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APPENDICES

APPENDIX A

A-1 Chemical Properties of Target VOC Species

Table A-1 Chemical Properties of Target VOC Species

No.	Formula	VOC Species	Molecular Weight (a)	Boiling Point °C (a)	Vapor Pressure mm Hg at 25°C (b)	Rate coefficient (k_{OH} x 10^{12}) cm^3/molecule/sec 1013 mb and 298 K (c)	Lifetime [c] days (e)
1	C_2H_4	Ethene	28	-103.7(subl.)	52163	8.52	2.4
2	C_2H_2	Acetylene	26	-84.7	36476	0.815	25.5
3	C_2H_6	Ethane	30	-88.6	31132	0.257	81.0
4	C_3H_6	Propene	42	-47.6	8691	26.3	0.8
5	C_3H_8	Propane	44	-42.1	7123	1.15	18.1
6	C_4H_{10}	Isobutane	58	-11.7	2627	2.33	8.9
7	C_4H_8	1-Butene	56	-6.2	2215	31.4	0.7
8	C_4H_{10}	n-Butane	58	-0.5	1819	2.52	8.3
9	C_4H_8	trans-2-Butene	56	0.8	1747	64	0.3
10	C_4H_8	cis-2-Butene	56	3.7	1599	56.4	0.4
11	C_5H_{12}	Isopentane	72	27.8	685	3.9	5.3
12	C_5H_{10}	1-Pentene	70	29.9	636	31.4 [d]	0.7
13	C_5H_{12}	n-Pentane	72	36.0	564.0	3.96	5.3
14	C_5H_8	Isoprene	68	34.0	548.0	101	0.2
15	C_5H_{10}	trans-2-Pentene	70	36.3	NA	66.9	0.3
16	C_5H_{10}	cis-2-Pentene	70	36.9	NA	65.4	0.3
17	C_6H_{14}	2,2-Dimethylbutane	86	49.7	NA	2.32 [d]	9.0
18	C_5H_{10}	Cyclopentane	70	49.3	316	5.16 [d]	4.0
19	C_6H_{14}	2,3-Dimethylbutane	86	57.9	233	6.3 [d]	3.3
20	C_6H_{14}	2-Methylpentane	86	60.2	210	5.6	3.7
21	C_6H_{14}	3-Methylpentane	86	63.2	NA	5.7	3.7
22	C_6H_{14}	n-Hexane	86	68.7	151	5.61	3.7
23	C_6H_{12}	Methylcyclopentane	84	71.8	137	10.4 [d]	2.0
24	C_7H_{16}	2,4-Dimethylpentane	100	80.4	NA	6.9	3.0
25	C_6H_6	Benzene	78	80.0	94	1.32	15.8
26	C_6H_{12}	Cyclohexane	84	80.7	98	7.5	2.8
27	C_7H_{16}	2-Methylhexane	100	90.0	NA	6.8	3.1
28	C_7H_{16}	2,3-Dimethylpentane	100	89.7	68	7.2	2.9
29	C_7H_{16}	3-Methylhexane	100	92.0	NA	7.2	2.9
30	C_8H_{18}	2,2,4-Trimethylpentane	114	99.2	49	3.6	5.8
31	C_7H_{16}	n-Heptane	100	98.5	45	7.2	2.9
32	C_7H_{14}	Methylcyclohexane	98	100.9	46	10.4	2.0
33	C_8H_{18}	2,3,4-Trimethylpentane	114	113.5	NA	8.7	2.4
34	C_7H_8	Toluene	92	110.6	28	5.96	3.5
35	C_8H_{18}	2-Methylheptane	114	117.6	NA	8.2	2.5

36	C_8H_{18}	3-Methylheptane	114	118.9	NA	8.6	2.4
37	C_8H_{18}	n-Octane	114	125.6	14	8.7	2.4
38	C_8H_{10}	Ethylbenzene	106	136.1	10	7.1	2.9
39	C_8H_{10}	m/p-Xylene	106	139.1/138.3	8/9	19	1.1
40	C_8H_8	Styrene	104	145.0	6.0	58	0.4
41	C_8H_{10}	o-Xylene	106	144.5	7	13.7	1.5
42	C_9H_{20}	n-Nonane	128	150.8	4	10.2	2.0
43	C_9H_{12}	Isopropylbenzene	120	152.4	5	6.5	3.2
44	C_9H_{12}	n-Propylbenzene	120	159.2	3	6	3.5
45	C_9H_{12}	m-Ethyltoluene	120	161.3	NA	19.2	1.1
46	C_9H_{12}	p-Ethyltoluene	120	162.0	NA	12.1	1.7
47	C_9H_{12}	1,3,5-Trimethylbenzene	120	164.7	3	57.5	0.4
48	C_9H_{12}	o-Ethyltoluene	120	165.2	NA	12.3	1.7
49	C_9H_{12}	1,2,4-Trimethylbenzene	120	169.3	2	32.5	0.6
50	$C_{10}H_{22}$	n-Decane	142	174.1	1	11.6	1.8
51	C_9H_{12}	1,2,3-Trimethylbenzene	120	176.1	NA	32.7	0.6
52	$C_{10}H_{14}$	m-Diethylbenzene	134	181.1	NA	NA	NA
53	$C_{10}H_{14}$	p-Diethylbenzene	134	183.7	NA	NA	NA
54	$C_{11}H_{24}$	n-Undecane	156	195.9	0.41	13.2	1.6

