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Carbon Nnano Tubes: Past, Present and Future Trends

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Nanotechnology is a group of emerging technologies in which the structure of matter is controlled at the nanometre scale, to produce new, interesting materials and devices with unique properties. Nanotubes belong to the promising group of nanostructured materials. Though there are many other tubes based on boron nitride and molybdenum but carbon nanotubes (CNTs) are most important group. Carbon nanotubes are among the most anisotropic materials ever produced. These molecular-scale tubes of graphitic carbon are one of the stiffest and strongest fibers known. Besides, they have remarkable electronic, optical, thermal and chemical properties. For these reasons their interest in both academic and industrial areas is unique. The CNTs find applications in the field of conductive polymers, advanced composites, fibers, displays, etc. They are characterized as single wall carbon nanotubes (SWCNTs) and multiwalled carbon nanotubes (MWCNTs). Development of efficient processes and chemical treatments that is able to control the quality of the CNT samples and to induce both their dispersion and partial or complete debundling remains highly challenging. As far as the role of CNTs in the fields of pharmacy and medicine is concerned, they can be used as vehicle for drug delivery, in cancer and infection treatments, in gene therapy etc. CNTs can attach covalently to amphotericin B and transport it into mammalian cells. This conjugate has reduced the antifungal toxicity about 40% as compared to the free drug.