

Supporting Information Available:

Caution: Fluorine gas is toxic, corrosive and colorless. It reacts with water intensively. Diluted fluorine gas should always be used in order to control the reaction rate and to avoid the possible safety problems. Experiment should always be carried out under the fume hood, and an alumina absorber should always be used to absorb the un-reacted fluorine gas. Cautions should also be taken in the use of hydrogen fluoride acid and the waste solutions should be processed according to the required procedures.

Synthetic procedure for ordered silica MCM-48:

1): The mixture of 9.29 g CTABr, 1.63g LE-4(Brij30), and 127g distilled water was stirred vigorously in a plastic bottle for about 10 minutes. Then, the mixture was preheated at 80 °C for 2 hours to completely dissolve the surfactant. All chemicals were from Aldrich and used as received.

2): The bottle cools down to room temperature. A 100 g sodium silicate solution (9 wt% SiO₂) was added. The capped bottle was vigorously shaken by hand for about 10-15 minutes and stirred for the extra 30 minutes.

3): The capped bottle was kept at 100 °C for 30 hours. The bottle cap was occasionally open to release pressure.

5): After removal of the bottle from oven, the pH value of the solution was adjusted to about 10 with acetic acid (dropwise). The reaction continued for extra 30 minutes.

6): The bottle was put back to the oven at 100 °C again for an extra 48 hours. The product was filtered when it was still hot. The final product was dried at 100 °C overnight.

8) Calcination conditions: RT to 550 °C, 2 °C/min and heating at 550 °C for 3 hours in flowing air.

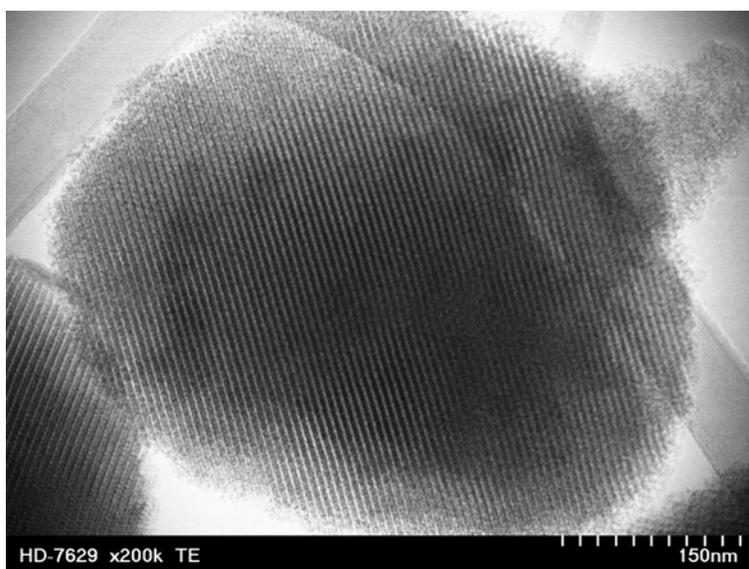


Figure S1. An additional TEM image of the fluorinated carbon CF-1 synthesized at room temperature.

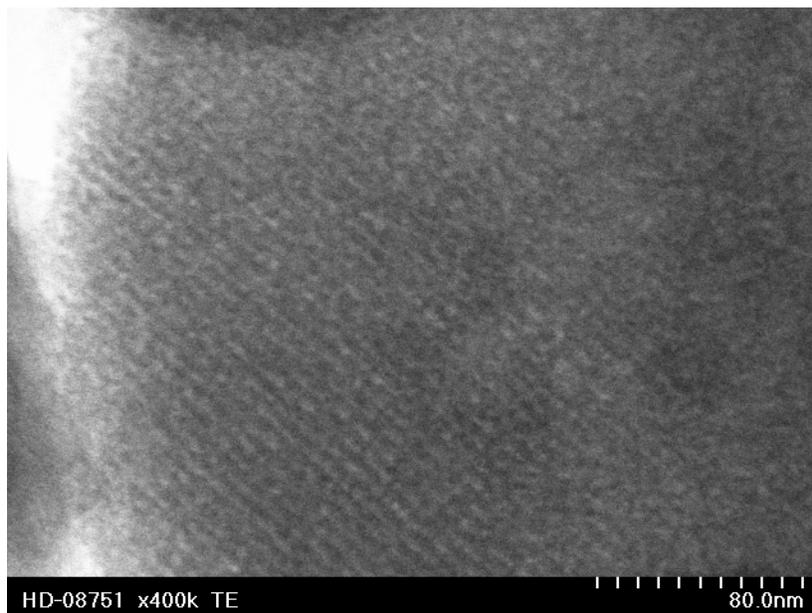


Figure S2. The TEM image of the fluorinated carbon CF-2 prepared at 150 °C.