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(e) Estimated on the basic of OH rate constant (Derwent, R.G. 1999)

APPENDIX B

B-1 VOC Concentrations in Ambient at DD Station during the SW Monsoon

B-2 VOC Concentrations in Ambient at JK Station during the SW Monsoon

B-3 VOC Concentrations in Ambient at BS Station during the SW Monsoon

B-4 VOC Concentrations in Ambient at RB Station during the SW Monsoon

B-5 VOC Concentrations in Ambient at DD Station during the NE Monsoon

B-6 VOC Concentrations in Ambient at JK Station during the NE Monsoon

B-7 VOC Concentrations in Ambient at BS Station during the NE Monsoon

B-8 VOC Concentrations in Ambient at RB Station during the NE Monsoon

Table B-1 VOC concentrations in Ambient Air at DD Station during the SW Monsoon, ppbC

No.	RT	VOC Species	DD270703	DD080803	DD250903	DD071003	DD131003	DD191003	Average
1	5.145	1-pentene	8.6	1.6	13.1	19.3	11.6	2.6	9.5
2	5.286	n-pentane	89.4	0.9	99.9	108.7	99.3	14.5	68.8
3	5.629	Trans-2-pentene	15.2	1.5	22.1	27.7	17.2	3.7	14.6
4	5.845	Isoprene	19.3	2.1	26.0	31.7	21.4	6.9	17.9
5	7.683	2-methylpentane	151.8	1.1	15.3	18.0	13.9	2.4	33.7
6	7.771	Cyclopentane	10.1	1.2	84.2	92.8	1.2	13.1	33.8
7	8.351	3-methylpentane	111.3	1.4	68.5	71.3	86.3	11.8	58.4
8	9.159	n-hexane	59.7	2.0	34.3	37.0	50.1	7.1	31.7
9	12.995	Cyclohexane	157.6	1.4	27.8	77.6	43.4	5.8	52.3
10	14.055	Benzene	123.1	23.8	54.4	59.4	71.1	8.9	56.8
11	14.381	2,2,4-trimethylpentane	11.2	3.7	5.4	6.2	7.0	0.7	5.7
12	15.122	n-heptane	48.1	2.8	18.1	17.9	25.6	2.8	19.2
13	21.195	Toluene	755.8	15.6	152.2	160.6	218.5	34.2	222.8
14	21.896	n-octane	58.2	1.0	4.2	5.9	8.8	1.1	13.2
15	28.249	m/p-xylene	843.7	5.9	70.1	75.9	82.8	11.9	181.7
16	28.625	n-nonane	325.6	2.0	9.4	10.6	12.4	2.6	60.4
17	34.692	1,3,5-trimethylbenzene	225.8	135.5	14.7	15.7	17.8	3.1	68.8
18	35.028	n-decane	123.7	0.7	3.4	3.8	6.2	1.9	23.3
19		Total Identified VOC	3,138.4	204.2	723.1	840.1	794.4	135.2	972.6

Table B-2 VOC concentrations in Ambient Air at JK Station during the SW Monsoon, ppbC

No.	RT	VOC Species	JK280703	JK030803	JK090803	JK200903	JK260903	JK021003	JK081003	JK141003	JK201003	Average
1	5.145	1-pentene	1.22	1.22	1.22	1.83	5.80	7.17	2.04	9.87	3.10	3.72
2	5.286	n-pentane	20.65	0.93	14.25	10.32	55.34	55.72	22.16	23.84	10.97	23.80
3	5.629	Trans-2-pentene	3.05	1.52	1.52	1.52	11.30	8.98	5.20	15.82	1.52	5.60
4	5.845	Isoprene	10.11	12.91	15.21	7.98	12.60	24.99	10.76	12.98	11.23	13.20
5	7.683	2-methylpentane	31.46	31.08	17.08	2.26	45.68	51.17	25.48	27.40	1.11	25.86
6	7.771	Cyclopentane	3.04	5.84	7.56	10.83	1.16	1.16	1.16	1.16	7.80	4.41
7	8.351	3-methylpentane	23.34	20.38	12.97	9.17	47.65	47.85	18.16	20.51	6.36	22.93
8	9.159	n-hexane	14.26	24.34	9.74	4.87	29.15	20.70	9.10	11.83	3.72	14.19
9	12.995	Cyclohexane	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	2.85	1.55
10	14.055	Benzene	50.16	57.54	84.13	6.10	54.36	28.77	49.34	13.09	5.55	38.78
11	14.381	2,2,4-trimethylpentane	6.06	5.57	0.65	0.65	4.84	1.79	3.75	1.22	0.65	2.80
12	15.122	n-heptane	17.20	3.42	1.02	2.81	14.80	12.27	4.31	7.20	1.73	7.20
13	21.195	Toluene	153.39	437.52	864.54	32.83	89.14	151.25	72.42	72.56	16.70	210.04
14	21.896	n-octane	4.85	39.00	51.68	0.95	2.12	3.31	8.12	1.84	0.95	12.54
15	28.249	m/p-xylene	52.05	500.36	623.51	8.35	39.44	27.20	31.46	11.43	19.94	145.97
16	28.625	n-nonane	16.94	226.54	276.95	0.90	15.48	5.45	14.02	3.03	2.50	62.42
17	34.692	1,3,5-trimethylbenzene	15.00	487.18	822.90	1.88	8.26	9.30	4.33	3.60	1.54	150.44
18	35.028	n-decane	29.61	548.27	727.65	1.38	3.80	5.20	1.77	2.15	0.86	146.74
19		Total Identified VOC	453.75	2,404.99	3,533.96	106.01	442.28	463.65	284.95	240.91	99.10	892.18

