

Controlled Networks of Single-Walled Carbon Nanotubes (SWNTs) Arrays by Functionalized Magnetic Microbeads under Ultra-Low Magnetic Field

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Abstract

We have developed a simple method for fabrication of well-aligned single-walled carbon nanotubes (SWNTs) with a controlled manner by using functionalized magnetic microbeads under ultra-low magnetic field. The functionalized SWNTs with biotin (5mg) were incubated with streptavidin-conjugated magnetic microbeads (1-2 μ m in diameter, 2mg) in phosphate buffered saline (PBS) buffer and aligned horizontal or crossed-networks of SWNTs rope array onto the silicon wafer under 0.5 T. The successful well-aligned SWNTs rope arrays with multi-layer film was observed by scanning electron microscopy (SEM), optical microscopy (OM) and transmission electron microscopy (TEM). By changing the orientation and location of the substrate, we observed that the crossed-networks of SWNTs arrays can also be fabricated in our system. These results suggested that this approach should be useful for fabrication of length and diameter-controlled SWNTs arrays and nanodevices with desired the orientation and location.

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Reference

[1] Ijima, S. *Nature* 1991, 353, 56.