Supplementary Material (ESI) for Journal of Materials Chemistry

Supporting Information

Graphite-like carbon-encapsulated iron nanoparticle self-assembly into macroscopic microtube structures

Zhenyu Liu[†‡], Lijie Ci[†], N. Y. Jin-Phillipp[†], M. Rühle[†]

[†] *Max-Planck-Institut für Metallforschung, Heisenbergstra. 3 D-70569, Stuttgart, Germany*
[‡] *State Key Laboratory of Coal Conversion, Insititute of Coal Chemistry, P. O. Box, 165, Taiyuan, Shanxi 030001, P. R. China*

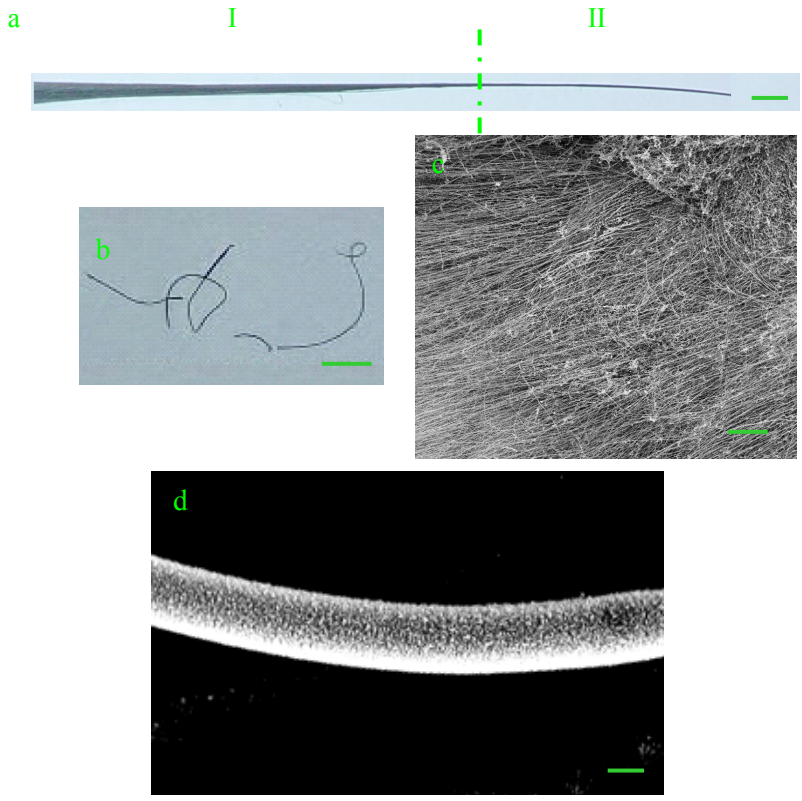

Fig. S1. a) Macroscopic morphology of vapor grown carbon fibers and carbon-encapsulated iron nanoparticle microtube superstructure (Scale bar: 1 cm). b) Optical images of the graphite –like carbon-encapsulated iron nanoparticle microtubes, the formed millimeter-scale circle shows good flexibility (Scale bar: 500 μm). (c) Low magnification SEM image for vapor grown carbon fibers. (Scale bar: 150 μm) d) Graphite-like carbon-encapsulated iron nanoparticles self-assembled tubular superstructure. (Scale bar: 50 μm)

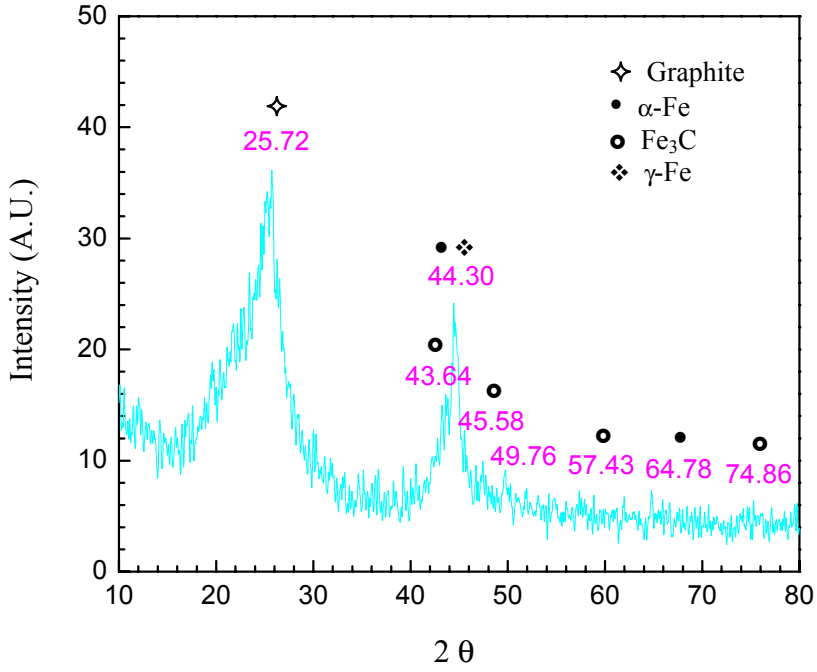

Fig. S2. X-ray diffraction pattern of the graphite-like carbon-encapsulated iron nanoparticle microtubes (Cu Kα radiation, λ=0.1542 nm).