Table B-3 VOC concentrations in Ambient Air at BS Station during the SW Monsoon, ppbC

No.	RT	VOC Species	BS300703	BS050803	BS220903	BS280903	BS041003	BS101003	BS161003	BS221003	Average
1	5.145	1-pentene	1.7	5.9	2.2	3.5	3.8	1.2	2.2	1.8	2.8
2	5.286	n-pentane	13.2	17.5	17.3	11.9	17.8	10.2	11.4	10.0	13.7
3	5.629	Trans-2-pentene	1.5	2.6	1.6	1.5	2.5	1.9	2.0	1.5	1.9
4	5.845	Isoprene	8.8	9.7	7.1	2.1	17.0	4.1	4.7	12.5	8.3
5	7.683	2-methylpentane	47.2	32.5	2.4	10.1	15.2	1.5	1.9	1.8	14.1
6	7.771	Cyclopentane	10.1	6.8	8.0	7.5	2.0	8.9	10.8	7.9	7.8
7	8.351	3-methylpentane	31.9	18.4	11.7	7.5	13.3	6.6	8.6	6.5	13.1
8	9.159	n-hexane	20.1	14.9	8.2	4.6	8.4	4.8	5.7	4.8	8.9
9	12.995	Cyclohexane	1.4	1.4	1.4	1.4	1.4	1.4	4.3	3.5	2.0
10	14.055	Benzene	96.3	72.8	9.2	42.5	21.3	23.7	6.6	7.4	35.0
11	14.381	2,2,4-trimethylpentane	0.7	7.0	0.9	0.7	1.5	2.6	0.7	0.7	1.8
12	15.122	n-heptane	28.8	30.3	4.5	8.2	11.0	1.4	2.2	4.2	11.3
13	21.195	Toluene	678.6	685.6	61.2	26.0	47.0	47.3	33.2	26.1	200.6
14	21.896	n-octane	40.3	51.5	1.7	1.0	1.8	1.0	1.0	1.0	12.4
15	28.249	m/p-xylene	538.1	665.7	12.6	22.5	20.6	16.7	8.6	8.8	161.7
16	28.625	n-nonane	216.1	256.5	1.3	8.4	5.9	4.8	0.8	2.8	62.1
17	34.692	1,3,5-trimethylbenzene	659.6	770.0	5.6	10.0	3.3	1.9	1.7	1.5	181.7
18	35.028	n-decane	514.3	702.0	1.1	2.0	2.2	1.2	1.0	1.4	153.1
19		Total identified VOC	2,908.5	3,351.0	158.0	171.5	195.8	141.2	107.2	104.4	892.2

Table B-4 VOC concentrations in Ambient Air at RB Station during the SW Monsoon, ppbC

