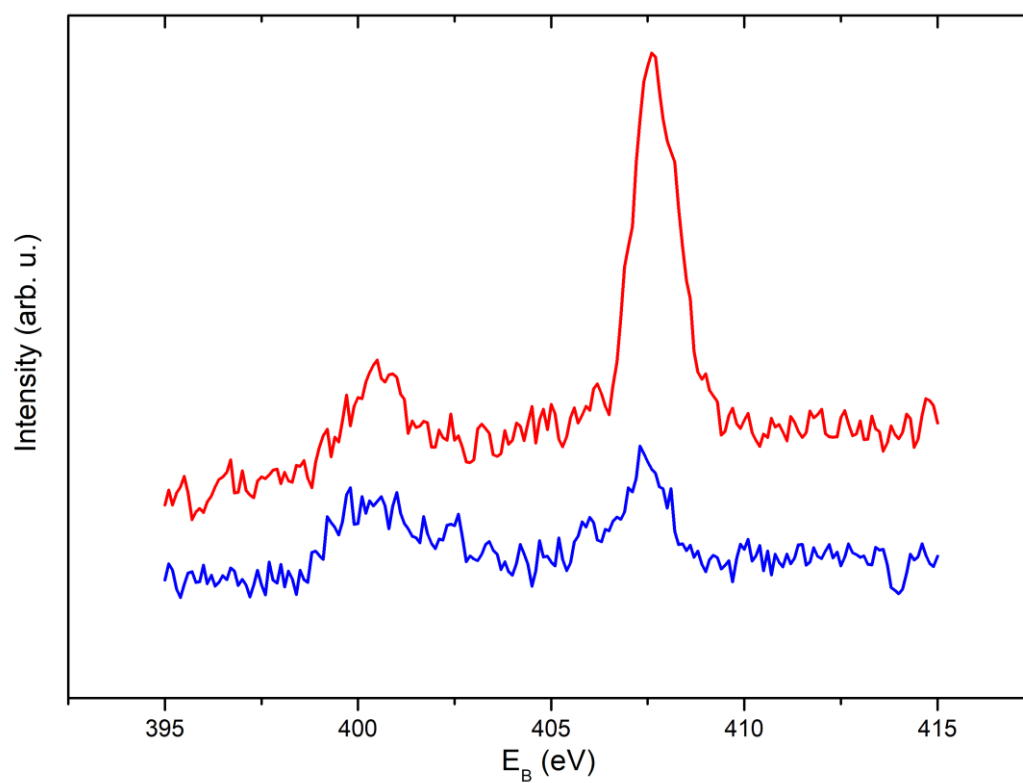


Figure S 5. Spectra of N 1s photoelectrons obtained for the sample **13-12-Au-H** before (red line) and after plasma treatment (blue line).