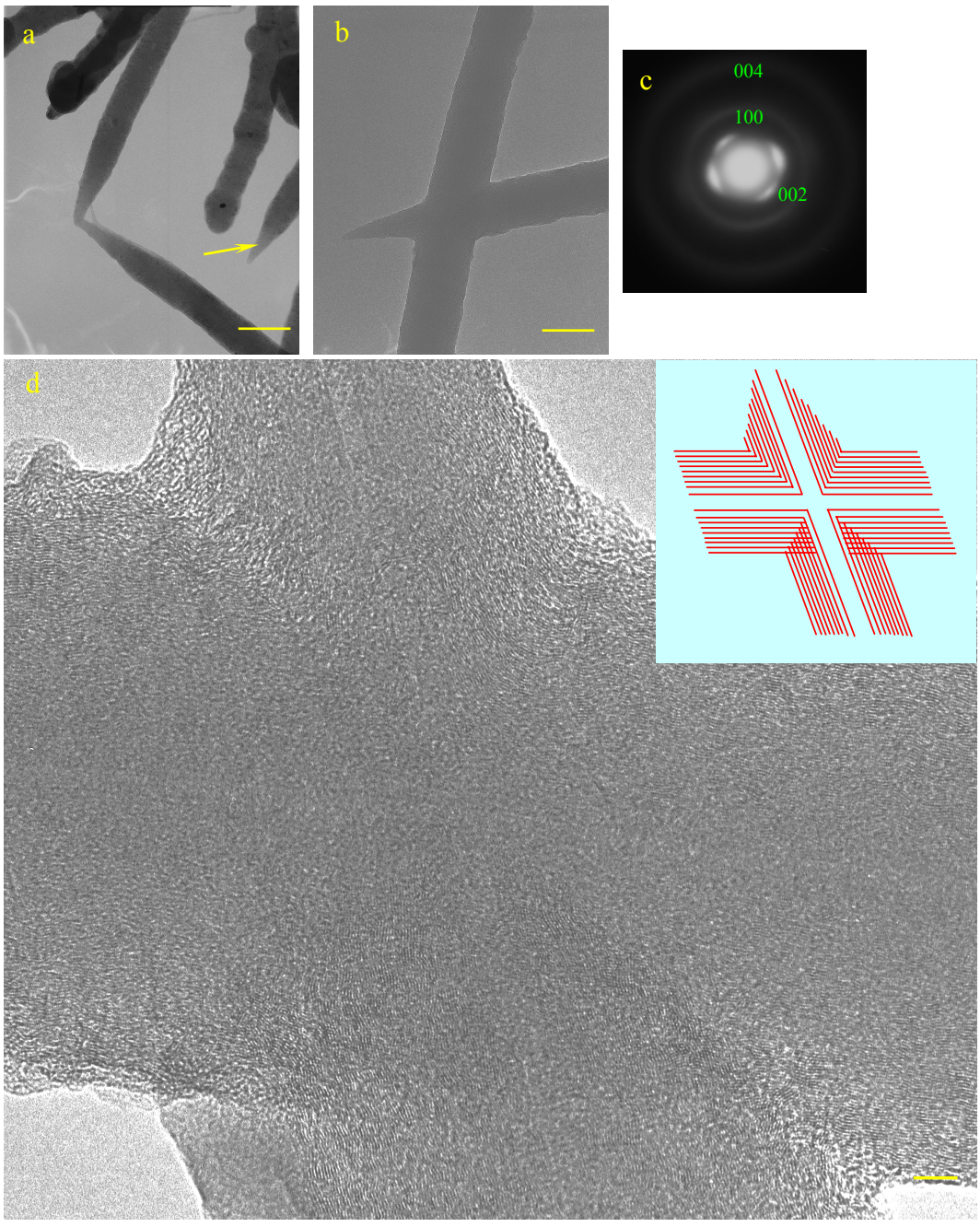

Fig. S3. a) TEM image for a carbon nanotube intermolecular junction formed by two carbon nanotubes, which grow to meet each other. Arrow indicates another similar CNT with conical tip. (Scale bar: 100 nm). b) TEM image for a carbon nanotube cross junction. (Scale bar: 60 nm) c) SAED pattern of the cross junction. d) HRTEM of the carbon nanotube cross junction, showing clearly steady connection and microstructure of nearly ideal hollow connected part after restructuring. (Scale bar: 5 nm) The inset shows the structural model of the cross junction.