

Fig.1 supp: Transmission electron micrograph (STEM mode) showing the cross-sectional morphology of the film obtained by pyrolysis of large quantities of toluene (1 ml) with ferrocene (600 mg). Due to the micrometre thickness of the film and also the large quantity of graphitic carbon, HRTEM or EDX can not be considered for the estimation of the particles composition which is expected to be Fe_3C according with the XRD analyses.

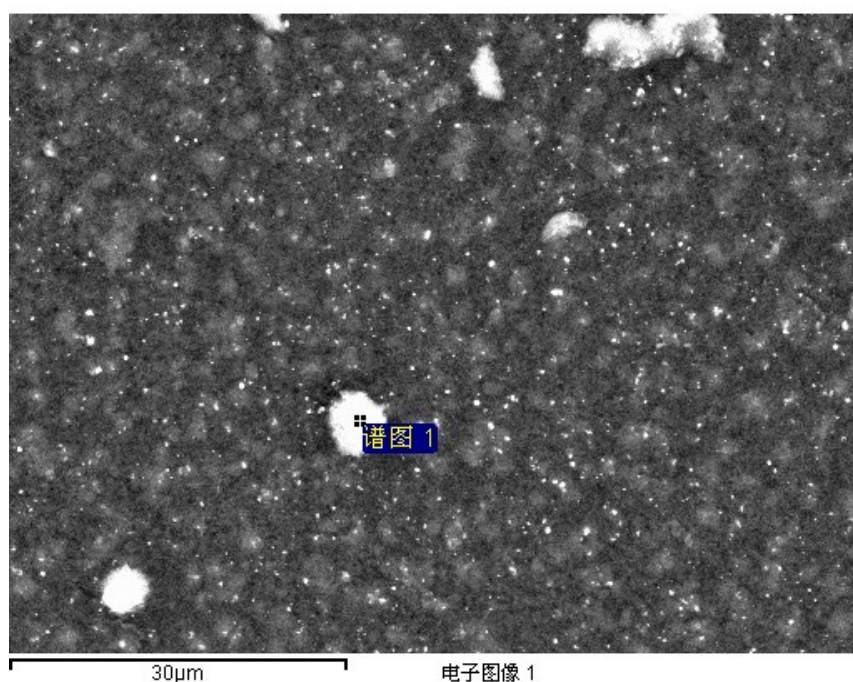


Fig.2supp: Backscattered electron micrograph showing an high detail of the bright spherical features observed in the film obtained by pyrolysis of large quantities of dichlorobenzene and ferrocene.

