Manipulating Carbon Nanotubes into Carbon Nanobulbs and Carbon Tube-in-tube Assembly

D. S. Su

Department of Inorganic Chemistry, Fritz Haber Institute of the MPG, Faradayweg 4-6, D-14195 Berlin, Germany

Abstract

We report the reorganization of carbon nanotubes into carbon nanobulbs and carbon tube-in-tube assembly. The blowing of multi-walled carbon nanotubes into carbon nanobulbs is realized in a unique tube growth environment generated by explosive decomposition of picric acid mixed with nickel formate. The carbon spherical bulbs are characterized by large dimensions (up to 900 nm), thin walls (around 10 nm), and fully hollow cores. The carbon tube-in-tube assembly is obtained by interlacation-exfoliation-functionalisation of carbon nanotubes with nitric acid followed by a treatment in tetrahydrofuran solution.