No.	RT	VOC Species	RB290703	RB040803	RB270903	RB031003	RB091003	RB151003	RB211003	Average
1	5.145	1-pentene	1.2	1.2	3.5	4.1	1.7	1.2	1.6	2.1
2	5.286	n-pentane	18.1	20.0	22.3	17.2	6.7	7.5	7.2	14.1
3	5.629	Trans-2-pentene	1.5	3.2	1.9	1.5	1.5	1.5	1.5	1.8
4	5.845	Isoprene	5.7	9.9	6.1	14.7	3.4	3.9	6.5	7.2
5	7.683	2-methylpentane	47.3	23.8	18.2	2.8	4.3	1.6	7.5	15.1
6	7.771	Cyclopentane	18.0	9.9	1.2	16.7	1.2	7.9	1.2	8.0
7	8.351	3-methylpentane	33.1	17.7	16.3	14.7	5.1	6.4	4.6	14.0
8	9.159	n-hexane	126.6	10.9	4.6	9.1	3.8	4.3	3.8	23.3
9	12.995	Cyclohexane	155.9	306.6	1.4	1.4	1.4	3.4	2.7	67.5
10	14.055	Benzene	201.2	52.1	35.5	11.5	25.7	4.7	6.2	48.1
11	14.381	2,2,4-trimethylpentane	0.7	0.7	3.2	0.7	2.1	0.7	0.7	1.2
12	15.122	n-heptane	5.5	16.6	10.9	4.5	2.4	1.6	5.1	6.7
13	21.195	Toluene	282.0	393.7	96.8	91.4	44.2	5.6	28.6	134.6
14	21.896	n-octane	12.3	29.0	1.9	1.6	2.6	1.0	1.0	7.0
15	28.249	m/p-xylene	78.6	423.7	36.6	20.8	29.0	8.9	9.3	86.7
16	28.625	n-nonane	24.2	201.5	8.4	5.0	10.9	0.9	3.5	36.3
17	34.692	1,3,5-trimethylbenzene	14.3	676.0	6.1	3.8	3.0	1.5	2.9	101.1
18	35.028	n-decane	19.9	602.6	4.1	3.5	6.5	1.8	2.2	91.5
19		Total Identified VOC	1,046.2	2,799.1	278.7	225.3	155.4	64.4	96.2	666.5

Table B-5 VOC Concentrations in Bangkok Ambient Air at DD Station during the NE Monsoon, ppbC

No.	RT	VOC Species	DD061103	DD121103	DD181103	DD241103	DD301103	DD061203	DD121203	DD040204	DD160204	DD220204	Average
1	5.145	1-pentene	18.6	1.2	2.4	3.5	2.0	1.8	2.9	3.0	3.9	2.6	4.2
2	5.286	n-pentane	85.4	68.7	49.7	42.6	16.8	20.3	31.9	24.5	39.6	19.3	39.9
3	5.629	Trans-2-pentene	10.1	15.5	7.4	6.9	2.7	3.5	5.1	4.9	8.2	3.9	6.8
4	5.845	Isoprene	17.7	22.0	14.7	12.6	7.1	10.2	7.3	8.6	10.7	6.9	11.8
5	7.683	2-methylpentane	13.1	8.9	72.4	11.7	3.7	26.1	11.0	5.7	59.5	4.6	21.7
6	7.771	Cyclopentane	71.4	50.8	1.2	62.8	26.5	1.2	50.3	30.8	89.2	23.5	40.8
7	8.351	3-methylpentane	53.5	40.5	58.8	50.0	21.9	24.6	44.9	24.5	48.2	20.6	38.7
8	9.159	n-hexane	27.3	22.9	30.9	25.2	11.6	11.6	22.0	16.1	35.1	12.7	21.5
9	12.995	Cyclohexane	25.5	17.7	29.7	26.0	11.2	11.8	20.9	17.0	25.0	10.0	19.5
10	14.055	Benzene	33.8	25.0	41.0	35.1	18.7	18.1	28.9	18.6	72.3	11.4	30.3
11	14.381	2,2,4-trimethylpentane	2.2	1.4	1.4	2.1	0.9	0.8	1.6	2.6	1.3	0.9	1.5
12	15.122	n-heptane	15.3	12.7	16.5	16.1	5.4	8.7	9.7	10.0	11.4	4.7	11.0
13	21.195	Toluene	137.5	97.2	158.2	134.2	65.3	75.5	103.5	63.6	132.6	46.6	101.4
14	21.896	n-octane	3.5	3.0	4.4	3.7	1.7	2.0	2.7	2.5	3.5	1.8	2.9
15	28.25	m/p-xylene	46.7	32.0	49.6	44.9	18.9	22.8	27.8	24.8	45.8	15.7	32.9
16	28.63	n-nonane	4.4	4.5	4.3	4.9	1.8	3.8	1.8	4.1	3.6	1.1	3.4
17	34.69	1,3,5-trimethylbenzene	12.3	8.4	13.0	11.9	5.4	5.7	8.4	6.0	11.7	4.4	8.7
18	35.03	n-decane	2.9	2.9	3.8	4.4	2.7	2.3	2.0	4.2	3.2	1.6	3.0
19		Total Identified VOC	581.3	435.1	559.2	498.4	224.5	250.7	382.6	271.4	604.7	192.3	400.0

Table B-6 VOC Concentrations in Bangkok Ambient Air at JK Station during the NE Monsoon, ppbC

