

Supplementary Materials for

Stacking-fault nucleation in films of vertically oriented multiwall carbon nanotubes by pyrolysis of ferrocene and dimethyl-ferrocene at low vapour flow rate

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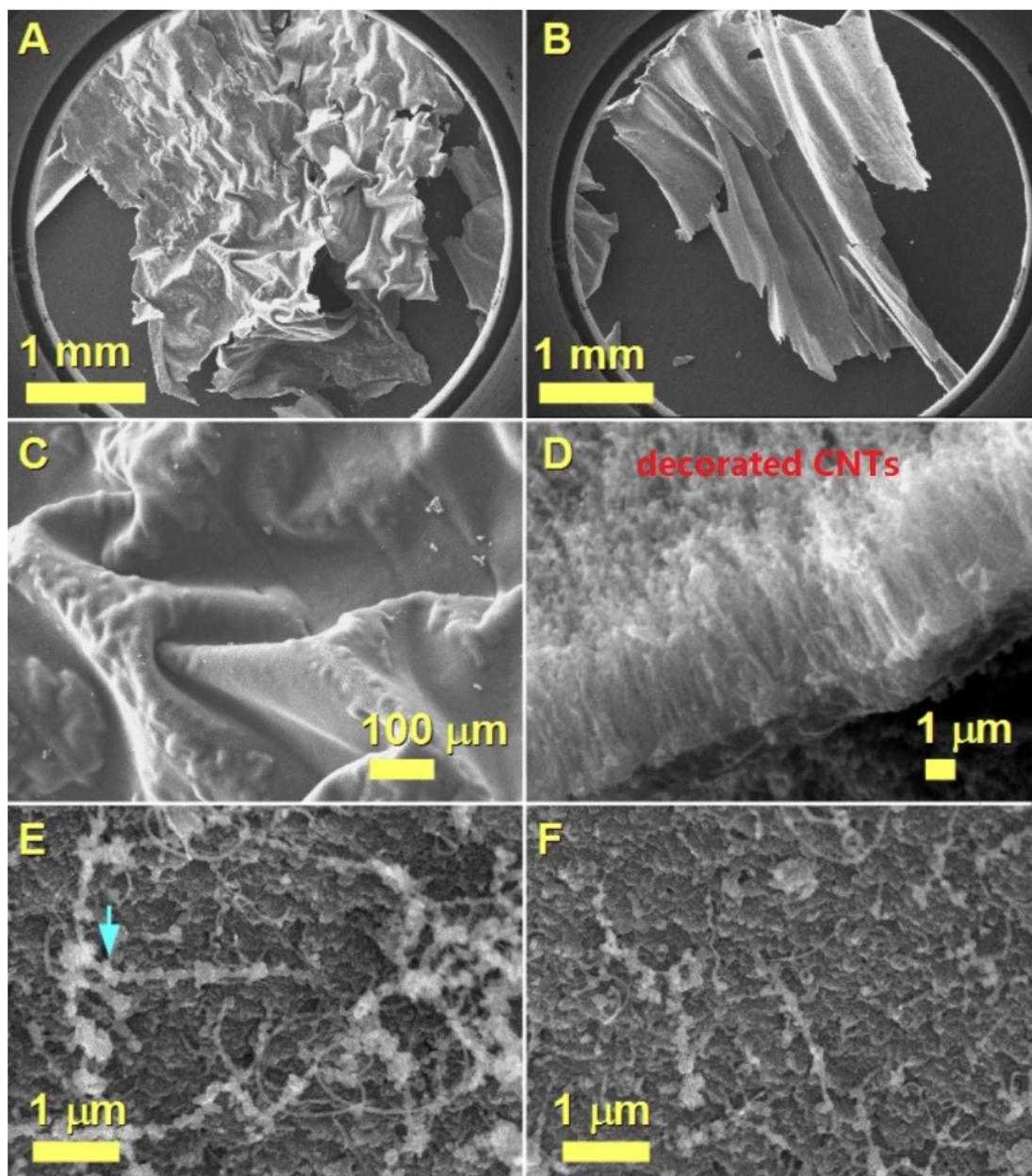


Figure S1: SEM micrographs A-F showing (with an increasing level of detail) the surface morphology of the as grown film (A-C), comprising of vertically aligned CNTs decorated with filled CNOs (at vapour flow rates of 5 mL/min). The high alignment of the CNTs in the film is visible in D, while the CNO decoration is presented in E,F. The cyan arrow in E indicates an example of decorated CNT (see experimental section for further details on the method of production).

