High-concentration Dispersion of Single-wall Carbon Nanotubes

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We report a novel method to exfoliate and disperse single-wall carbon nanotubes (SWNTs) into organic and aqueous solutions. The method is based on treatment of SWNTs with a solution of hydroxylamine hydrochloric acid salt [(NH₂OH)(HCl)] and does not require truncation of the tubes or surface absorption of organic molecules. The solution-dispersed tubes can easily be incorporated into an organic matrix in order to obtain a nanocomposite. We illustrate the method by forming PMMA-SWNT and PS-SWNT nanocomposites. One percent of the SWNT-PMMA nanocomposites, having a draw ratio of ~6, showed a dramatic six times increase in the strain to fracture, compared to fibers of similar draw ratio made from pure PMMA [1].

REFERENCES: