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Processing of SWNT Dispersions – Microfluidic Processing vs. Ultrasonication TAO LIU, SIDA LUO, CHUCK ZHANG, BEN WANG, High Performance Materials Institute, Florida State University — Ultrasonication is the most commonly used processing technique for dispersing SWNTs in various media. High-power sonication enables the desired dispersability enhancement and the exfoliation of large SWNT bundles to smaller and even individual tubes. However, one disadvantage for this process is that the SWNT particles can be cut to shorter length. Using a newly developed characterization technique by us for quantifying the structures of SWNTs in a dispersion, we investigated the structural changes of SWNTs due to two different dispersion processing techniques, namely, microfluidic processing and ultrasonication. As a result, the microfluidic processing method shows significantly improved exfoliation efficiency as compared to ultrasonication. Moreover, the length of the exfoliated SWNT particles is maintained upon microfluidic processing, in contrast to the cutting effect caused by the high power sonication. In this presentation, we will discuss in-depth on the processing-structure-property relationships of SWNT dispersions processed by these two different processing methods.

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