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*Supplement of*

## **Distinguishing molecular characteristics of aerosol water soluble organic matter from the 2011 trans-North Atlantic US GEOTRACES cruise**

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**Table S1.** 2011 US GEOTRACES cruise aerosol particulate sample identifications, sampling dates, sampling locations, and volumes of air filtered.

<b>GEOTRACES ID</b>	<b>Air Mass Classification ID</b>	<b>Sampling Dates</b>	<b>Start Location (Lat, Long)</b>	<b>End Location (Lat, Long)</b>	<b>Volume of Air Filtered (m<sup>3</sup>)</b>
6250	N Am1	11/7-8/2011	39.71, -69.87	39.70, -69.80	1188
6319	N Am2	11/8-9/2011	39.70, -69.80	39.35, -69.54	967
6452	N Am3	11/9-11/2011	39.35, -69.54	38.65, -69.20	1899
6546	N Am4	11/12-13/2011	38.33, -68.87	38.36, -68.86	1479
6677	N Am5	11/13-15/2011	38.36, -68.86	37.58, -68.40	1960
6788	Mar4	11/15-17/2011	37.62, -68.38	37.62, -68.38	552
6903	N Am 6	11/19-20/2011	32.02, -64.44	31.75, -64.17	1556
6964	N Am 7	11/20-21/2011	31.75, -64.17	31.55, -63.43	1233
7156	Mar5	11/21-24/2011	31.53, -63.37	29.70, -56.82	2189
7245	Mar6	11/24-26/2011	29.70, -56.82	27.58, -49.63	2099
7316	Mar7	11/26-27/2011	27.58, -49.63	27.55, -49.55	1275
7357	Mar8	11/27-28/2011	27.55, -49.55	26.31, -45.39	1706
7426	Mar9	11/28-29/2011	26.28, -45.30	26.14, -44.83	1641
7509	Mar10	11/29-30/2011	26.14, -44.83	25.58, -43.60	1672
7587	Mar11	11/30-12/1/2011	25.55, -43.54	24.15, -40.22	1520
7655	N Am8	12/1-2/2011	24.15, -40.22	24.15, -40.22	1583
7697	Mar12	12/2-3/2011	24.15, -40.22	22.70, -36.73	1041
7791	N Afr9	12/3-4/2011	22.70, -36.73	22.36, -35.87	1441

<b>GEOTRACES ID</b>	<b>Air Mass Classification ID</b>	<b>Sampling Dates</b>	<b>Start Location (Lat, Long)</b>	<b>End Location (Lat, Long)</b>	<b>Volume of Air Filtered (m<sup>3</sup>)</b>
7860	N Afr10	12/4-5/2011	22.36, -35.87	22.38, -35.87	1166
7899	N Afr11	12/5-6/2011	22.37, -35.62	20.88, -32.62	1518
7946	N Afr12	12/6-7/2011	20.88, -32.62	19.43, -29.38	1829
8004	N Afr13	12/7-8/2011	19.43, -29.38	19.43, -29.38	1397
8044	N Afr14	12/8-9/2011	19.43, -29.38	18.13, -26.13	1264
8045	N Afr15	12/9/2011	17.75, -25.31	17.40, -24.53	432

**Table S2.** Average organic matter molecular characteristics for the 2011 US GEOTRACES cruise aerosol particulate samples by number and weighted by spectral intensity.