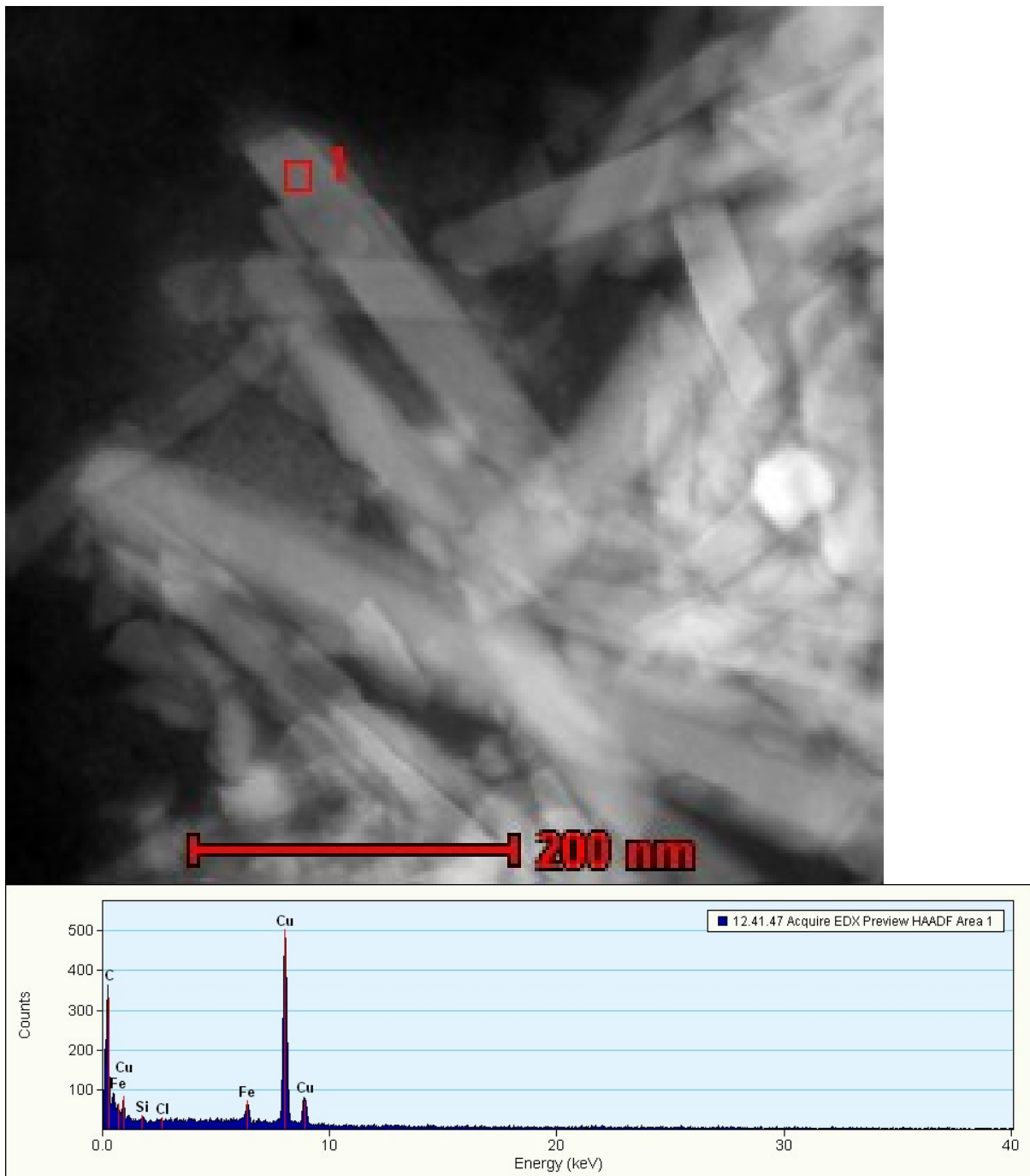


Fig.3 Supp.: (Top) STEM image showing with high detail the Fe₃C crystals (bright areas) encapsulated inside the CNTs. Note that due to the atomic contrast the graphitic CNTs layers can not be observed very clearly, while the Fe content is represented by the bright regions. The red square indicates the area of EDX analyses. (bottom) EDX analyses showing the presence of C (93.7%) and Fe (5.7%) elements as the main components of the film. Note that small impurities of Si (0.03%) and Cl (0.48%) could still be observed. Due to the micrometre thickness of the film and therefore the large quantity of graphitic carbon, elemental analyses can not be considered for the estimation of the nanowire composition (i.e. it is difficult to separate the carbon contribution within the nanowire from the carbon contribution of the graphitic nanotubes walls) which is expected to be Fe₃C according with the XRD analyses. In addition a small contribution of the amorphous holey carbon film on the TEM grid should be considered. The Cu signal is due to the Cu grid used in the TEM.

Similarly, the use of HRTEM or XPS measurements is limited by the thickness of the buckypaper films and by the large quantity of graphitic layers. Note that the penetration depth of the X-rays in XPS is below 10 nm (much lower than that of X-rays in the XRD measurements, which is in the order of many micrometres, 8-10 micrometres).

