

SYNTHESIS OF DENDRIMER-CARBON NANOTUBE CONJUGATES

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Carbon Nanotubes (CNTs) have interesting physical and chemical properties that open attractive possibilities in many research areas. The main problem for further applications is the chemical inertness of the CNTs that makes difficult the attachment of molecules at the surface. The objective of our work is a high degree of functionalization on CNTs with a covalent attachment of the interesting molecules without provoking damage to the conjugated π -system. One approach is the attachment of dendrimers at the SWNTs with high density of functional groups that serve as anchor point for further reactions. For that, we have carried out a primary modification with 1,3 dipolar cycloaddition reaction [1] with different kinds of commercial CNTs. Once the terminal Boc groups were deprotected and the amount of functionalities was quantified in each sample, the most reactive CNTs were chosen. Finally, dendrimers attachments were performed by carbodiimide chemistry and in all cases the final products were fully characterized.

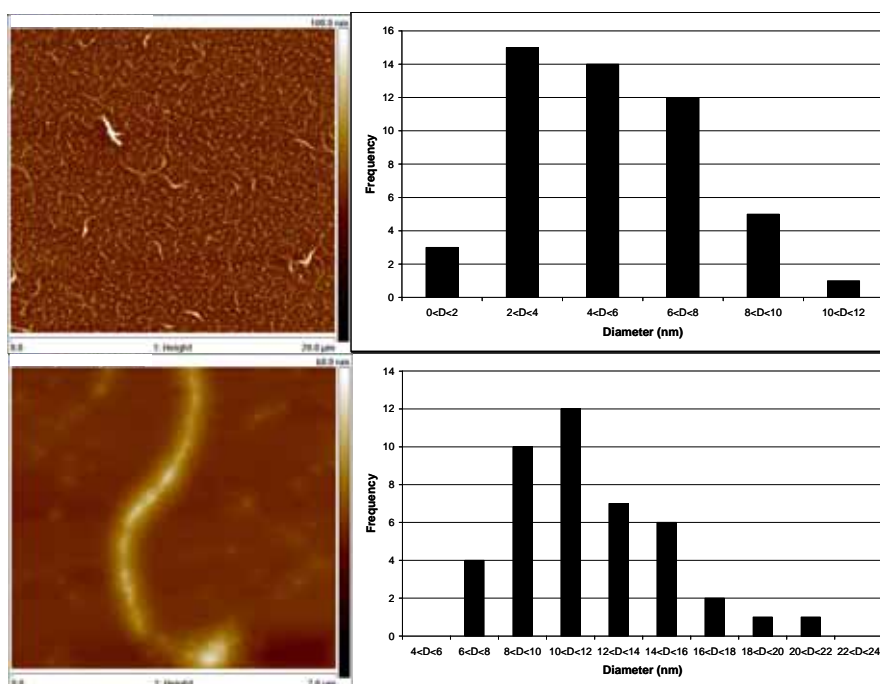


Figure 1. AFM image of SWNT modified with the cycloaddition reaction and diameter distribution of the sample (top) and that of the SWNT- dendrimer conjugated (down).

References:

- [1] (a) Georgakilas, V., Kordatos, K., Prato, M., Guldi, D.M., Holzinger, M., Hirsch, A., *J. Am. Chem. Soc.*, **124** (2002) 760. (b) Georgakilas, V., Tagmatarchis, N., Pantarotto, D., Bianco, A., Briand, J.-P., Prato, M., *Chem. Commun.*, **24** (2002), 3050