

Supporting Information

Aggregation Kinetics of Multiwalled Carbon Nanotubes in Aquatic Systems: Measurements and Environmental Implications

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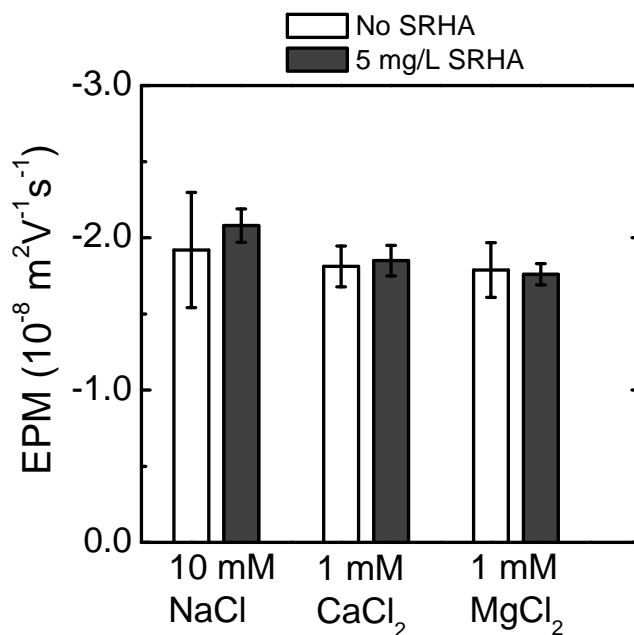


FIGURE S1. Electrophoretic mobility (EPM) of MWNTs in the absence and presence of 5 mg/L Suwannee River humic acid (SRHA). pH for the SRHA was preadjusted to 6.0. Temperature for all EPM measurements was kept at 24 °C. Solution pH for runs without SRHA was unadjusted (6.0 ± 0.2).

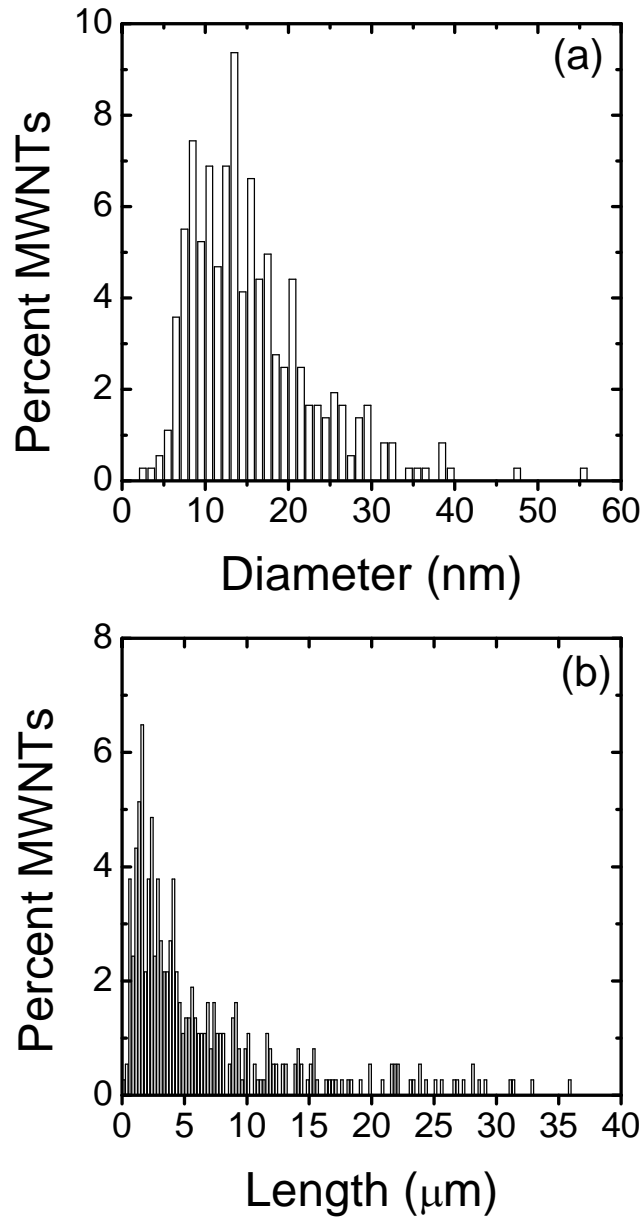


FIGURE S2: MWNT (a) diameter distribution and (b) length distribution before treatment as obtained from TEM imaging. More than 100 tubes were measured for each plot to obtain the distribution. The average diameter after treatment was measured as 15.3 ± 7.4 nm and average length was measured as 6.6 ± 6.8 μm.

