Supporting Information

Natural Organic Matter (NOM) Adsorption to Multi-Walled Carbon Nanotubes: Effect of NOM Characteristics and Water Quality Parameters

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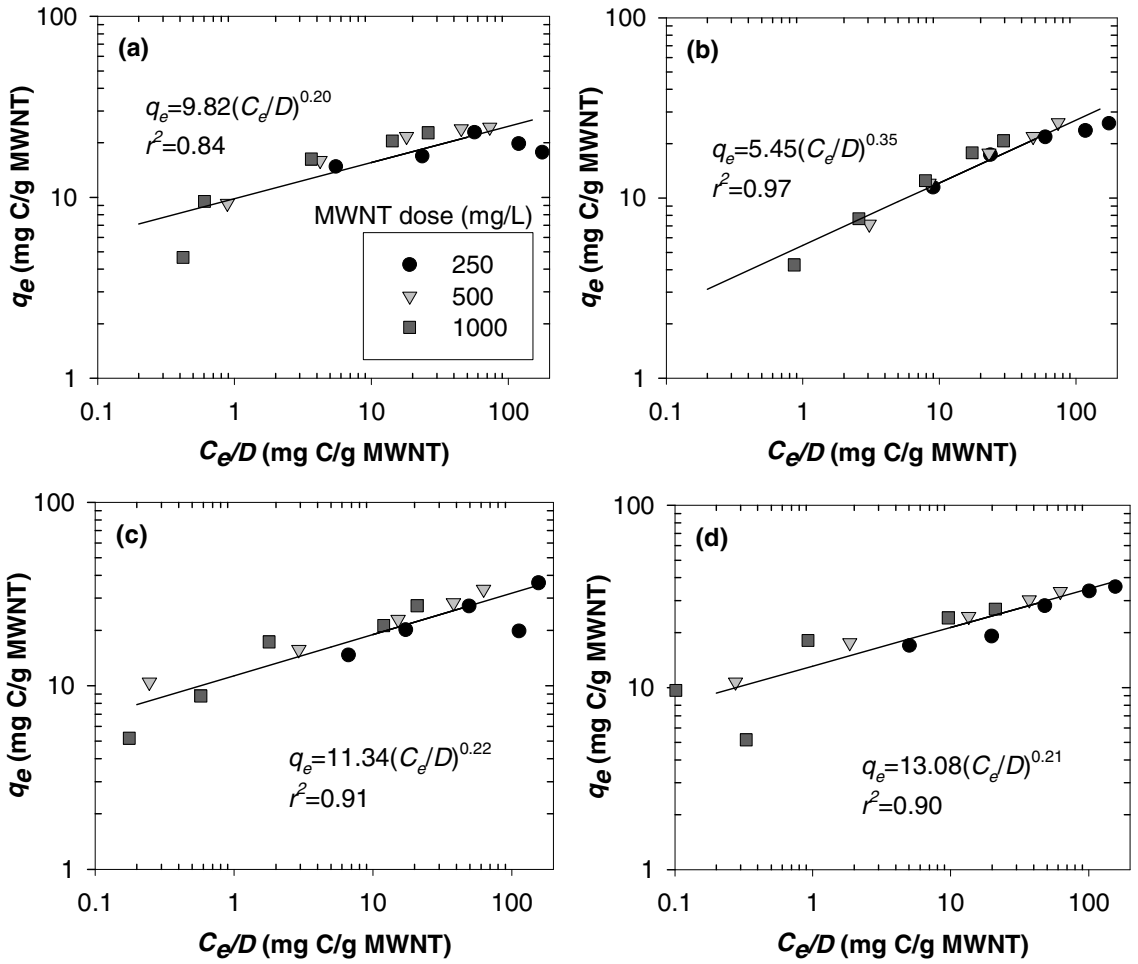
4 Figures and 2 Tables in 7 pages (including cover)


(a)
q_e=9.82(C_e/D)$^{0.20}$
r^2=0.84
MWNT dose (mg/L)
250
500
1000
(b)
q_e=5.45(C_e/D)$^{0.35}$
r^2=0.97
(c)
q_e=11.34(C_e/D)$^{0.22}$
r^2=0.91
(d)
q_e=13.08(C_e/D)$^{0.21}$
r^2=0.90
q_e (mg C/g MWNT)
C_e/D (mg C/g MWNT)
100
10
1
0.1
1
10
100