No.	RT	VOC Species	JK071103	JK131103	JK191103	JK011203	JK131203	JK050204	JK170204	JK230204	Average
1	5.145	1-pentene	3.4	3.6	3.8	2.3	8.5	2.1	1.3	1.8	3.3
2	5.286	n-pentane	27.5	16.2	26.1	20.5	8.8	29.6	10.1	13.5	19.0
3	5.629	Trans-2-pentene	2.7	2.3	6.1	1.7	30.6	3.1	1.5	2.4	6.3
4	5.845	Isoprene	15.6	6.8	10.4	9.7	6.1	7.3	3.3	6.1	8.2
5	7.683	2-methylpentane	4.9	3.3	40.7	38.0	8.9	7.9	24.7	21.6	18.8
6	7.771	Cyclopentane	27.3	18.7	1.2	1.2	1.2	38.7	1.2	1.2	11.3
7	8.351	3-methylpentane	24.1	15.0	26.6	27.0	6.9	25.9	13.7	15.9	19.4
8	9.159	n-hexane	17.2	8.5	14.9	14.8	3.3	17.2	8.5	7.7	11.5
9	12.995	Cyclohexane	11.3	7.6	16.2	18.3	2.5	14.4	8.6	8.5	10.9
10	14.055	Benzene	17.5	12.5	20.6	20.1	6.3	26.8	12.1	11.6	15.9
11	14.381	2,2,4-trimethylpentane	0.9	0.7	0.7	1.2	0.7	2.7	0.7	0.7	1.0
12	15.122	n-heptane	10.7	3.9	10.1	9.5	1.5	9.4	3.6	4.4	6.6
13	21.195	Toluene	91.5	54.3	111.9	70.0	26.2	112.1	63.3	57.9	73.4
14	21.896	n-octane	1.9	1.1	2.1	1.8	1.0	2.3	1.0	1.4	1.6
15	28.25	m/p-xylene	29.3	9.2	36.8	13.7	6.9	23.5	12.8	14.1	18.3
16	28.63	n-nonane	4.7	2.4	3.1	1.5	0.8	4.3	2.4	2.1	2.6
17	34.69	1,3,5-trimethylbenzene	5.3	2.3	4.9	3.2	1.5	7.4	3.0	3.6	3.9
18	35.03	n-decane	3.6	2.3	4.5	2.3	0.7	4.5	2.2	2.8	2.9
19		Total Identified VOC	299.3	170.5	340.8	256.7	122.3	339.1	173.8	177.3	235.0

Table B-7 VOC Concentrations in Bangkok Ambient Air at BS Station during the NE Monsoon, ppbC

No.	RT	VOC Species	BS091103	BS151103	BS211103	BS271103	BS031203	BS091203	BS151203	BS070204	BS190204	BS250204	Average
1	5.145	1-pentene	4.2	2.6	1.2	1.2	1.2	1.6	2.1	1.9	1.7	1.2	1.9
2	5.286	n-pentane	32.8	17.8	9.2	9.0	16.7	11.4	11.7	10.9	14.0	6.3	14.0
3	5.629	Trans-2-pentene	2.9	1.5	1.5	1.6	2.0	1.5	3.5	2.5	1.7	1.5	2.0
4	5.845	Isoprene	16.2	8.1	15.1	6.5	8.2	3.0	3.0	3.6	3.8	6.7	7.4
5	7.683	2-methylpentane	4.9	1.1	2.7	1.1	24.8	19.1	19.6	15.6	20.0	10.8	12.0
6	7.771	Cyclopentane	27.4	21.2	14.5	16.7	1.2	1.2	1.2	1.2	1.2	1.2	8.7
7	8.351	3-methylpentane	24.0	14.8	10.9	11.4	21.5	14.8	15.0	10.1	13.7	6.1	14.2
8	9.159	n-hexane	13.3	9.3	6.5	7.1	12.2	7.1	7.8	7.1	10.0	4.8	8.5
9	12.995	Cyclohexane	11.7	8.2	1.4	6.1	11.8	1.4	6.9	6.0	10.5	4.6	6.9
10	14.055	Benzene	29.8	13.2	10.0	9.2	16.9	10.2	12.8	19.9	11.9	5.9	14.0
11	14.381	2,2,4-trimethylpentane	3.6	2.0	0.7	0.7	2.1	0.7	1.1	2.2	0.9	0.7	1.4
12	15.122	n-heptane	9.0	5.9	5.1	2.7	8.2	3.0	5.6	5.9	6.3	2.5	5.4
13	21.195	Toluene	82.2	46.0	48.2	41.4	64.4	35.3	38.3	38.3	71.9	37.2	50.3
14	21.896	n-octane	1.9	1.2	1.2	1.1	1.8	1.0	1.0	2.8	1.5	1.0	1.4
15	28.249	m/p-xylene	22.5	12.9	11.7	11.2	16.2	8.1	9.4	18.2	21.2	5.9	13.7
16	28.625	n-nonane	5.6	2.5	2.5	2.4	2.7	0.8	1.8	6.6	2.6	1.3	2.9
17	34.692	1,3,5-trimethylbenzene	4.2	2.8	2.1	2.8	4.0	2.0	2.3	4.3	3.7	1.5	3.0
18	35.028	n-decane	3.1	2.5	2.1	1.9	2.3	1.1	1.3	6.7	3.8	0.9	2.6
19		Total Identified VOC	299.5	173.5	146.6	134.0	218.1	123.1	144.3	163.7	200.2	100.0	170.3

