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Truth Forum of Science

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Quantum Metal-Nanowires in Carbon Nanotubes

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摘要

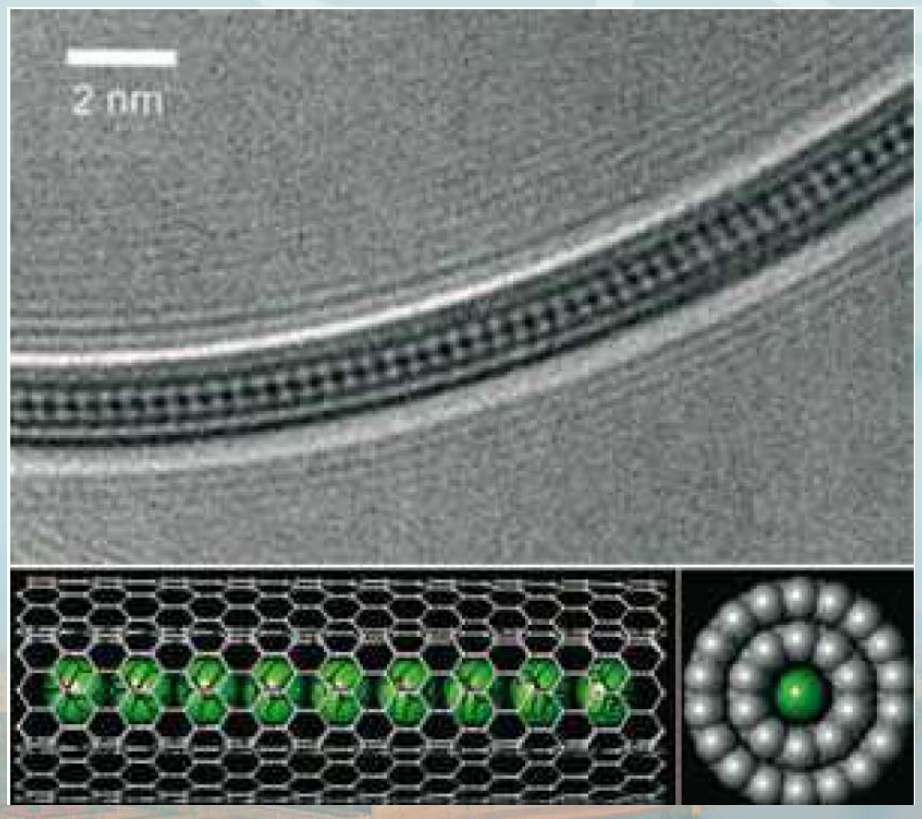
The carbon nanotube is one of the most fascinating materials for nanoscience and nanotechnology for the 21st century green world. In particular, the inner hollow space of carbon nanotubes is a very unique nanospace which may provide fields for fabricating, for example, quantum dots [1] and atomic nanowires [2] of novel structures.

Here, I will talk about the fabrication and characterization of the so-called peapods [3] and nanowires of various metals, which are self-assembled in single-wall and double-wall carbon nanotubes in high yield (>90%). Structure determination based on simulated annealing calculation and high-resolution transmission electron microscope (HRTEM) image simulation has revealed that the structures of the nanowires made within nanotubes are unusual with anomalously large nearest-neighbor atom-to-atom distance [4].

The current new technology provides promises to fabricate various metal complexes nanowires in high-yield and may also be of more general importance in understanding and exploring electronic and magnetic properties in low-dimensional systems.

Hisanori SHINOHARA 教授简介：

Hisanori SHINOHARA is widely known for his achievement on the fabrication and characterization of the so-called nanocarbons, which include endohedral metallofullerenes, nano-peapods and other novel carbon nanotube materials. Totally, he has published over 470 original and peer-reviewed scientific papers including approximately 300 in the top physics, nanoscience / nanotechnology and chemistry journals (4 in Nature, 1 in Nature Chemistry, 1 in Science and 13 in Physical Review Letters), and more than 50 review papers in journals and books. He has also presented a lot of international invited lectures/seminars and conference talks. He is also the members of Fullerenes/Nanotubes Research Society (currently President of the society), Japan Physical Society, Japan Mass Spectrometry Society, Japan Chemical Society, Materials Research Society (U.S.A.), Electrochemical Society (U.S.A.), American Association for the Advancement of Science (U.S.A.), and serves as editors/associate editors in many international journals in physics, materials science and engineering. He has won Japan Mass Spectrometry Society Prize (1991), Metallic Materials Science Award (1994), Japan IBM Science Prize (1996), Molecular Science Forum Lectureship at Chinese Academy of Science (CAS, Beijing) (2002), Ishikawa Carbon Prize (2006), and The Chemical Society of Japan Award (2010).



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