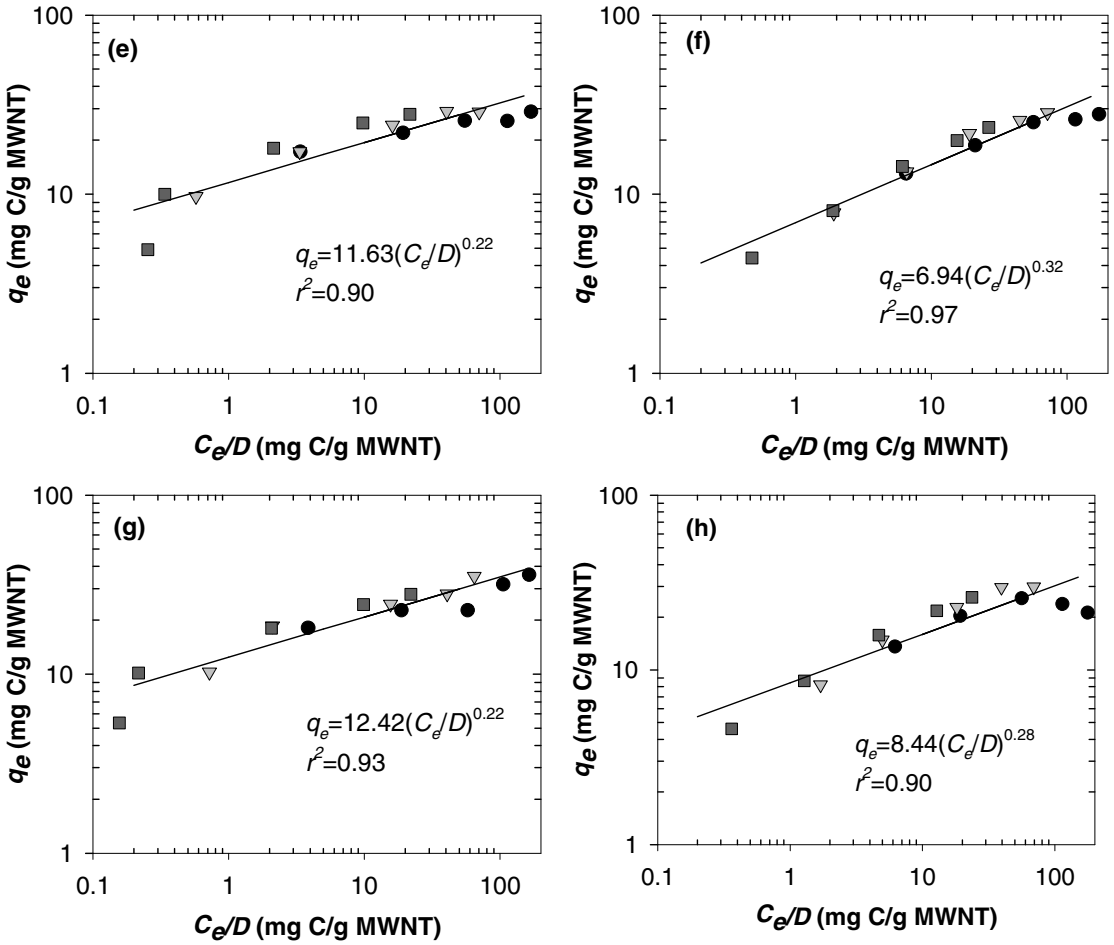


Figure S1. Isotherm experimental result and Freundlich adsorption model fit for (a) SRHA, (b) SRFA, (c) ESHA, (d) LHA, (e) NLHA, (f) NLFA, (g) WPHA, and (h) WPFA. (Isotherm experimental condition: pH 7, 5 mM NaCl, and 1 mM NaH_2PO_4)

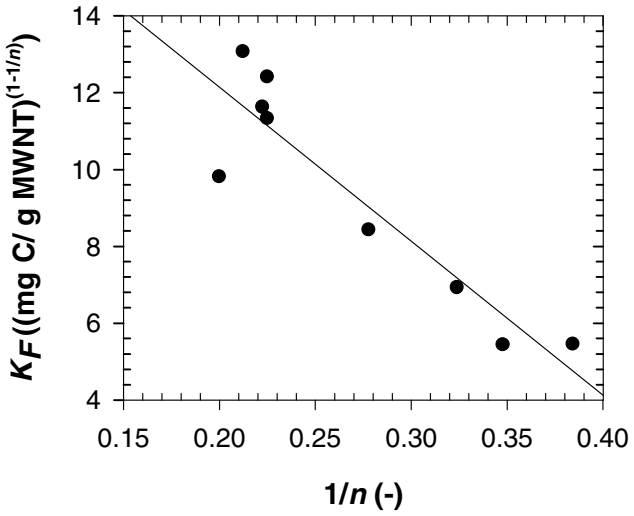


Figure S2. Correlation between K_F and $1/n$ for various NOMs.

