Hydrocarbon and Carbon Nanostructures Produced by Sonochemical Reactions of Organic Solvents on Hydrogen-Passivated Silicon Nanowires under Ambient Conditions

C.P. Li,[1,2] Boon K. Teo,[3]* X.H. Sun,[1,4] † N.B. Wong,[1,4] S.T. Lee,[1,2]*

[1]Center of Super-Diamond & Advanced Film, [2]Department of Physics and Materials Science, [4]Department of Biology and Chemistry, City University of Hong Kong, Hong Kong SAR, China.

[3]Department of Chemistry, University of Illinois at Chicago, 845 W. Taylor Street, Chicago, IL, 60607.

RECEIVED DATE (to be automatically inserted after your manuscript is accepted if required according to the journal that you are submitting your paper to)

To whom correspondence should be addressed. Email: boonkteo@uic.edu (for Boon K. Teo), apannale@cityu.edu.hk (for S.T. Lee)

† Present address: Department of Chemistry, University of Western Ontario, London, Canada

Supporting materials

Fig. S1 is a low-magnification TEM image of an assortment of carbon nano loops. The HRTEM images of some of the loop-like structures are depicted in Fig. 5. Some other connected hydrocarbon nanostructures were observed also observed. Fig. S2 shows a HCNO, with a core diameter of about 1.7 nm and eight shells, grown as a "knot" attached to the body of a HCNT with eight layers and an interlayer spacing of 4 Å. Similar but less regular shaped onions can be found embedded in the "trunk" of the HCNT. A connected network of HCNT/HCNO is shown in Fig. S3(a) and an embroidery-like pattern is depicted in Fig. S3(b). Many other morphologies or nanostructures were also observed.

Figure S1. A low-magnification TEM image of some carbon nano loops.

Figure S2. A HRTEM image of a HCNO, with a core diameter of about 1.7 nm and eight shells, grown as a "knot" attached to the body of a HCNT with eight layers and an interlayer spacing of 4 Å.

