Patterning Mechanism of Carbon Nanotubes Using Surface Acoustic Waves: Acoustic Radiation Effect or Dielectrophoretic Effect

Electronic Supplementary Material

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Supplementary Figure and Table



Figure S1 CNTs pattern transferred onto PDMS (a: 20X and b: 40 X). The scale bars are all 50 μ m.

Properties	Carbon	Polystyrene	Aqueous
	nanotubes	particles	medium
Volume (V, m ³)	1.256e-21	1.130e-16	Not applicable
Density (ρ , kg/m ³)	1600	1050	1000
Speed of Sound (c,m/s)	22300	2350	1484
Absolute permittivity (ε ,	8.854e-11	2.302e-11	7.083e-10
F/m)			
Electrical conductivity	8.23e8	8.67e-4	7.5e-5
(σ, S/m)			
Electric field angular		8.23e7	
frequency (ω , rad/s)			

Table S1 Parameters in the force calculation

Supplementary Videos

Supplementary Video 1: CNT patterning process is recorded at 40X magnification. The surface acoustic wave is turned on in 3 seconds and two lines of assembled CNT bundles form on the substrate surface.

Supplementary Video 2: The water evaporation process of mixing suspension with CNTs and polystyrene particles is recorded at 40X magnification. It is clearly seen that the polystyrene particles pattern is washed away; while the CNTs pattern is well retained. The surface acoustic wave is turned on through the entire video.