

CARBON MICROFACTORY – MICROFLUIDICS FOR SORTING CARBON NANOTUBES

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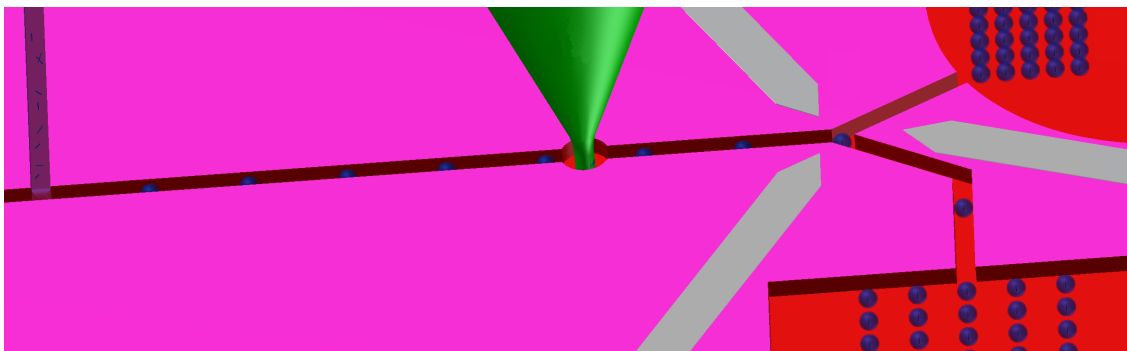
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Wide utilization of single-walled carbon nanotubes (SWCNTs) was forecasted already long time ago. Their unique electronic properties offer a possible way for further down-sizing in transistor based technology [1] as well as new solutions in electronics, sensors, displays, etc. Unfortunately, the advent of SWCNT-based technologies is strongly impeded by lack of knowledge in preparation of nanotube ensembles with identical properties [2].

Here we present a novel approach amongst currently known protocols for sorting uniform fractions of SWCNTs from synthesized blend. The emulsification of individualized, water dispersed SWCNTs in oil phase brings the possibility of single SWCNT manipulation within a microfluidic chip as they are confined in stable droplets. These droplets undergo spectroscopic characterization, defining the nanotube inside. The droplets are then sorted in dielectrophoretic valves based on automated decision algorithms. In this way we aim for obtaining very pure single-type SWCNTs.



[1] Nougaret, L. *et al.*, Appl. Phys. Lett. 94, 243505 (2009), doi: [10.1063/1.3155212](https://doi.org/10.1063/1.3155212)

[2] Hersam, M. C., Nat. Nanotech. 3, 387 - 394 (2008), doi: [10.1038/nnano.2008.135](https://doi.org/10.1038/nnano.2008.135)