

Catalytically Grown Carbon Nanotubes and Their Applications

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Carbon nanotubes consisting of rolled graphene layer built from sp^2 units have attracted the imagination of scientists as one-dimensional macromolecules. Their unusual physical and chemical properties will revolutionize everything from computer, nanocomposite, nano-electronic device, vehicle to sensor etc. Through judicious selection of transient metal, support materials and synthetic conditions (temperature, duration), it is possible to produce different types of carbon nanotubes such as multi-walled carbon nanotubes (MWNTs), double-walled carbon nanotubes (DWNTs) and single-walled carbon nanotubes (SWNTs) selectively. In this study, we will describe the catalytic synthesis of various carbon nanotubes from the point of synthetic conditions and their practical applications of these carbon nanotubes will be described from the industrial point of view. Recent hot topics “highly pure and crystalline DWNTs by a catalytic chemical vapor deposition method” [1-3] will be described because it is expected that these tubes are thermally and structurally stable, and also contain small-sized tubes (below 2 nm). Among the recent applications of carbon nanotubes, electronic, structural and bio-medical applications [4] will be discussed. It is envisaged that carbon nanotubes will play an important role in the development of nano-technology in the near-future.

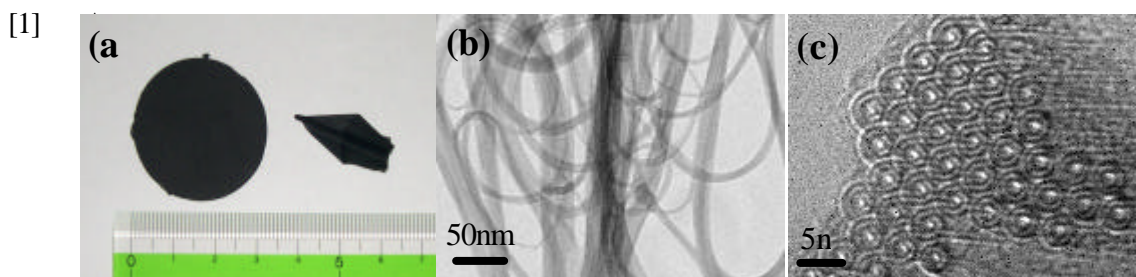


Fig. 1. Catalytically-grown high purity double walled carbon nanotubes: (a) Photographs of DWNTs sheet, (b) low resolution TEM image and (c) cross-

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