

# Supporting Information

for

## **Effect of the fluorination technique on the surface-fluorination patterning of double-walled carbon nanotubes**

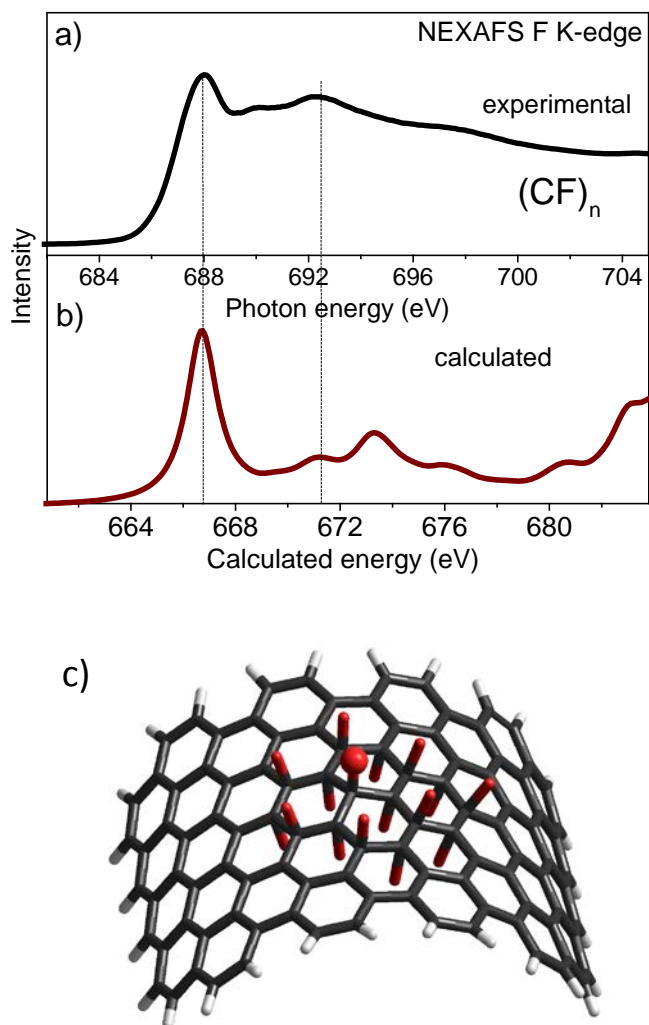
