ADDITIONAL MATERIALS AVAILABLE ON THE HEI WEBSITE

Research Report 197

Cellular and Acellular Assays for Measuring Oxidative Stress Induced by Ambient and Laboratory-Generated Aerosols

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Additional Materials 5
Appendix E: Dithiothreitol Consumption for All Samples

Note: Additional Materials may appear in a different order than in the original Investigators' Report, and some remnants of their original names may be apparent. HEI has not changed the content of these documents, only their numeric identifiers. Additional Materials 5 was originally Appendix E.

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Appendix E: Dithiothreitol consumption for all samples

Table E1. Dithiothreitol consumption for all ambient samples. Ambient samples are named according to collection site and collection date.

Site	Date	DTT (nmol/min/m^3)	DTT (nmol/min/µg)
YRK	06/16/12	0.265	0.0240
YRK	06/25/12	0.201	0.0255
YRK	06/30/12	0.374	0.0421
JST	07/01/12	0.644	0.0279
JST	09/24/12	0.319	0.0698
JST	03/13/13	0.202	0.0356
JST	03/18/13	0.422	0.0381
JST	03/26/13	0.141	0.0209
JST	01/31/13	0.156	0.0425
JST	10/02/12	0.188	0.0529
RS	10/02/13	0.176	0.0151
JST	12/09/12	0.498	0.0446
JST	02/06/13	0.488	0.0325
JST	03/09/13	0.516	0.0535
GT	08/18/12	0.207	0.0228
RS	10/03/13	0.245	0.0204
JST	08/16/12	0.406	0.0276
JST	09/15/12	0.387	0.0401
JST	08/30/12	0.157	0.0267
YRK	06/22/12	0.209	0.0170
JST	06/30/12	0.598	0.0359
JST	07/02/12	0.593	0.0365
JST	08/14/12	0.286	0.0298
JST	08/23/12	0.400	0.0300
JST	02/14/13	0.127	0.0156
YRK	06/29/12	0.435	0.0284
JST	08/21/12	0.383	0.0322
JST	08/25/12	0.291	0.0294

JST	08/26/12	0.372	0.0285
JST	09/30/12	0.366	0.0268
YRK	06/19/12	0.211	0.0152
YRK	06/23/12	0.288	0.0191
JST	12/21/12	0.222	0.0708
JST	03/10/13	0.658	0.0467
JST	03/12/13	0.234	0.0520
JST	12/28/12	0.525	0.0506
JST	01/02/13	0.375	0.0524
YRK	07/10/12	0.279	0.0460
YRK	07/03/12	0.572	0.0368
JST	07/15/12	0.0773	0.0114
JST	12/06/12	0.433	0.0784
GT	08/29/12	0.0784	0.0185
JST	12/16/12	0.581	0.0493
YRK	12/10/12	0.178	0.0512
JST	08/02/12	0.408	0.0245
JST	09/13/12	0.308	0.0338
YRK	06/24/12	0.326	0.0208
YRK	07/02/12	0.348	0.0168
GT	08/27/12	0.202	0.00990
RS	09/30/13	0.256	0.0397
JST	08/31/12	0.145	0.0213
GT	08/31/12	0.0966	0.0139
GT	08/26/12	0.318	0.0155
JST	07/03/12	0.534	0.0353
JST	08/27/12	0.325	0.0263
JST	09/07/12	0.328	0.0278
JST	02/13/13	0.171	0.0380
JST	03/05/13	0.349	0.0331
YRK	07/01/12	0.476	0.0201
JST	07/31/12	0.322	0.0433
JST	08/19/12	0.279	0.0353
JST	01/28/13	0.506	0.0344

YRK	06/14/12	0.261	0.0217
YRK	06/15/12	0.290	0.0231
YRK	06/17/12	0.290	0.0266
JST	02/02/13	0.463	0.0453
JST	09/18/12	0.165	0.0586
JST	12/23/12	0.629	0.0894
JST	03/15/13	0.526	0.0553
YRK	07/15/12	0.330	0.0566
JST	01/04/13	0.494	0.0427
JST	06/16/12	0.190	0.0223
JST	06/19/12	0.337	0.0241
JST	06/25/12	0.145	0.0169
JST	07/13/12	0.228	0.0318
JST	12/07/12	0.476	0.0563
JST	12/08/12	0.523	0.0470
JST	12/11/12	0.198	0.0386
JST	12/15/12	0.585	0.0570
JST	12/17/12	0.335	0.0473
JST	12/22/12	0.176	0.0515
YRK	06/28/12	0.298	0.0238
YRK	07/13/12	0.173	0.0323
YRK	12/07/12	0.375	0.0459
YRK	12/08/12	0.441	0.0402
YRK	12/09/12	0.308	0.0329
YRK	12/11/12	0.173	0.0368
YRK	12/15/12	0.409	0.0534
YRK	12/17/12	0.228	0.100
YRK	12/22/12	0.128	0.123
YRK	12/28/12	0.359	0.0383