Sample		O/C	H/C	AI <sub>mod</sub>		CHO	CHON	CHOS	CHONS	CHOP	CHONP	CHOSP
N Am1	Number				Number	1523	842	902	229	130	52	0
	Number Ave	0.49	1.49	0.12	Number %	41%	23%	25%	6.2%	3.5%	1.4%	0.0%
	Weighted Ave	0.49	1.53	0.10	Weighted %	48%	16%	29%	4.6%	2.0%	0.8%	0.0%
N Am2	Number				Number	1686	949	1089	425	129	56	5
	Number Ave	0.53	1.42	0.16	Number %	39%	22%	25%	9.8%	3.0%	1.3%	0.1%
	Weighted Ave	0.55	1.47	0.12	Weighted %	44%	14%	32%	8.1%	1.3%	0.6%	0.1%
N Am3	Number				Number	1190	444	881	239	145	30	0
	Number Ave	0.46	1.52	0.12	Number %	41%	15%	30%	8.2%	5.0%	0.1%	0.0%
	Weighted Ave	0.46	1.55	0.11	Weighted %	40%	9.3%	36%	7.0%	6.7%	0.1%	0.0%
N Am4	Number				Number	2142	1298	649	187	190	37	15
	Number Ave	0.51	1.34	0.19	Number %	47%	29%	14%	4.1%	4.2%	0.8%	0.3%
	Weighted Ave	0.51	1.35	0.18	Weighted %	59%	21%	14%	2.5%	2.2%	0.4%	0.2%
N Am5	Number				Number	1419	417	599	31	236	33	10
	Number Ave	0.47	1.39	0.18	Number %	52%	16%	21%	1.0%	8.3%	1.2%	0.4%
	Weighted Ave	0.47	1.40	0.17	Weighted %	60%	11%	20%	0.7%	6.1%	1.1%	0.4%
Mar4	Number				Number	545	61	140	41	76	39	43
	Number Ave	0.37	1.45	0.20	Number %	58%	6.5%	15%	4.3%	8.0%	4.1%	4.6%
	Weighted Ave	0.37	1.41	0.22	Weighted %	58%	5.9%	13%	4.5%	8.2%	4.0%	5.7%
N Am 6	Number				Number	917	933	199	32	67	113	0
	Number Ave	0.35	1.59	0.11	Number %	41%	41%	8.8%	1.4%	3.0%	5.0%	0.0%
	Weighted Ave	0.34	1.64	0.10	Weighted %	36%	49%	5.7%	1.2%	2.1%	6.0%	0.0%
N Am 7	Number				Number	843	1418	474	103	176	177	0
	Number Ave	0.33	1.65	0.10	Number %	26%	44%	15%	3.2%	5.5%	5.5%	0.0%
	Weighted Ave	0.30	1.69	0.08	Weighted %	24%	58%	8.0%	2.6%	2.9%	4.7%	0.0%
Mar5	Number				Number	885	233	629	56	259	98	8
	Number Ave	0.35	1.56	0.14	Number %	41%	11%	29%	2.6%	12%	4.5%	0.4%
	Weighted Ave	0.34	1.56	0.14	Weighted %	44%	7.5%	32%	2.2%	9.4%	4.2%	0.2%
Mar6	Number				Number	599	109	552	66	71	49	11