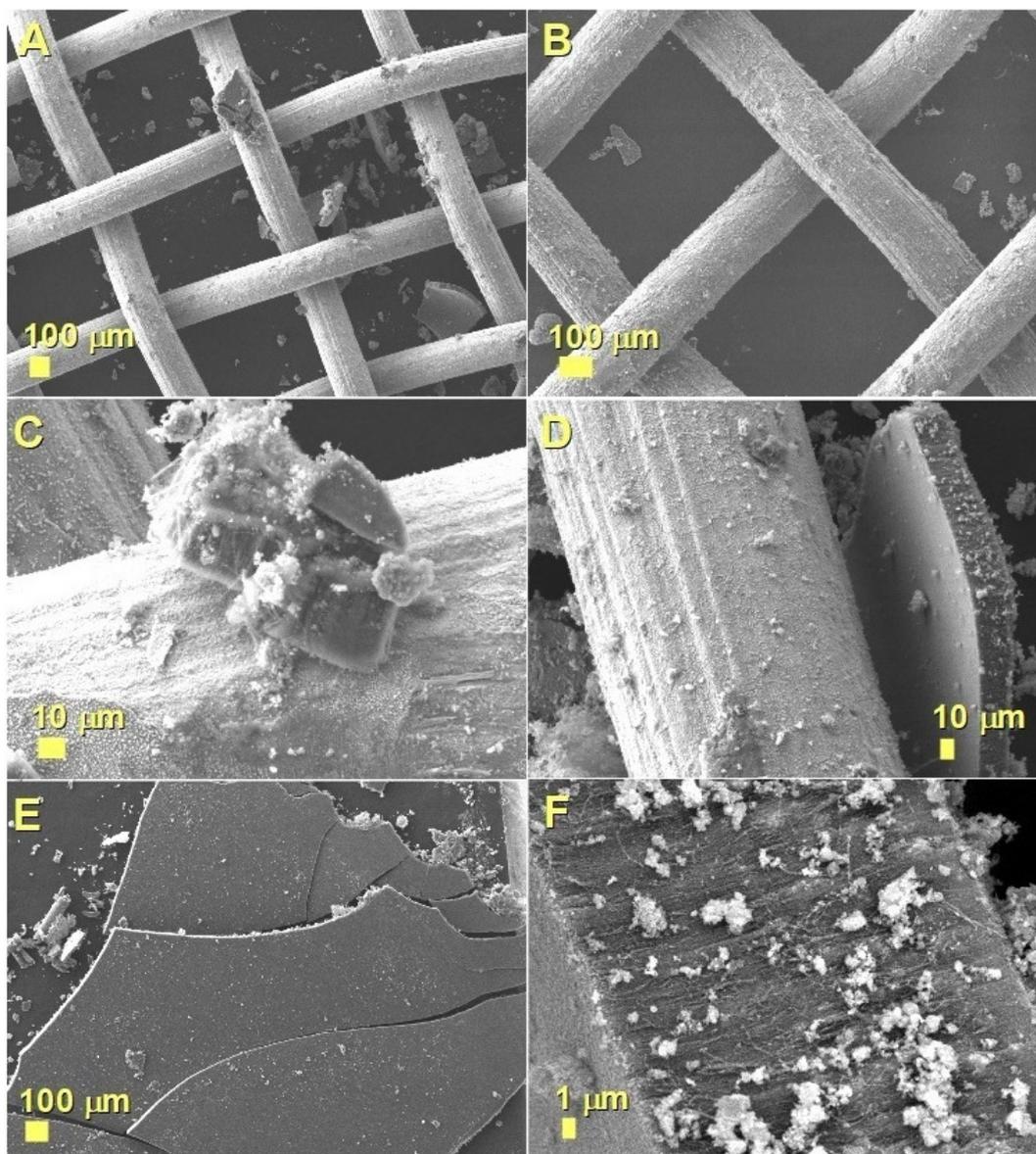


Figure S2: Typical examples of SEM micrographs (A-F) exhibiting the morphological aspects of typical VA-MWCNT films obtained by pyrolysis of ferrocene at low vapour flow rate, when employing a metallic grid as deposition substrate. Note the presence of free-standing VACNT morphologies which derive from the differential thermal contraction process. In E,F the morphological aspects of the VACNTs evidence a high alignment of the CNT-bundles and decoration with CNO-particles.