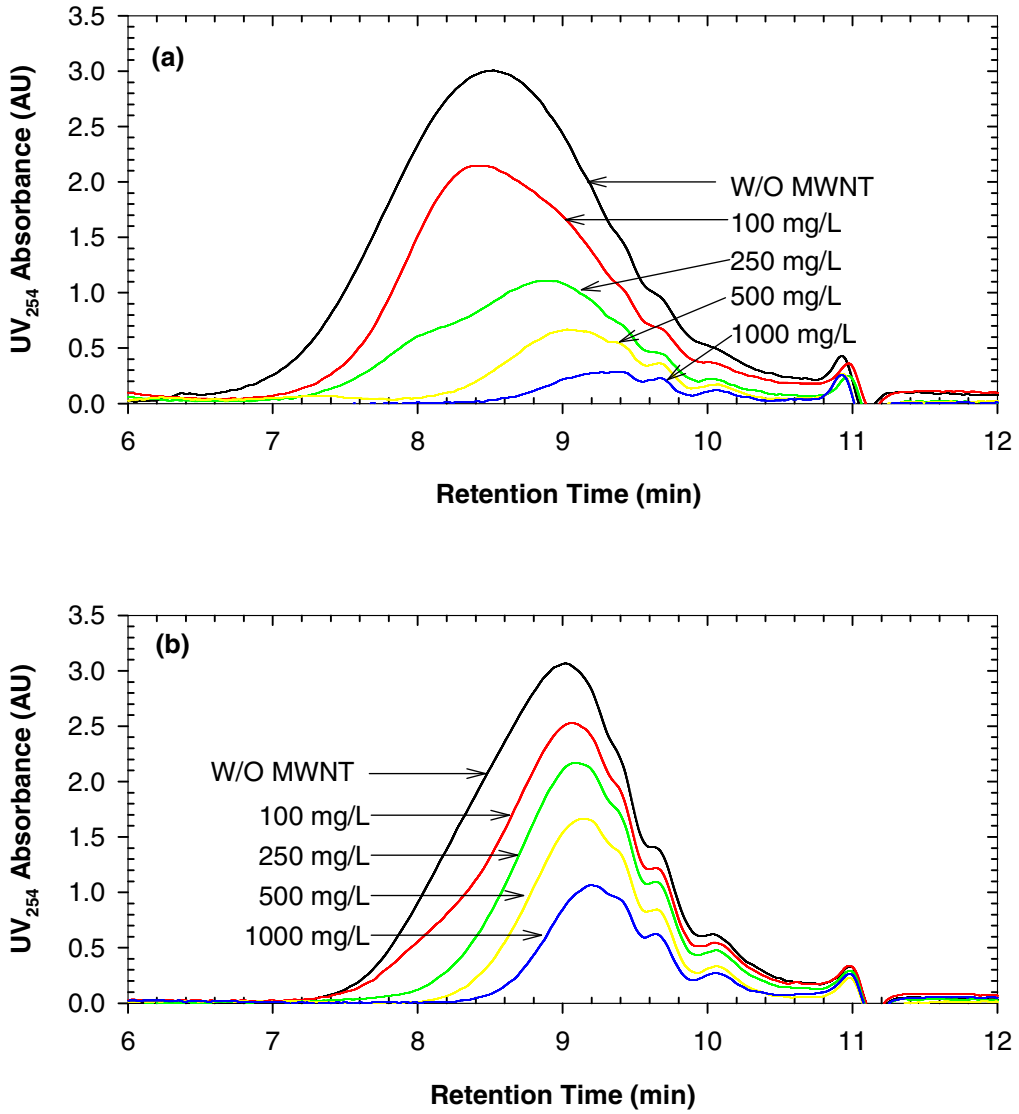


Figure S3. Change of molecular weight distribution by MWNT dose for (a) SRHA and (b) SRFA.