Table E2. Dithiothreitol consumption for all laboratory-generated samples. Laboratory-generated samples are named according to precursor identity (isoprene, ISO; α-pinene, AP; β-caryophyllene, BCAR; pentadecane, PD; *m*-xylene, MX; naphthalene, NAPH), formation condition (OH precursor, relative humidity, seed particle), and date of generation. AS: ammonium sulfate seed (15 mM $(NH_4)_2SO_4$); MS + SA: acidic seed (8 mM $MgSO_4$ and 16 mM H_2SO_4); FS: iron sulfate seed (15 mM $FeSO_4$).

Precursor	Formation condition	Date	DTT (nmol/min/m^3)	DTT (nmol/min/µg)
BCAR	H_2O_2, <5%, AS	01/19/16	3.27	0.0143
AP	H_2O_2, <5%, AS	01/23/16	2.40	0.0246
NAPH	H_2O_2, <5%, AS	01/25/16	11.2	0.0922
ISO	H_2O_2, <5%, AS	01/30/16	0.0859	0.0112
PD	H_2O_2, <5%, AS	07/05/16	0.167	0.0122
MX	H_2O_2, <5%, AS	07/01/16	2.62	0.0270
BCAR	H_2O_2, <5%, AS	01/27/16	3.50	0.0165
AP	H_2O_2, <5%, AS	01/31/16	4.25	0.0303
NAPH	H_2O_2, <5%, AS	01/29/16	16.1	0.119
ISO	H_2O_2, <5%, AS	03/20/16	0.0345	0.00900
PD	H_2O_2, <5%, AS	03/22/16	0.0732	0.0127
MX	H_2O_2, <5%, AS	01/26/16	2.14	0.0240
BCAR	H_2O_2, 42%, AS	03/23/16	3.74	0.0163
AP	H_2O_2, 40%, AS	03/25/16	4.46	0.0289
NAPH	H_2O_2, 44%, AS	03/29/16	19.6	0.149
ISO	H_2O_2, <5%, MS + SA	03/31/16	0.185	0.0108
PD	H_2O_2, 45%, AS	03/24/16	0.327	0.0139
MX	H_2O_2, 45%, AS	03/21/16	0.586	0.0421
BCAR	HONO, <5%, AS	04/16/16	0.789	0.0221
AP	HONO, <5%, AS	04/12/16	3.21	0.0193
NAPH	HONO, <5%, AS	05/02/16	29.1	0.205
ISO	HONO, <5%, AS	04/20/16	1.67	0.0113
PD	HONO, <5%, AS	05/10/16	1.38	0.0171
MX	HONO, <5%, AS	04/28/16	3.57	0.0234
NAPH	H_2O_2, 51%, AS	11/22/16	4.29	0.377
NAPH	H_2O_2, 49%, AS	11/18/16	12.8	0.232
NAPH	H_2O_2, 54%, AS	11/16/16	39.1	0.168

NAPH	H_2O_2, 53%, AS	11/20/16	71.6	0.210
NAPH	H_2O_2, 50%, FS	11/23/16	1.22	0.169
NAPH	H_2O_2, 48%, FS	11/19/16	7.03	0.296
NAPH	H_2O_2, 52%, FS	11/15/16	22.9	0.153
NAPH	H_2O_2, 51%, FS	11/21/16	117	0.310

Table E3. Raw data for the dithiothreitol consumption of all laboratory-generated samples. Laboratory-generated samples are named according to precursor identity (isoprene, ISO; α-pinene, AP; β-caryophyllene, BCAR; pentadecane, PD; *m*-xylene, MX; naphthalene, NAPH), formation condition (OH precursor, relative humidity, seed particle), and date of generation. AS: ammonium sulfate seed (15 mM $(NH_4)_2SO_4$); MS + SA: acidic seed (8 mM $MgSO_4$ and 16 mM H_2SO_4); FS: iron sulfate seed (15 mM $FeSO_4$).

