Characterization of single-walled carbon nanotubes aligned by alternating current dielectrophoresis

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Interests in single-walled carbon nanotubes (SWNTs) have been growing rapidly for the past several years due to their great mechanical and electrical properties. In spite of their great properties, alignment of SWNTs is one of the most difficult but necessary researches for potential applications in nanoscale circuits, CNT-based gas sensors and biosensors. Recently, several research groups have suggested different routes for aligning SWNTs such as air flow technique, atomic force microscopy alignment technique, alternating current (AC) dielectrophoresis technique. In this research, we demonstrate the feasibility of SWNTs alignment method using AC dielectrophoresis under different conditions. The surface and electrical characterization results are obtained after SWNTs alignment on the electrodes. Additionally, the possibility of future application of aligned SWNTs will be discussed.