Table B-8 VOC Concentrations in Bangkok Ambient Air at RB Station during the NE Monsoon, ppbC

No.	RT	VOC Species	RB081103	RB141103	RB201103	RB261103	RB021203	RB081203	RB141203	RB060204	RB180204	RB240204	Average
1	5.145	1-pentene	3.2	2.2	1.2	1.2	1.2	2.2	1.2	1.6	1.6	1.4	1.7
2	5.286	n-pentane	28.8	13.4	5.3	6.7	6.7	6.7	4.7	7.3	10.7	5.6	9.6
3	5.629	Trans-2-pentene	1.6	1.5	1.5	1.5	1.5	6.1	11.7	1.5	1.5	1.5	3.0
4	5.845	Isoprene	10.0	5.7	9.9	8.1	7.1	5.1	3.9	7.0	4.2	6.9	6.8
5	7.683	2-methylpentane	5.1	2.3	6.1	9.7	11.0	10.7	5.4	7.2	16.0	8.1	8.2
6	7.771	Cyclopentane	26.6	12.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	4.8
7	8.351	3-methylpentane	22.4	10.0	5.8	8.2	7.4	7.4	3.5	4.5	10.6	4.9	8.5
8	9.159	n-hexane	12.9	5.9	3.6	4.8	4.4	4.4	2.0	4.0	7.4	4.0	5.4
9	12.995	Cyclohexane	12.6	5.0	3.1	4.2	4.1	3.9	1.5	4.4	5.5	3.9	4.8
10	14.055	Benzene	17.2	13.4	5.8	8.8	9.3	6.8	5.2	13.9	10.2	4.6	9.5
11	14.381	2,2,4-trimethylpentane	1.1	1.6	0.7	0.7	0.7	0.7	0.7	1.7	0.7	0.7	0.9
12	15.122	n-heptane	10.2	5.1	2.4	2.3	2.0	1.9	1.0	4.1	3.4	3.9	3.6
13	21.195	Toluene	80.7	51.5	26.6	47.8	42.4	29.5	13.0	37.5	43.1	30.8	40.3
14	21.896	n-octane	1.9	1.0	1.8	1.0	1.0	1.0	1.0	1.5	3.1	1.0	1.4
15	28.249	m/p-xylene	22.8	13.5	10.0	11.2	9.9	7.4	3.5	13.2	13.1	6.7	11.1
16	28.625	n-nonane	3.9	3.0	5.1	1.3	1.5	2.1	1.7	6.4	2.0	2.7	3.0
17	34.692	1,3,5-trimethylbenzene	3.5	1.9	3.2	2.2	2.1	1.5	1.5	3.6	2.3	1.5	2.3
18	35.028	n-decane	3.1	2.0	7.3	2.8	2.6	1.3	1.2	9.5	4.2	2.8	3.7
19		Total Identified VOC	267.7	151.2	100.6	123.7	116.1	99.9	63.7	130.2	140.7	92.1	128.6

APPENDIX C

C-1 Fractions of VOCs from Exhaust Gas of Gasoline Vehicles

C-2 Fractions of VOCs from Vapor of Gasoline

C-3 Fractions of VOCs from Exhaust Gas of Diesel Vehicles

C-4 Fractions of VOCs from Flue Gas of Fuel Oil Boilers

C-5 Fractions of VOCs from Smoke of Biomass Burning

C-6 Fractions of VOCs from Smoke of Food Barbequing

C-7 Fractions of VOCs from Thinners

C-8 Fractions of VOCs from Vapor of Solvent-based Paints

C-9 Fractions of VOCs from Air Samples of Municipal Waste Disposal

Table C-1 Fractions of VOCs from Exhaust Gas of Gasoline Vehicles

VOC Species	2-stroke MC	4-stroke MC	GV w/o cat.	GV w/- cat.	Mean
1-Pentene	0.0026	0.0123	0.0071	0.0052	0.0068
n-Pentane	0.0956	0.0845	0.0491	0.0694	0.0746
trans-2-Pentene	0.0034	0.0378	0.0136	0.0126	0.0169
Isoprene	0.0020	0.0000	0.0000	0.0045	0.0016
2-Methylpentane	0.0867	0.0883	0.0630	0.0947	0.0832
Cyclopentane	0.0000	0.0000	0.0051	0.0078	0.0032
3-Methylpentane	0.0635	0.0650	0.0455	0.0546	0.0572
n-Hexane	0.0635	0.0650	0.0455	0.0546	0.0572
Cyclohexane	0.0691	0.0473	0.0398	0.0503	0.0516
Benzene	0.0701	0.1450	0.1270	0.0949	0.1093
2,2,4-Trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0420	0.0216	0.0234	0.0250	0.0280
Toluene	0.2952	0.2614	0.3345	0.3499	0.3103
n-Octane	0.0186	0.0129	0.0072	0.0087	0.0119
m/p-Xylene	0.1736	0.1637	0.2400	0.1593	0.1841
n-Nonane	0.0046	0.0089	0.0023	0.0050	0.0052
1,3,5-Trimethylbenzene	0.0083	0.0347	0.0315	0.0327	0.0268
n-Decane	0.0005	0.0045	0.0018	0.0066	0.0033
Total identified VOCs	1	1	1	1	1