Figure S3. (a) A HRTEM image of a connected network of HCNT/HCNO. (b) A HRTEM image of a belt of connecting HCNT/HCNO.
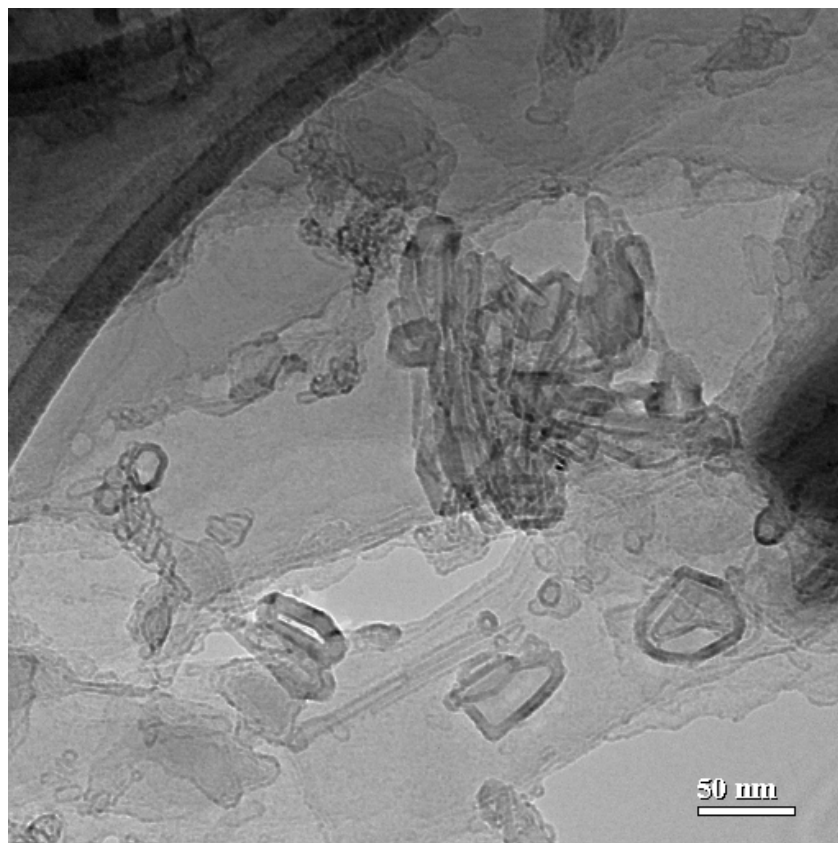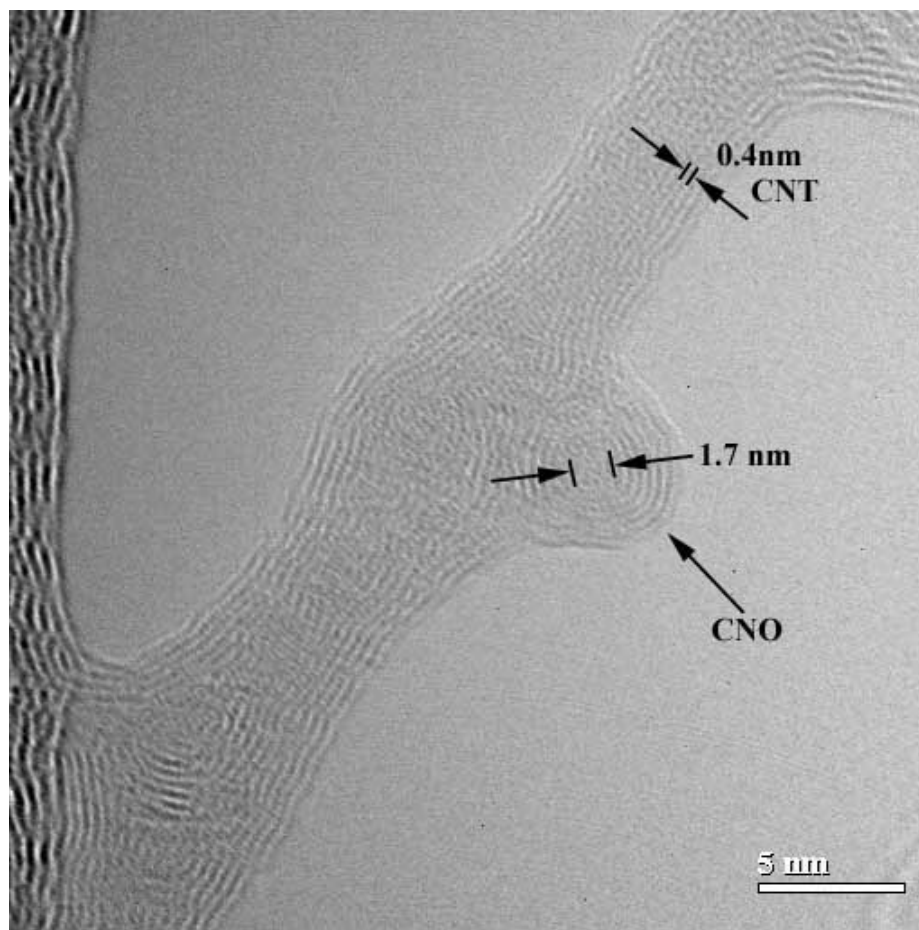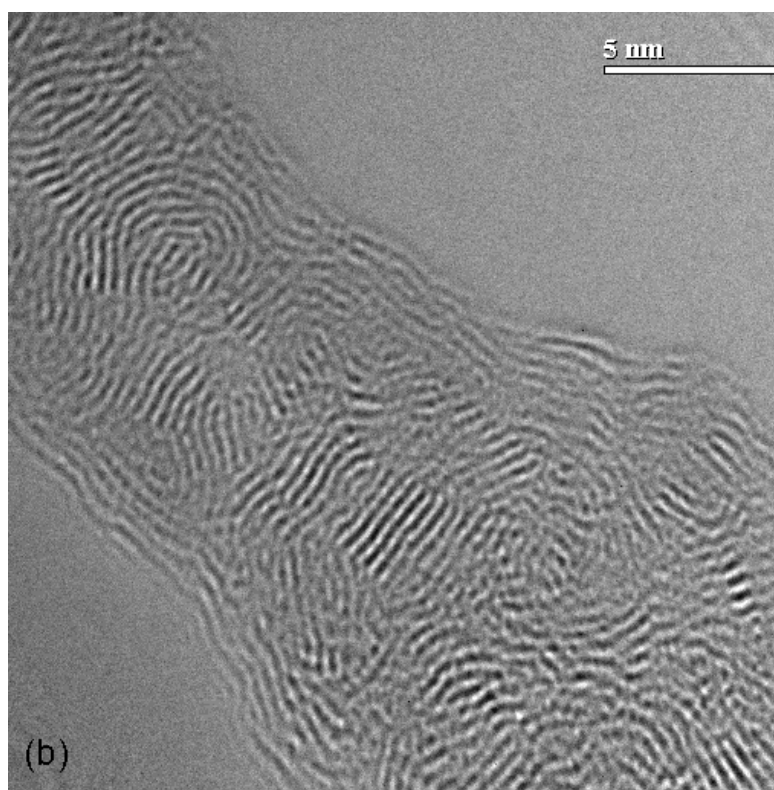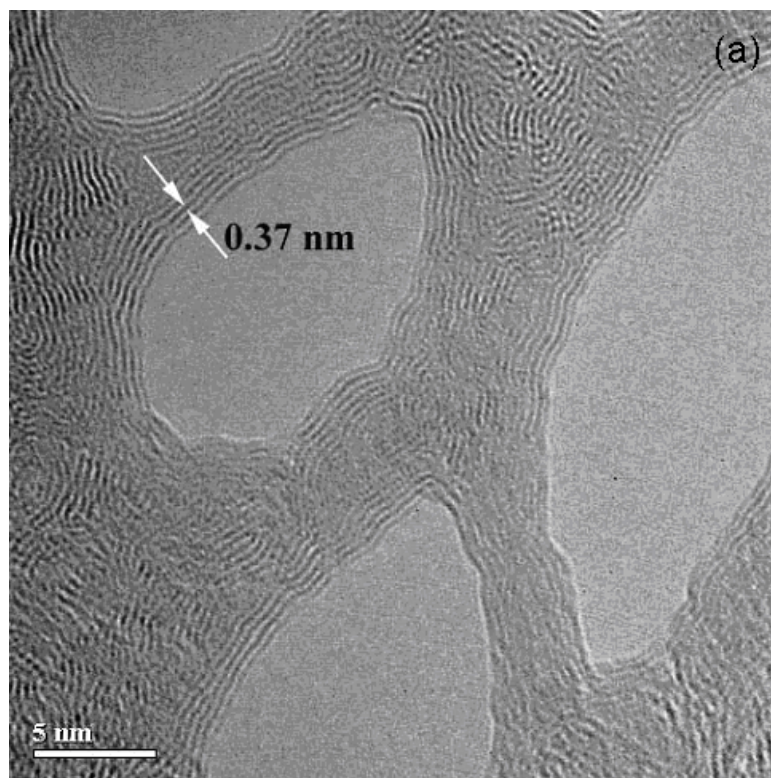
Fig. S1

Fig. S2

(a)

0.37 nm

5 nm

(b)

5 nm

Fig. S3