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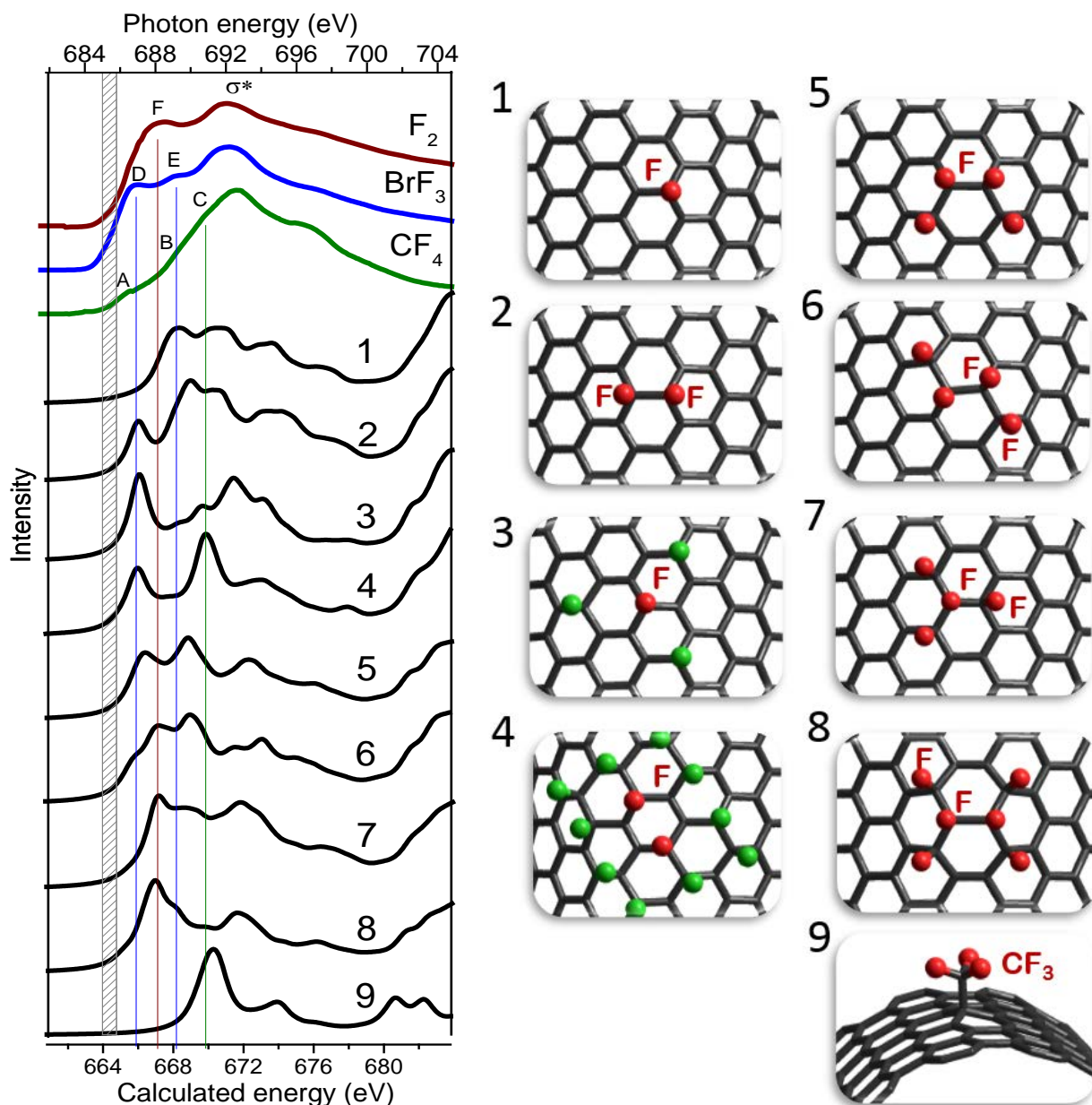
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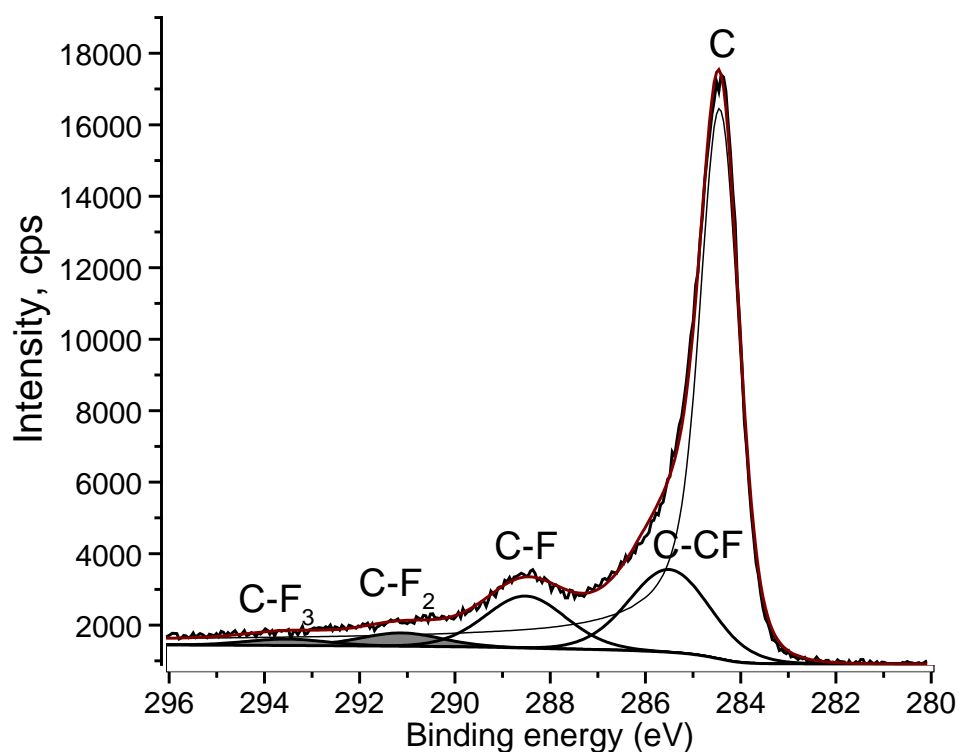
### **Additional experimental data**