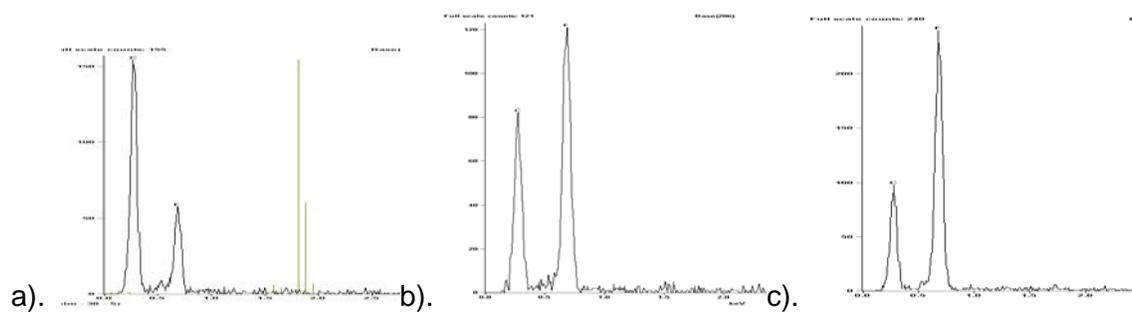


Figure S3. EDX profiles for fluorinated carbons CF-1(a), CF-2(b) and CF-3(c), showing the F/C ratio increases with fluorination temperature.

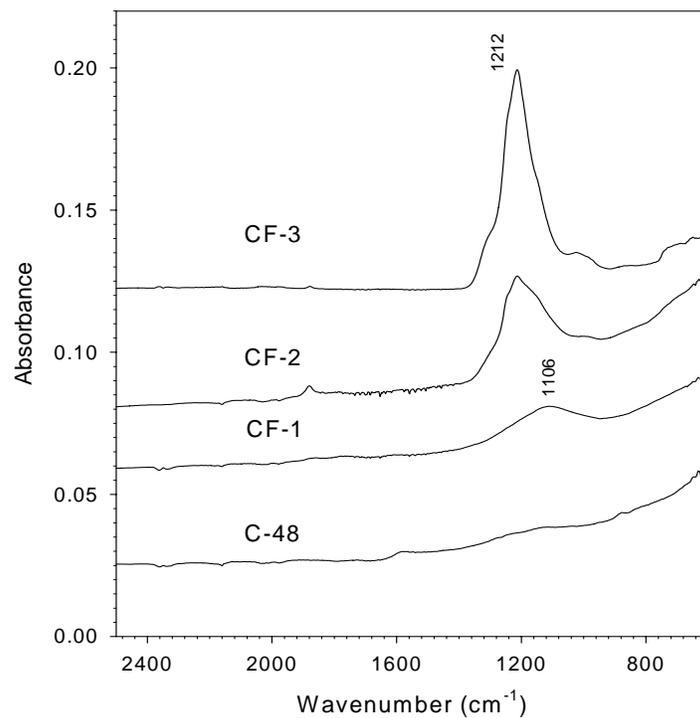


Figure S4. The FTIR spectra (ATR mode) for the ordered carbon and fluorinated carbons prepared at different temperatures.

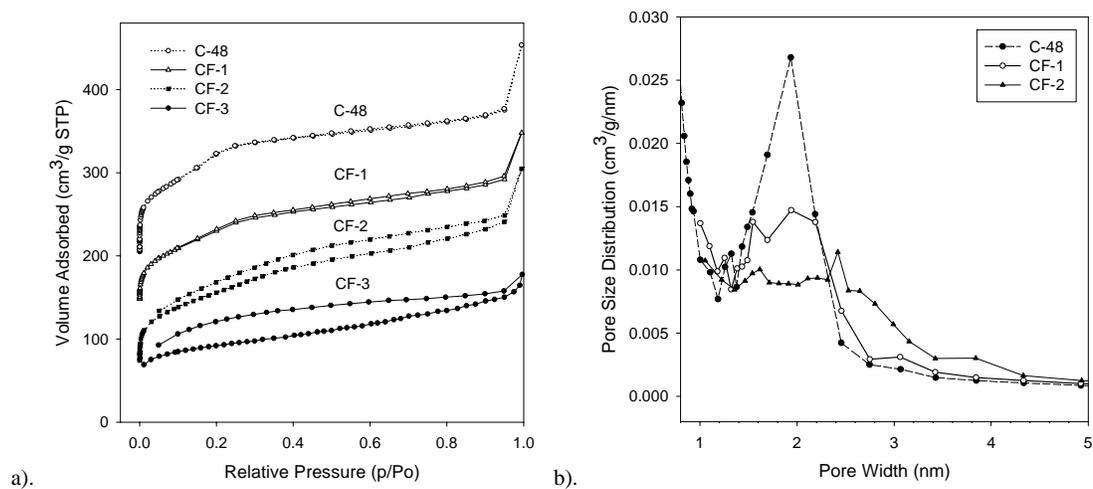


Figure S5. Adsorption isotherms (a) and pore size distributions (b) for ordered carbons and the corresponding fluorinated samples CF-1, CF-2, CF-3. For viewing purpose, the isotherms for C-48, CF-1 and CF-2 are up-shifted by 210 cm³/g, 140 cm³/g and 70 cm³/g, respectively.

Table S1. The BET surface area and total pore volumes for unfluorinated and fluorinated samples

Sample	C-48	CF-1	CF-2	CF-3
BET Surface Area (m ² /g)	437	335	324	332
Total Pore Volume (cm ³ /g)	0.41	0.32	0.35	0.28
BET constant	52	50	48	172