Electronic Supplementary Material (ESI) for RSC Advances.
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Supp Info:

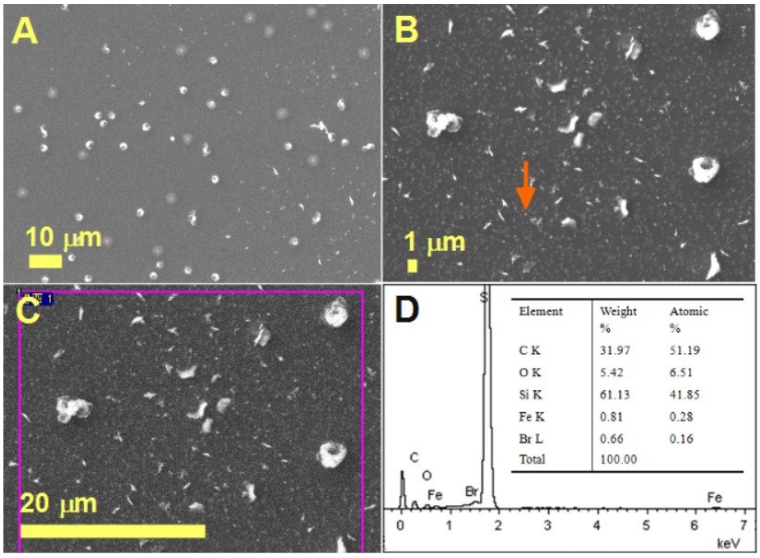
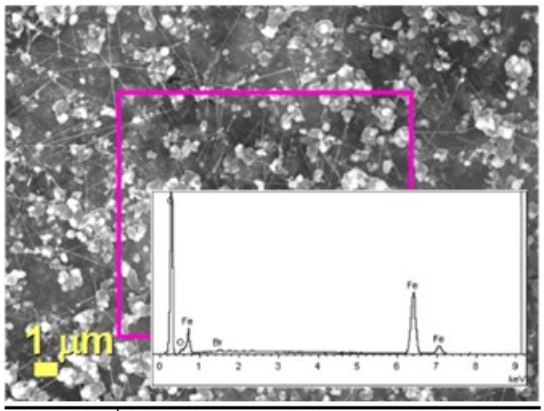
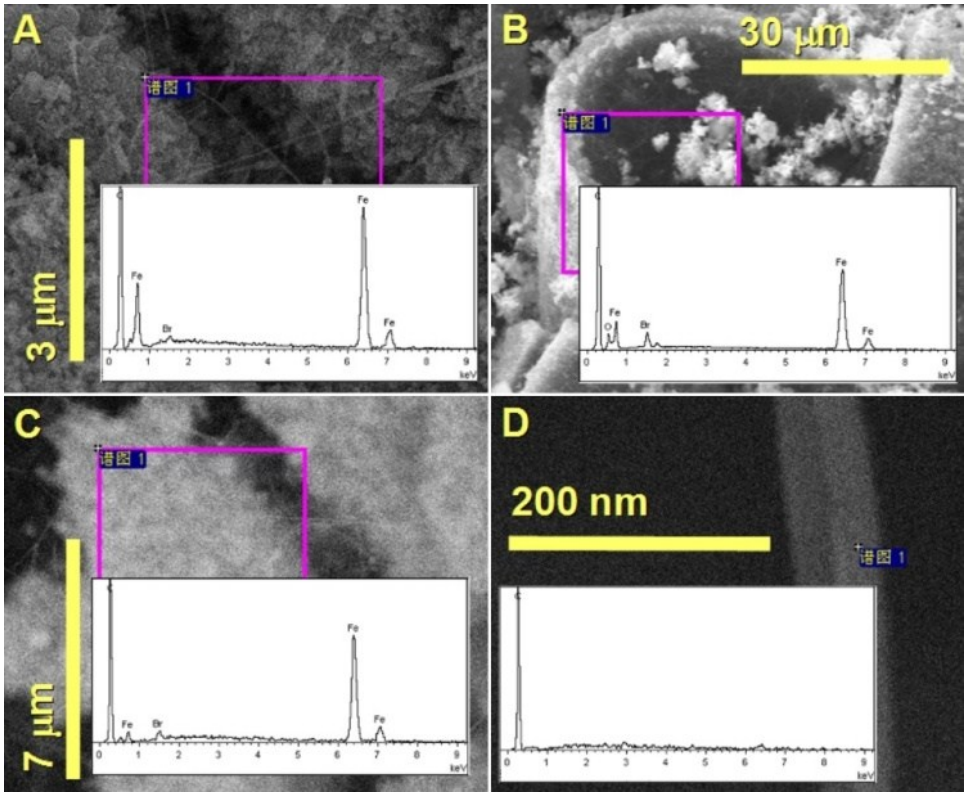


Fig.1: Supp Info Scanning Electron Micrographs showing in A-C the surface of the Si substrate extracted from the reactor after sublimation and pyrolysis of the only (6-Bromohexyl)ferrocene (35 mg). In this specific case no CNTs were found in the substrate. Instead only small particles, as indicated by the orange arrow, were observed. The EDX analyses of the area selected in C is shown in D together with the element abundances. Interestingly Br and Fe were found with a similar atomic %. The observation of Si and O can be associated to the Si and SiO_2 substrate-regions.



Element	Weight %	Atomic %
C K	72.11	89.62
O K	4.44	4.14
Fe K	23.09	6.17
Br L	0.36	0.07
Total	100.00	

Fig.2: Supp Info showing an area of the sample produced by CVD of 30 mg of ferrocene and 3.2 mg of (6-Bromohexyl)ferrocene used for the EDX analyses. The analyses revealed the presence of small residues of Br (0.36 weight %).