Precursor	Formation condition	Date	Time step	DTT ($abs_{412} – abs_{700}$)
BCAR	H_2O_2, <5%, AS	01/19/16	4.2	0.501
			13.6	0.463
			23.0	0.448
			32.4	0.413
			41.8	0.381
AP	H_2O_2, <5%, AS	01/23/16	4.2	0.517
			13.6	0.472
			23.0	0.458
			32.4	0.428
			41.8	0.406
NAPH	H_2O_2, <5%, AS	01/25/16	4.2	0.500
			13.6	0.464
			23.0	0.389
			32.4	0.343
			41.8	0.500
ISO	H_2O_2, <5%, AS	01/30/16	4.2	0.512
			13.6	0.495
			23.0	0.473
			32.4	0.466
			41.8	0.435
PD	H_2O_2, <5%, AS	07/05/16	4.2	0.523
			13.6	0.496
			23.0	0.480
			32.4	0.451
			41.8	0.434
MX	H_2O_2, <5%, AS	07/01/16	4.2	0.498
			13.6	0.467

			23.0	0.432
			32.4	0.396
			41.8	0.360
BCAR	H_2O_2, <5%, AS	01/27/16	4.2	0.501
			13.6	0.478
			23.0	0.438
			32.4	0.416
			41.8	0.373
AP	H_2O_2, <5%, AS	01/31/16	4.2	0.514
			13.6	0.468
			23.0	0.436
			32.4	0.399
			41.8	0.376
NAPH	H_2O_2, <5%, AS	01/29/16	4.2	0.504
			13.6	0.454
			23.0	0.385
			32.4	0.317
			41.8	0.255
ISO	H_2O_2, <5%, AS	03/20/16	4.2	0.549
			13.6	0.576
			23.0	0.536
			32.4	0.483
			41.8	0.463
PD	H_2O_2, <5%, AS	03/22/16	4.2	0.567
			13.6	0.554
			23.0	0.535
			32.4	0.520
			41.8	0.475
MX	H_2O_2, <5%, AS	01/26/16	4.2	0.532
			13.6	0.502
			23.0	0.477
			32.4	0.457
			41.8	0.415
BCAR	H_2O_2, 42%, AS	03/23/16	4.2	0.567

			13.6	0.532
			23.0	0.485
			32.4	0.472
			41.8	0.422
AP	H_2O_2, 40%, AS	03/25/16	4.2	0.544
			13.6	0.489
			23.0	0.435
			32.4	0.395
			41.8	0.384
NAPH	H_2O_2, 44%, AS	03/29/16	4.2	0.364
			13.6	0.238
			23.0	0.103
			32.4	0.056
			41.8	0.056
ISO	H_2O_2, <5%, MS + SA	03/31/16	4.2	0.582
			13.6	0.542
			23.0	0.540
			32.4	0.482
			41.8	0.494
PD	H_2O_2, 45%, AS	03/24/16	4.2	0.549
			13.6	0.531
			23.0	0.532
			32.4	0.498
			41.8	0.451
MX	H_2O_2, 45%, AS	03/21/16	4.2	0.575
			13.6	0.527
			23.0	0.515
			32.4	0.497
			41.8	0.447
BCAR	HONO, <5%, AS	04/16/16	4.2	0.460
			13.6	0.460
			23.0	0.447
			32.4	0.436
			41.8	0.402

AP	HONO, <5%, AS	04/12/16	4.2	0.497
			13.6	0.445
			23.0	0.436
			32.4	0.423
			41.8	0.364
NAPH	HONO, <5%, AS	05/02/16	4.2	0.485
			13.6	0.319
			23.0	0.175
			32.4	0.102
			41.8	0.060
ISO	HONO, <5%, AS	04/20/16	4.2	0.466
			13.6	0.436
			23.0	0.423
			32.4	0.403
			41.8	0.358
PD	HONO, <5%, AS	05/10/16	4.2	0.560
			13.6	0.536
			23.0	0.506
			32.4	0.492
			41.8	0.470
MX	HONO, <5%, AS	04/28/16	4.2	0.496
			13.6	0.467
			23.0	0.438
			32.4	0.390
			41.8	0.370
NAPH	H_2O_2, 51%, AS	11/22/16	4.2	0.299
			13.6	0.275
			23.0	0.242
			32.4	0.210
			41.8	0.175
NAPH	H_2O_2, 49%, AS	11/18/16	4.2	0.292
			13.6	0.265
			23.0	0.239
			32.4	0.217