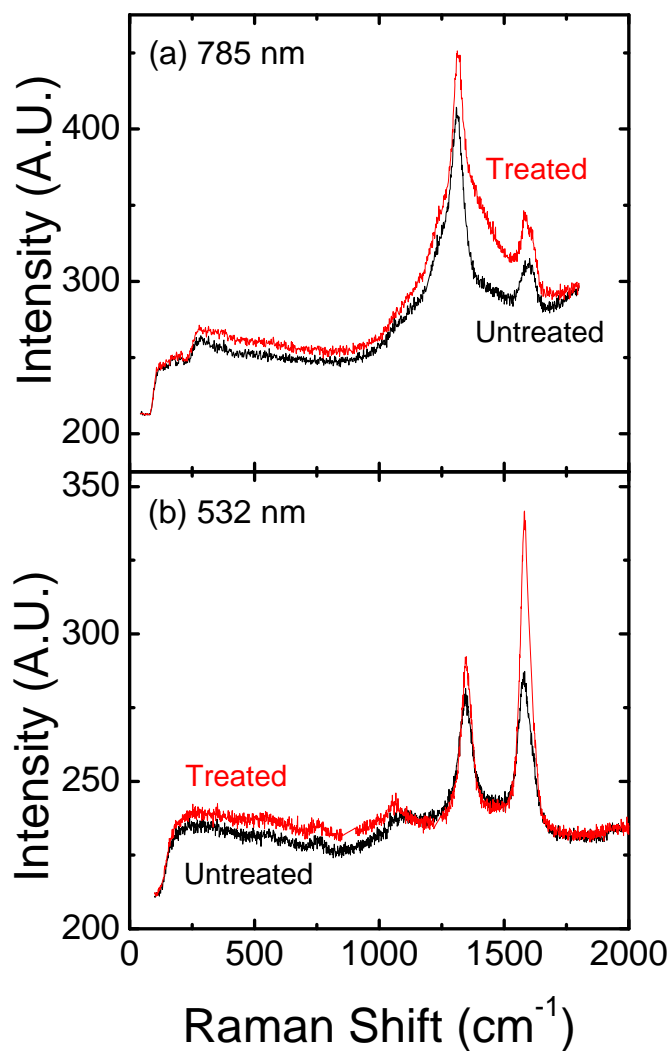


FIGURE S3. Raman spectra of MWNTs before and after sonication treatment (a) at 785 nm and (b) at 532 nm. There is no resolved peak for the breathing mode at or near 200 cm⁻¹, which is indicative of little or no existence of SWNTs. The G/D ratios for the top spectra are 0.24 and 0.18 for untreated and treated cases, respectively. The G/D ratios for the bottom spectra are 1.95 and 1.96 for untreated and treated cases, respectively.