	Number Ave	0.36	1.54	0.15	Number %	41%	7.3%	38%	4.6%	4.9%	3.5%	0.7%
	Weighted Ave	0.37	1.56	0.15	Weighted %	33%	4.4%	46%	7.7%	3.9%	4.3%	0.6%
Mar7	Number				Number	769	147	683	47	200	54	10
	Number Ave	0.33	1.60	0.12	Number %	40%	7.7%	36%	2.5%	10%	2.8%	0.5%
	Weighted Ave	0.33	1.60	0.12	Weighted %	40%	5.2%	42%	2.4%	7.9%	2.1%	0.4%
Mar8	Number				Number	640	23	328	23	61	20	11
	Number Ave	0.41	1.53	0.14	Number %	58%	2.1%	30%	2.1%	5.5%	1.8%	1.0%
	Weighted Ave	0.41	1.55	0.13	Weighted %	58%	1.7%	32%	1.6%	4.4%	1.7%	1.1%
Mar9	Number				Number	528	43	305	20	47	23	7
	Number Ave	0.37	1.54	0.15	Number %	54%	4.4%	31%	2.1%	4.8%	2.4%	0.7%
	Weighted Ave	0.37	1.54	0.15	Weighted %	56%	3.8%	32%	2.0%	4.1%	2.2%	0.7%
Mar10	Number				Number	597	68	347	38	97	41	20
	Number Ave	0.34	1.55	0.15	Number %	49%	5.6%	29%	31%	8.0%	3.4%	1.7%
	Weighted Ave	0.33	1.52	0.16	Weighted %	45%	6.8%	32%	26%	8.2%	3.5%	1.3%
Mar11	Number				Number	768	229	264	48	205	87	14
	Number Ave	0.34	1.60	0.11	Number %	48%	14%	16%	3.0%	13%	5.4%	0.9%
	Weighted Ave	0.33	1.61	0.11	Weighted %	51%	14%	15%	3.2%	10%	5.8%	0.7%
N Am8	Number				Number	829	62	412	16	175	21	0
	Number Ave	0.39	1.53	0.13	Number %	55%	4.1%	27%	1.1%	12%	1.4%	0.0%
	Weighted Ave	0.39	1.52	0.14	Weighted %	59%	2.9%	26%	1.7%	8.8%	1.2%	0.0%
Mar12	Number				Number	565	69	327	25	45	28	10
	Number Ave	0.39	1.57	0.13	Number %	53%	6.4%	31%	2.3%	4.2%	2.6%	0.9%
	Weighted Ave	0.40	1.60	0.12	Weighted %	33%	4.4%	46%	7.7%	3.9%	4.3%	0.6%
N Afr9	Number				Number	1023	222	182	6	105	33	6
	Number Ave	0.38	1.51	0.14	Number %	65%	14%	12%	0.4%	6.7%	2.1%	0.4%
	Weighted Ave	0.37	1.51	0.15	Weighted %	69%	13%	10%	0.3%	5.0%	1.9%	0.4%
N Afr10	Number				Number	1615	404	299	24	188	9	0
	Number Ave	0.46	1.41	0.18	Number %	64%	16%	12%	0.9%	7.4%	0.4%	0.0%
	Weighted Ave	0.45	1.41	0.17	Weighted %	75%	11%	8.5%	0.7%	4.6%	0.2%	0.0%
N Afr11	Number				Number	1480	558	300	4	95	13	0
	Number Ave	0.46	1.36	0.20	Number %	60%	23%	12%	0.2%	3.9%	0.5%	0.0%

	Weighted Ave	0.48	1.35	0.20	Weighted %	72%	16%	9.3%	0.1%	2.2%	0.4%	0.0%
N Afr12	Number				Number	1370	173	301	13	161	8	5
	Number Ave	0.45	1.41	0.18	Number %	67%	8.5%	15%	0.6%	7.9%	0.4%	0.2%
	Weighted Ave	0.45	1.41	0.18	Weighted %	77%	5.4%	11%	0.5%	5.5%	0.2%	0.1%
N Afr13	Number				Number	1521	247	169	19	141	7	0
	Number Ave	0.47	1.38	0.20	Number %	72%	12%	8.0%	0.9%	6.7%	0.3%	0.0%
	Weighted Ave	0.47	1.37	0.19	Weighted %	81%	7.5%	6.0%	0.6%	4.5%	0.2%	0.0%
N Afr14	Number				Number	1627	277	262	16	162	10	0
	Number Ave	0.49	1.38	0.19	Number %	69%	12%	11%	0.7%	6.9%	0.4%	0.0%
	Weighted Ave	0.49	1.38	0.18	Weighted %	79%	7.3%	8.2%	0.4%	4.6%	0.2%	0.0%
N Afr15	Number				Number	984	66	62	17	88	35	0
	Number Ave	0.46	1.38	0.20	Number %	79%	5.3%	5.0%	1.4%	7.0%	2.8%	0.0%
	Weighted Ave	0.46	1.38	0.20	Weighted %	80%	4.5%	4.9%	1.3%	6.8%	2.6%	0.0%
All					Number	3282	3441	1910	971	1355	686	168
Samples					Number %	28%	29%	16%	8.2%	11%	5.8%	1.4%

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