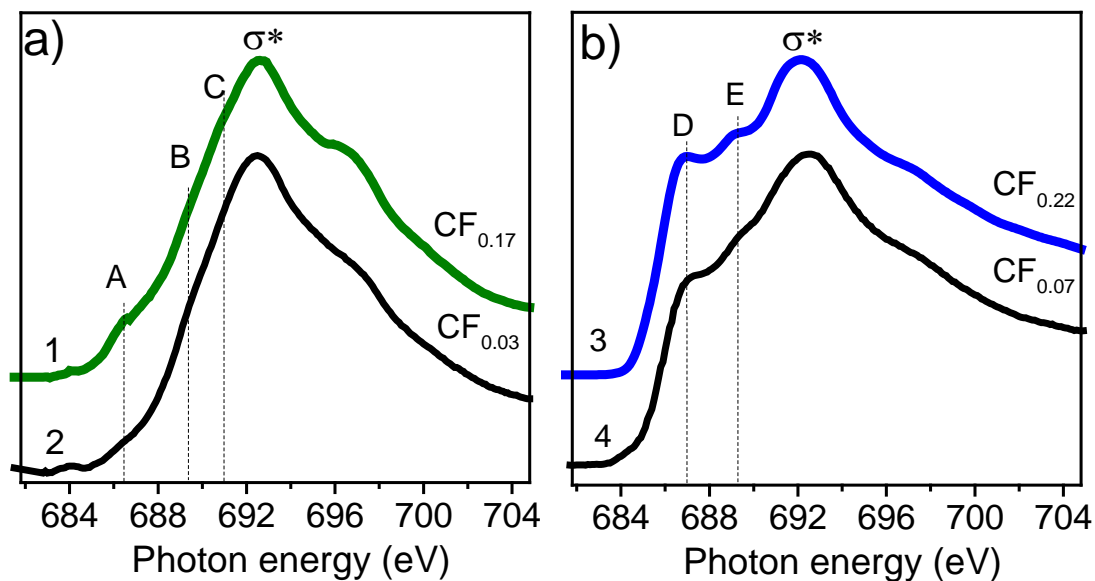
**Figure S1:** Comparison of experimental NEXAFS F K-edge spectrum (a) of fully fluorinated graphite  $(CF)_n$  and theoretical spectrum (b) calculated for an outer central fluorine atom (shown by a ball) in a CF area on carbon tube segment with composition of  $C_{106}H_{28}F_{16}$  (c). Experimental and calculated spectra were aligned by position of the first peak. The difference of 20.9 eV was used to recalculate the energy scale for the theoretical spectra presented in Figure 4b.



**Figure S2:** Comparison of NEXAFS F K-edge spectra measured for DWCNTs fluorinated using  $F_2$ ,  $BrF_3$  and  $CF_4$  plasma with the spectra calculated for fluorine atoms (highlighted by red) attached to convex surface of carbon tube segments in different quantity and pattern. We considered the models with a single F atom (structure 1), a pair of F neighbors located in (1,2) position (structure 2), four F atoms in (1,4) positions (structure 3), alternating C=C and CF-CF bonds (structure 4), four-atom armchair (structure 5) and zigzag (structure 6) chains, CF clusters consisting from four F atoms (structure 7) and six F atoms (structure 8), and  $-CF_3$  group (structure 9).



**Figure S3:** XPS C 1s spectrum for  $\text{CF}_4$  plasma-fluorinated DWCNTs measured at an excitation energy of 1486.6 eV.



**Figure S4:** Experimental NEXAFS F K-edge spectra for (a)  $\text{CF}_4$  rf plasma-fluorinated DWCNTs for 10 min (1) and 0.5 min (2), and (b)  $\text{BrF}_3$  fluorinated DWCNTs using 10 wt % (3) and 3 wt % (4)  $\text{BrF}_3$  in  $\text{Br}_2$ . The stoichiometry of fluorinated DWCNTs was estimated from XPS data.