A

Element	Weight %	Atomic %
C K	72.81	92.61
Fe K	26.65	7.29
Br L	0.54	0.10
Total	100.00	

B

Element	Weight %	Atomic %
C K	64.29	83.44
O K	9.77	9.52
Fe K	23.57	6.58
Br L	2.36	0.46
Total	100.00	

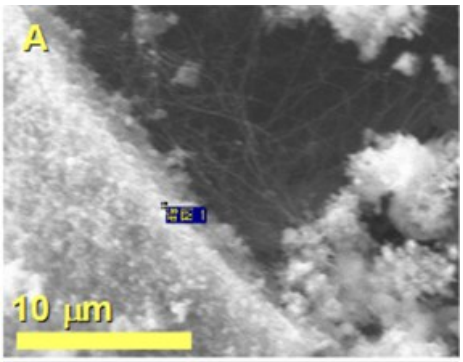
C

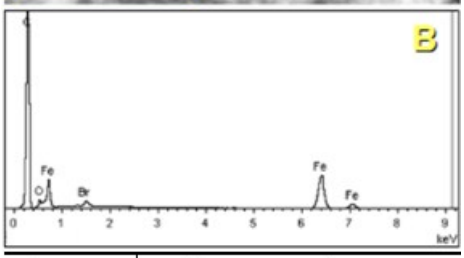
Element	Weight %	Atomic %
C K	67.28	90.63
Fe K	31.51	9.13
Br L	1.21	0.25
Total	100.00	

D

Element	Weight %	Atomic %
C K	100.00	100.00
Total	100.00	

Fig.3 Supp-info and corresponding tables of elemental composition: Scanning electron micrographs showing different EDX analyses performed in the samples produced by CVD of 6.4 mg (in A), 12.8 mg (in B) and 25.6 mg (in C) of (6-Bromohexyl)ferrocene with ferrocene. The analyses revealed a variable presence of Br residues: 0.54 weigth % in A, 2.36 weight% in B and a variable weight % from 2 to 1.2 in the case of C. In D the EDX analyses of isolated CNTs show that no Br residues are present in the CNTs-walls or in the CNTs-core. The table of the elemental -composition is also shown in detail for the samples 1-4 in A, B, C and D.





Element	Weight %	Atomic %
C K	77.38	89.42
O K	8.14	7.07
Fe K	13.41	3.33
Br L	1.06	0.18
Total	100.00	

Fig.4 Supp-info: Scanning electron micrograph showing in A the morphology of the film of nanoparticles peeled off from the Si/SiO_2 substrate. The EDX analyses (in B) performed in the film revealed the presence of Br residues up to 1 weight %.

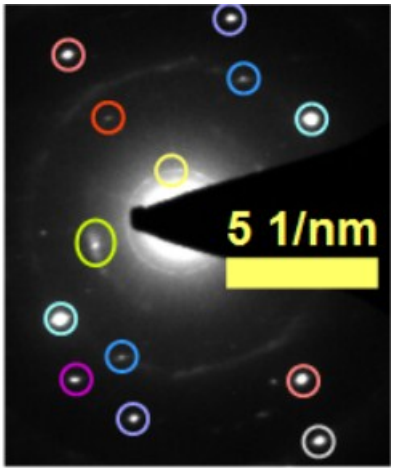


Fig.5Supp-info: selective area electron diffraction of a typical Fe_3C particle encapsulated in a CNTs analysed from sample 1 showing the following reflections indicated with coloured circles: violet circle indicating reflection corresponding to a lattice spacing of 0.15 nm (103 reflection), blue circle indicating reflection corresponding to a lattice spacing of 0.20 nm (031 reflection), cyan circle indicating reflection corresponding to a lattice spacing of 0.19 nm (112 reflection) , Yellow circle indicating an not-indexed reflection-ring corresponding to a lattice spacing of 0.60 nm (this lattice-spacing can not be associated to Fe_3C and could be associated to a stressed arrangement of the CNTs walls), green circle indicating reflection corresponding to a lattice spacing of 0.37 nm (002 reflection of CNTs graphitic carbon) ,

magenta circle indicating reflection corresponding to a lattice spacing of 0.16 nm (130 reflection), orange circle indicating reflection corresponding to a lattice spacing of 0.26 nm (021 reflection), salmon circle indicating reflection corresponding to a lattice spacing of 0.15 nm (212 reflection), grey circle indicating reflection corresponding to a lattice spacing of 0.12 nm (223 reflection)

Experimental

Mixtures of ferrocene (purchased from sigma-aldrich CAS 102-54-5) and (6-Bromohexyl)ferrocene (purchased from sigma aldrich CAS 136237-36-0) were sublimated and pyrolyzed in a chemical vapour deposition system comprising a quartz-tube reactor of 1.5 m, outer diameter of 22 mm and wall thickness of 2.5 mm, an electrical furnace with a temperature of 990 ºC. The sublimation temperature was 300 ºC. An Ar flow (at the flow rate of 11 ml/min) was used to deliver the sublimated precursors in the decomposition region. Four types of samples were prepared with different quantities of (6-Bromohexyl)ferrocene: 3.2 mg, 6.4 mg, 12.8 mg and 25.6 mg respectively. Each quantity of (6-Bromohexyl)ferrocene was mixed with 30 mg of ferrocene and fed into the CVD system in separate reactions. Reaction performed with the only (6-Bromohexyl)ferrocene (35 mg) did not yield CNTs.

The morphological characterization was performed through SEM, backscattered electrons and EDX with a JSM-7500F at 5-20 kV, TEM, HRTEM, STEM and EDX with a 200 kV American FEI Tecnai G^2F20. XRD analyses were performed with a DX 2500 with a Cu anode. TGA were performed with a TA Q500 with heating rate of 20 Celsius degrees per minute.