Source: Wongpun, et al., 2003

Table C-2 Fractions of VOCs from Vapor of Gasoline

VOC Species	Brand 1	Brand 2	Brand 3	Brand 4	Brand 5	Mean
1-Pentene	0.0000	0.0435	0.0192	0.0000	0.0000	0.0125
n-Pentane	0.1091	0.2826	0.2500	0.0000	0.3044	0.1892
trans-2-Pentene	0.0182	0.0435	0.0385	0.0000	0.0000	0.0200
Isoprene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Methylpentane	0.2364	0.2391	0.2500	0.1311	0.2810	0.2275
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Methylpentane	0.1455	0.1304	0.1346	0.0984	0.1405	0.1299
n-Hexane	0.1636	0.1304	0.1346	0.1148	0.0937	0.1274
Cyclohexane	0.0182	0.0000	0.0192	0.0328	0.0468	0.0234
Benzene	0.0727	0.0435	0.0385	0.0984	0.0187	0.0544
2,2,4-Trimethylpentane	0.0000	0.0000	0.0192	0.0000	0.0000	0.0038
n-Heptane	0.0364	0.0000	0.0192	0.0820	0.0117	0.0299
Toluene	0.1818	0.0870	0.0769	0.4262	0.0937	0.1731
n-Octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m/p-Xylene	0.0182	0.0000	0.0000	0.0164	0.0094	0.0088
n-Nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1,3,5-Trimethylbenzen	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total identified VOCs	1	1	1	1	1	1

Table C-3 Fractions of VOCs from Diesel Vehicles

VOC Species	LDDV 1	LDDV 2	EURO I Bus	EURO II Bus	Mean
1-Pentene	0.0967	0.0466	0.1274	0.0711	0.0855
n-Pentane	0.0197	0.0394	0.0362	0.0438	0.0348
trans-2-Pentene	0.0123	0.0158	0.0171	0.0167	0.0155
Isoprene	0.0000	0.0011	0.0000	0.0000	0.0003
2-Methylpentane	0.0905	0.0910	0.0651	0.1515	0.0995
Cyclopentane	0.0013	0.0065	0.0000	0.0030	0.0027
3-Methylpentane	0.0291	0.0317	0.0171	0.0609	0.0347
n-Hexane	0.0291	0.0317	0.0171	0.0609	0.0347
Cyclohexane	0.0394	0.0277	0.0241	0.0628	0.0385
Benzene	0.3380	0.2538	0.2493	0.2297	0.2677
2,2,4-Trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000
n-Heptane	0.0218	0.0113	0.0150	0.0220	0.0175
Toluene	0.1902	0.1459	0.2683	0.1712	0.1939
n-Octane	0.0103	0.0166	0.0166	0.0159	0.0148
m/p-Xylene	0.0582	0.0644	0.0680	0.0611	0.0629
n-Nonane	0.0100	0.0518	0.0190	0.0171	0.0245
1,3,5-Trimethylbenzene	0.0264	0.0463	0.0000	0.0282	0.0252
n-Decane	0.0434	0.1324	0.0636	0.0000	0.0598
Total identified VOCs	1	1	1	1	1