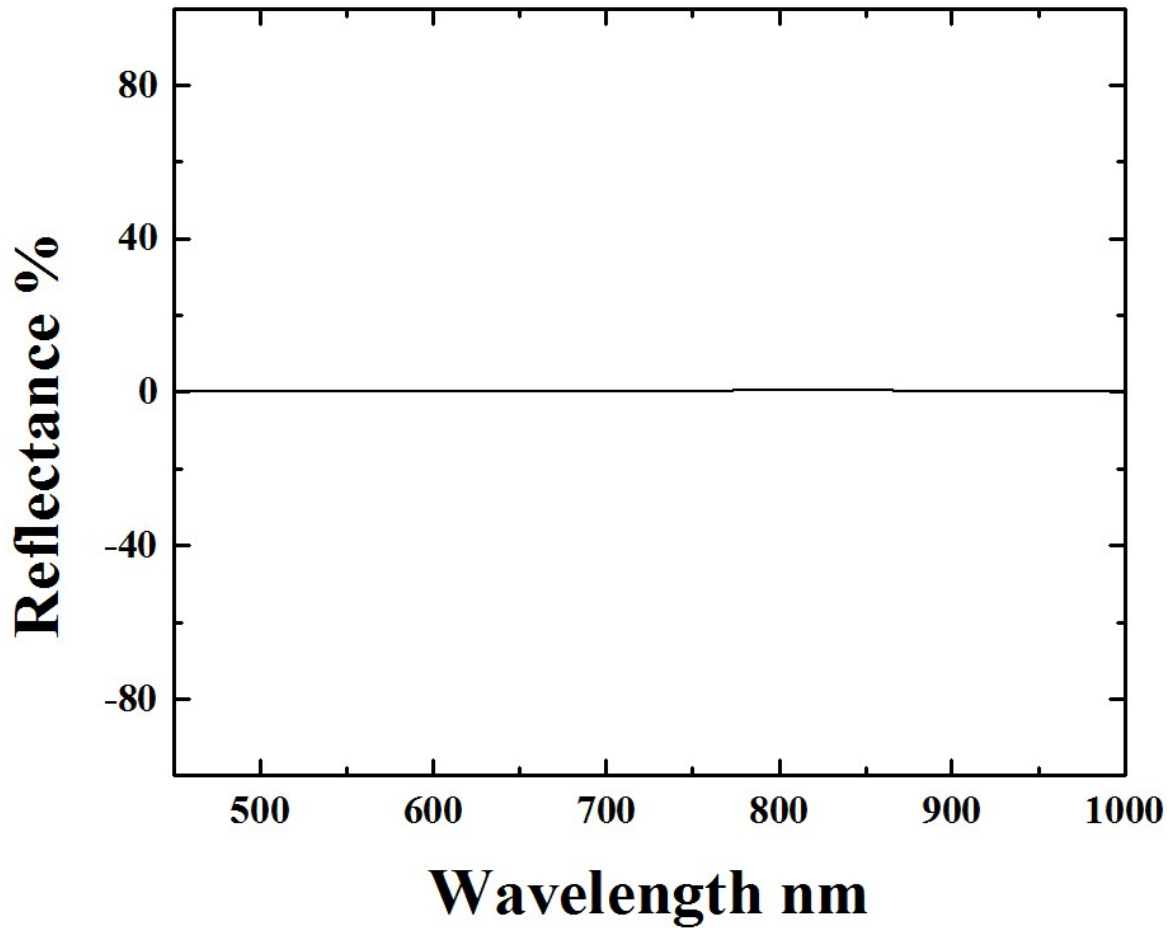


Fig.4 Supp.: Reflectance measurement performed in the graphitic film (rough black side) produced in presence of ferrocene/Toluene. In this case no reflectance is observed.

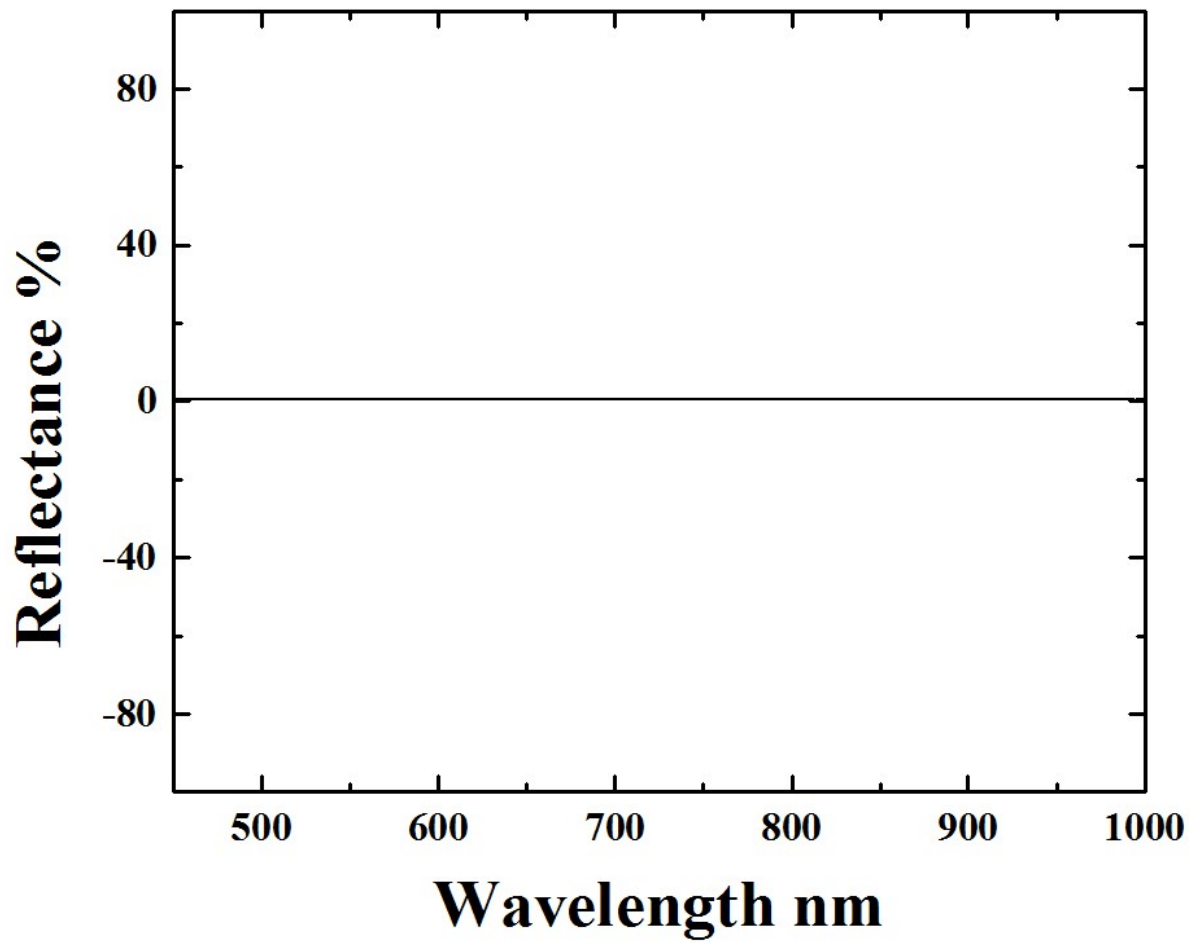


Fig.5 Supp.: Reflectance measurement performed in the graphitic film (rough black side) produced in presence of ferrocene/Dichlorobenzene. No reflectance is observed.