			41.8	0.191
NAPH	H_2O_2, 54%, AS	11/16/16	4.2	0.286
			13.6	0.266
			23.0	0.240
			32.4	0.210
			41.8	0.181
NAPH	H_2O_2, 53%, AS	11/20/16	4.2	0.283
			13.6	0.260
			23.0	0.229
			32.4	0.199
			41.8	0.166
NAPH	H_2O_2, 50%, FS	11/23/16	4.2	0.309
			13.6	0.302
			23.0	0.263
			32.4	0.248
			41.8	0.172
NAPH	H_2O_2, 48%, FS	11/19/16	4.2	0.298
			13.6	0.264
			23.0	0.214
			32.4	0.160
			41.8	0.112
NAPH	H_2O_2, 52%, FS	11/15/16	4.2	0.283
			13.6	0.255
			23.0	0.229
			32.4	0.195
			41.8	0.164
NAPH	H_2O_2, 51%, FS	11/21/16	4.2	0.275
			13.6	0.234
			23.0	0.183
			32.4	0.141
			41.8	0.098
blank		04/22/16	4.2	0.564
			13.6	0.534
			23.0	0.536

		32.4	0.515
		41.8	0.484
blank	04/20/16	4.2	0.533
		13.6	0.517
		23.0	0.514
		32.4	0.490
		41.8	0.449
blank	12/02/16	4.2	0.286
		13.6	0.281
		23.0	0.267
		32.4	0.261
		41.8	0.247
blank (FS)	12/02/16	4.2	0.293
		13.6	0.279
		23.0	0.263
		32.4	0.247
		41.8	0.225
std	04/20/16	4.2	0.559
		13.6	0.496
		23.0	0.424
		32.4	0.364
		41.8	0.288
std	07/03/16	4.2	0.467
		13.6	0.417
		23.0	0.342
		32.4	0.278
		41.8	0.217
std	12/02/16	4.2	0.296
		13.6	0.285
		23.0	0.273
		32.4	0.268
		41.8	0.249

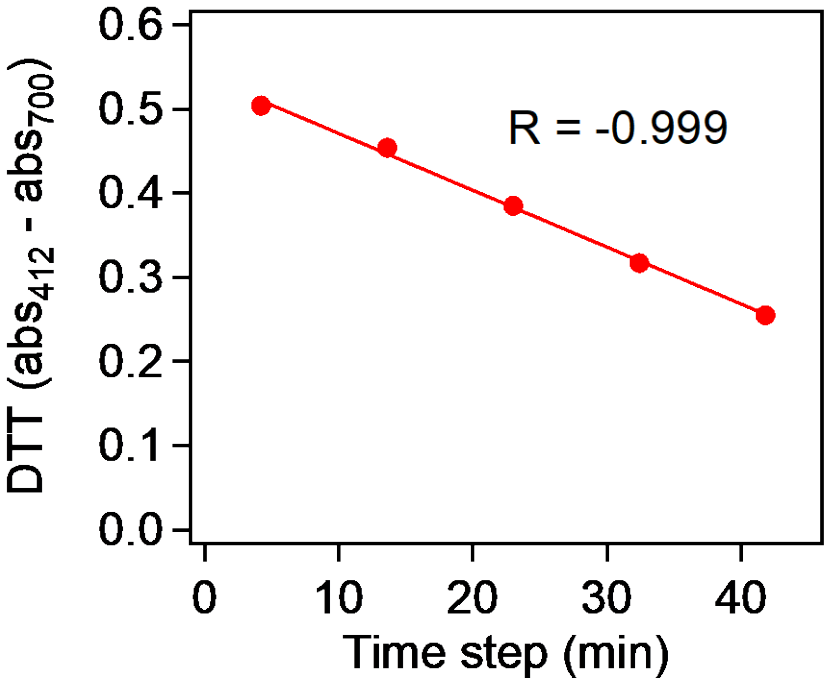

Figure E1. Typical DTT consumption time profile (filter ID: NAPH, H_2O_2, RH < 5%, AS seed, 01/29/16). A simple linear fit is shown (R = -0.999).