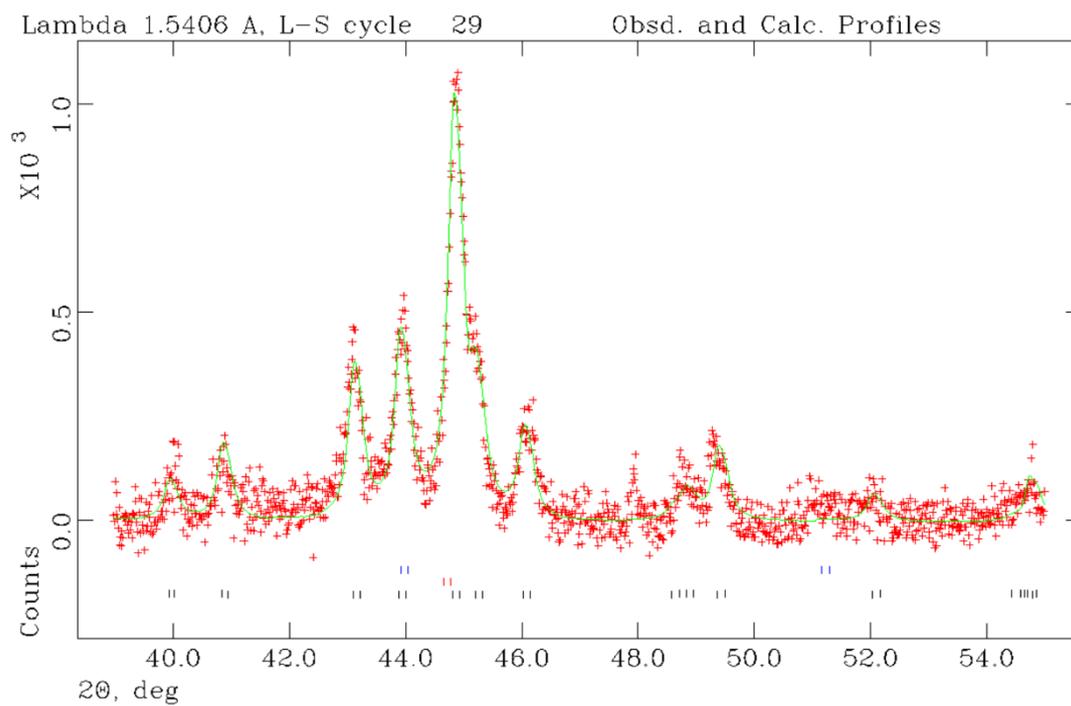


Figure S3: Additional example of Rietveld refinement analysis of a typical XRD diffractogram of the film. The green line represents the theoretical fit to the XRD data (red crosses). The following unit cell parameters could be extracted, namely Fe₃C (Pnma) $a = 0.506$ nm, $b = 0.672$ nm, $c = 0.451$ nm, α -Fe (Im-3m) $a = b = c = 0.287$ nm and γ -Fe (Fm-3m) $a = b = c = 0.357$ nm.