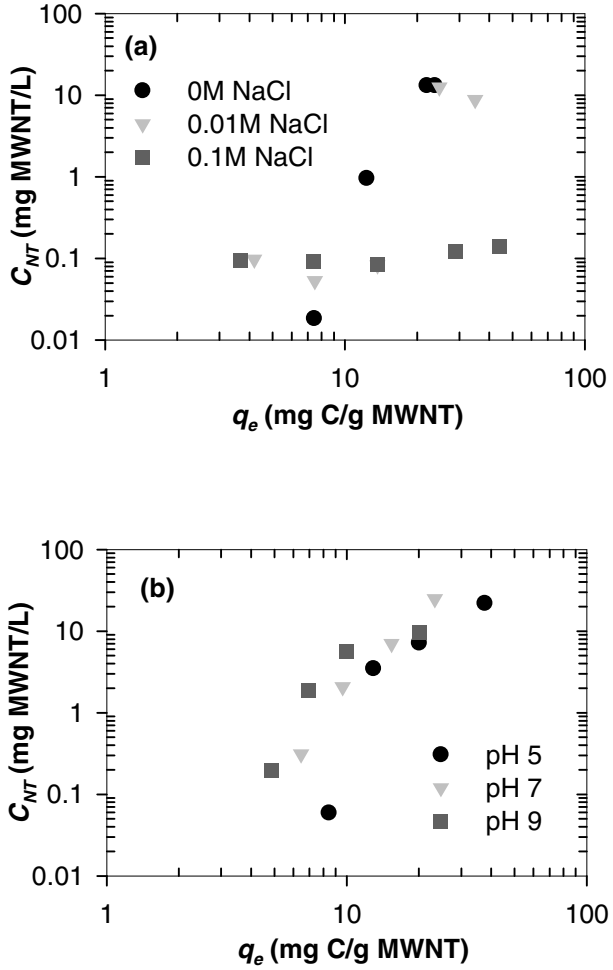


Figure S4. Effect of (a) ionic strength (at 22 ^{o}C, pH 7.0, [NaH_2PO_4] = 1 mM) and (b) pH (at 22 ^{o}C, [NaCl] = 5 mM, [NaH_2PO_4] = 1 mM) on the amount of MWNT suspended in water.

Table S1. Carbon Distribution and Elemental Composition of NOMs Investigated in This Study. Data Are Excerpted from International Humic Substances Society (IHSS) webpage (www.ihss.gatech.edu).

	Carbon Distribution						Elemental Composition						
	Carbonyl	Carboxyl	Aromatic	Acetal	Heteroaliphatic	Aliphatic	H_2O	Ash	C	H	O	N	S
SRHA	6	15	31	7	13	29	20.4	1.04	52.63	4.28	42.04	1.17	0.54
ESHA	6	18	50	4	6	16	8.2	0.88	58.13	3.68	34.08	4.14	0.44
LHA	8	15	58	4	1	14	7.2	2.58	63.81	3.7	31.27	1.23	0.76
SRFA	5	17	22	6	16	35	16.9	0.58	52.34	4.36	42.98	0.67	0.46
NLHA	10	19	38	7	11	15	9.1	0.31	53.33	3.97	43.09	1.16	0.58
WPHA	8	18	42	6	8	18	6.93	1.6	54.72	4.04	38.54	1.47	0.36
NLFA	10	24	31	7	12	18	9.2	0.45	52.31	3.98	45.12	0.68	0.46
WPFA	7	19	36	6	12	20	8.29	0.16	53.63	4.24	41.81	1.07	0.29
SRNOM	8	20	23	7	15	27	8.15	7	52.47	4.19	42.69	1.1	0.65

Table S2. Conditions for Adsorption Experiments.

Effect of NOM Type

C_0: 2.5, 5, 10, 25, 50 mg/L

D: 250, 500, 1000 mg/L

22 ^{o}C, pH=7.0, [NaCl] = 5 mM, [NaH_2PO_4] = 1 mM

Effect of Water Quality (Ionic Strength)

C_0: 2.5, 5, 10, 25, 50 mg/L

D: 500 mg/L

22 ^{o}C, pH 7.0, [NaH_2PO_4] = 1 mM

Effect of Water Quality (pH)

C_0: 2.5, 5, 10, 25, 50 mg/L

D: 500 mg/L

22 ^{o}C, [NaCl] = 5 mM, [NaH_2PO_4] = 1 mM