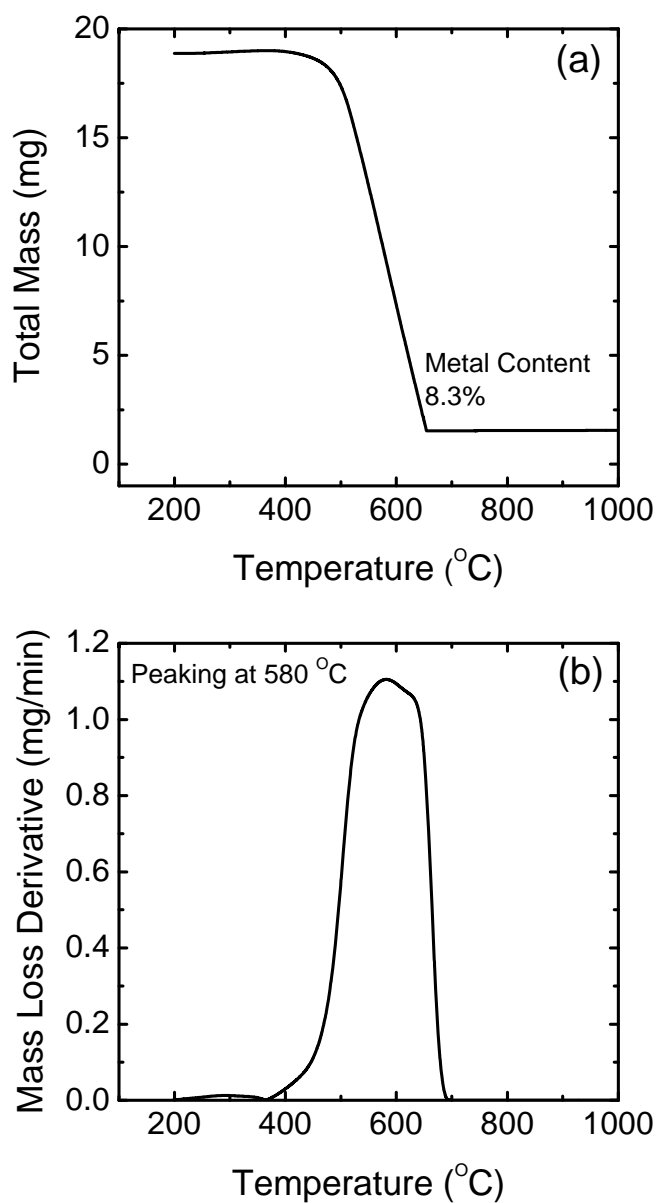


FIGURE S4. TGA (a) mass loss profile and (b) derivative curve of MWNT samples. As prepared, 18.87 g of MWNT sample was used for the TGA measurements. The residual mass was 1.56 g (8.3%) after burning at 1000 °C and is considered to be residual metal catalyst. The sample had a small peak (0.7% of the total integrated area under the peaks) near 300 °C, indicative of amorphous carbon.

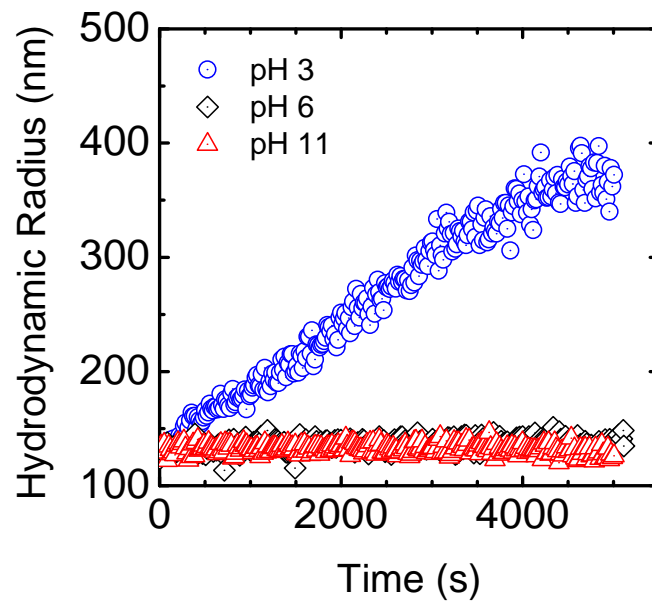


FIGURE S5. MWNT aggregation profiles as a function of pH in the presence of 1 mM background NaCl. Aggregation experiments were carried out at room temperature (23 °C).

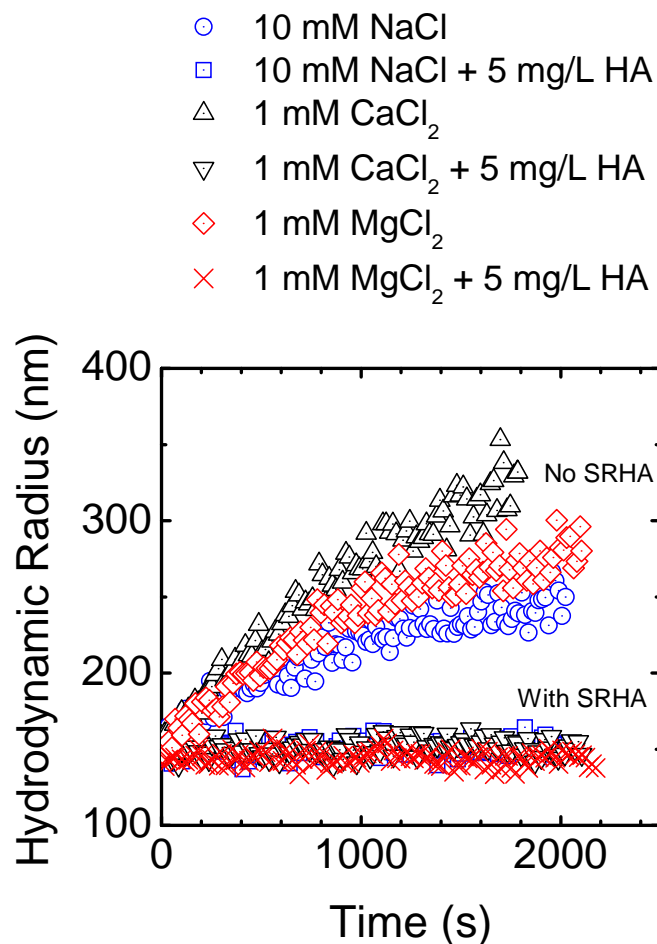


FIGURE S6. MWNT aggregation profiles in the absence and presence of 5 mg/L SRHA at different electrolyte solutions. pH for the SRHA solutions was preadjusted to 6.0. Temperature for all EPM measurements was kept at 23 °C. Solution pH for runs without SRHA was unadjusted (6.0 ± 0.2).