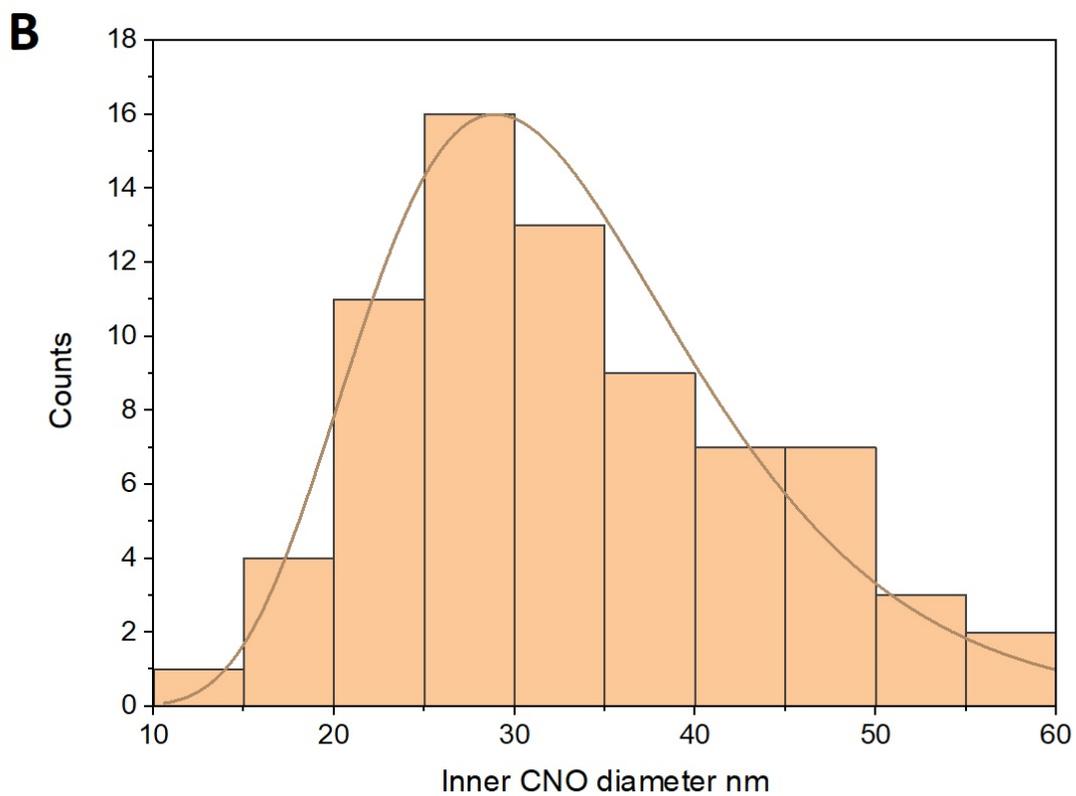
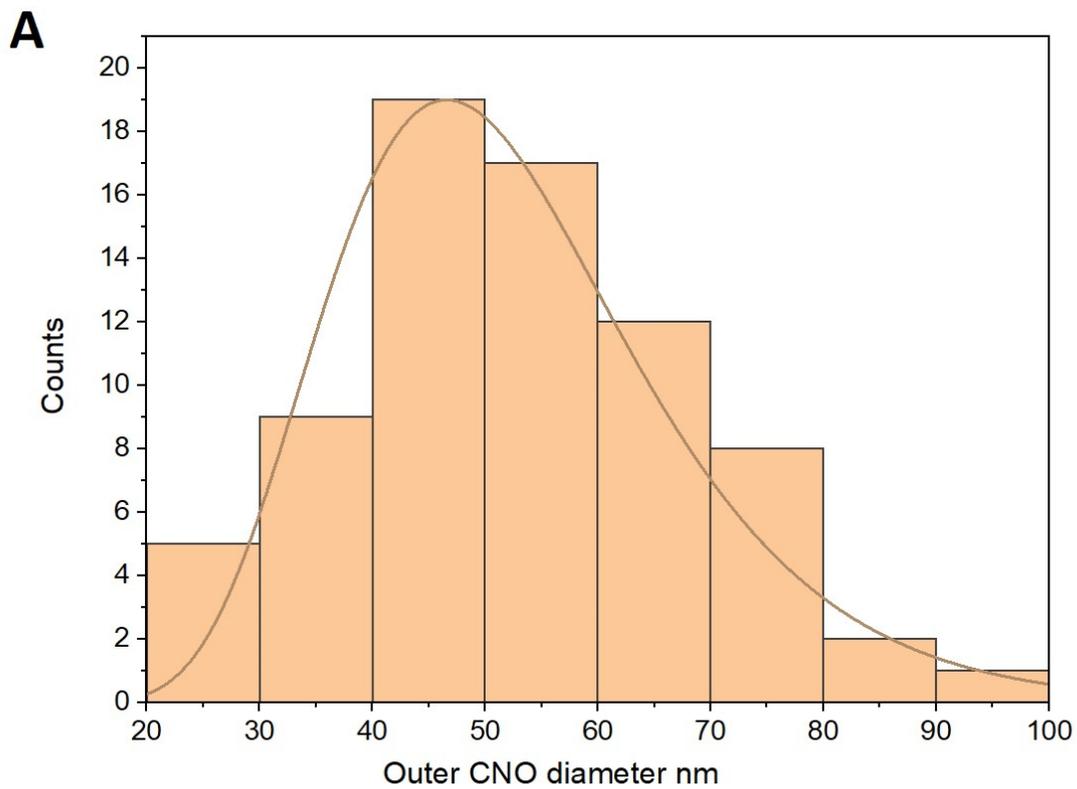


Figure S4: Statistical distribution of the inner and outer CNO diameters, for samples produced at 5 mL/min, by pyrolysis of ferrocene.