

549a Directed Assembly of Single-Walled Carbon Nanotubes at Liquid-Liquid Interfaces; Carbon Nanotubes as Nanoscale Conveyors for Interfacial Biocatalysis

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The unique structural, electronic, and mechanical properties of carbon nanotubes, and resulting applications ranging from nanocomposites to sensors have attracted great attention in recent years. Many of these applications would benefit from the controlled assembly of nanotubes into 2D and 3D structures. Fluid-fluid interfaces, in particular, provide unique platforms for directing such assembly. Herein, we report that native single-walled carbon nanotubes (SWNTs) can be directed to aqueous-organic interfaces with the aid of surfactants. We also demonstrate that this phenomenon can be used to transport enzymes adsorbed onto SWNTs from the bulk aqueous phase to the interface, thereby enhancing the rate of interfacial biotransformations by over three orders of magnitude.