Source: Wongpun, et al., 2003

Table C-4 Fractions of VOCs from Flue Gas of Fuel Oil Boilers

VOC Species	Boiler 1	Boiler 2	Boiler 3	Boiler 4	Boiler 5	Boiler 6	Boiler 7	Mean
1-Pentene	0.0000	0.0088	0.0010	0.0000	0.0000	0.0000	0.0000	0.0014
n-Pentane	0.0051	0.0000	0.0028	0.0010	0.0206	0.0134	0.0120	0.0079
trans-2-Pentene	0.0057	0.0227	0.0013	0.0004	0.0000	0.0000	0.0000	0.0043
Isoprene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Methylpentane	0.0338	0.0000	0.0468	0.0325	0.0561	0.0193	0.1402	0.0470
Cyclopentane	0.0000	0.0000	0.0017	0.0005	0.0000	0.0000	0.0000	0.0003
3-Methylpentane	0.0755	0.0659	0.0985	0.0691	0.0661	0.0240	0.0783	0.0682
n-Hexane	0.0187	0.0213	0.1496	0.1118	0.0463	0.0138	0.0700	0.0616
Cyclohexane	0.0196	0.0217	0.0649	0.0647	0.0219	0.0068	0.0190	0.0312
Benzene	0.0515	0.0461	0.0061	0.0035	0.1228	0.0444	0.0505	0.0464
2,2,4-Trimethylpentane	0.0284	0.0255	0.0014	0.0007	0.0000	0.0043	0.0000	0.0086
n-Heptane	0.0747	0.0574	0.0053	0.0030	0.0543	0.0126	0.0325	0.0342
Toluene	0.1667	0.1657	0.5123	0.6002	0.2939	0.3823	0.2969	0.3454
n-Octane	0.0410	0.0493	0.0038	0.0020	0.0596	0.0129	0.0258	0.0278
m/p-Xylene	0.3940	0.3603	0.0734	0.0828	0.1520	0.3549	0.1232	0.2201
n-Nonane	0.0578	0.0460	0.0032	0.0022	0.0365	0.0091	0.0357	0.0272
1,3,5-Trimethylbenzene	0.0275	0.1094	0.0150	0.0156	0.0000	0.0857	0.0503	0.0433
n-Decane	0.0000	0.0000	0.0130	0.0101	0.0697	0.0165	0.0656	0.0250
Total identified VOCs	1	1	1	1	1	1	1	1

Source: Wongpun, et al., 2003

Table C-5 Fractions of VOCs from Smoke of Biomass Burning

VOC Species	Flaming smoke	Smouldering smoke	Mean
1-Pentene	0.0165	0.0161	0.0163
n-Pentane	0.0429	0.0000	0.0214
trans-2-Pentene	0.0115	0.0118	0.0117
Isoprene	0.0463	0.0512	0.0487
2-Methylpentane	0.0506	0.0409	0.0457
Cyclopentane	0.0016	0.0000	0.0008
3-Methylpentane	0.0094	0.0095	0.0095
n-Hexane	0.0122	0.0191	0.0157
Cyclohexane	0.0083	0.0153	0.0118
Benzene	0.4384	0.3514	0.3949
2,2,4-Trimethylpentane	0.0000	0.0000	0.0000
n-Heptane	0.0101	0.0242	0.0172
Toluene	0.2741	0.3474	0.3108
n-Octane	0.0035	0.0052	0.0044
m/p-Xylene	0.0516	0.0650	0.0583
n-Nonane	0.0042	0.0056	0.0049
1,3,5-Trimethylbenzene	0.0126	0.0279	0.0202
n-Decane	0.0059	0.0094	0.0076
Total identified VOCs	1	1	1

Source: Wongpun, et al., 2003

Table C-6 Fractions of VOCs from Smoke from Food Barbequing

VOC Species	sample 1	sample 2	sample 3	Mean
1-pentene	0.0726	0.0978	0.1087	0.0930
n-pentane	0.0929	0.1235	0.0919	0.1028
Trans-2-pentene	0.0150	0.0187	0.0156	0.0164
Isoprene	0.0149	0.0150	0.0153	0.0151
2-methylpentane	0.0061	0.0096	0.0109	0.0089
Cyclopentane	0.0722	0.1763	0.0000	0.0828
3-methylpentane	0.0056	0.0074	0.0073	0.0068
n-hexane	0.0739	0.0977	0.0828	0.0848
Cyclohexane	0.0408	0.0198	0.0471	0.0359
Benzene	0.2132	0.1271	0.2299	0.1901
2,2,4-trimethylpentane	0.0302	0.0255	0.0337	0.0298
n-heptane	0.1002	0.1023	0.0928	0.0985
Toluene	0.1161	0.0893	0.1046	0.1033
n-octane	0.0979	0.1001	0.0821	0.0934
m/p-xylene	0.0000	0.0000	0.0000	0.0000
n-nonane	0.0674	0.0888	0.0710	0.0757
1,3,5-trimethylbenzene	0.0000	0.0000	0.0000	0.0000
n-decane	0.0500	0.0736	0.0063	0.0433
Total Identified VOCs	1	1	1	1

Table C-7 Fractions of VOCs from Thinners

VOC Species	brand 1	brand 2	brand 3	brand 4	brand 5	Mean
1-pentene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Trans-2-pentene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Isoprene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-methylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-methylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,2,4-trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.9357	0.9196	1.0000	1.0000	0.9791	0.9669
n-octane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
m/p-xylene	0.0234	0.0804	0.0000	0.0000	0.0112	0.0230
n-nonane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1,3,5-trimethylbenzene	0.0409	0.0000	0.0000	0.0000	0.0096	0.0101
n-decane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total identified VOCs	1	1	1	1	1	1

Table C-8 Fractions of VOCs from Vapor of Paints

VOC Species	Brand 1	Brand 2	Brand 3	Brand 4	Brand 5	Mean
1-pentene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-pentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Trans-2-pentene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Isoprene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-methylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclopentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-methylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-hexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Benzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,2,4-trimethylpentane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-heptane	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Toluene	0.1042	0.0417	0.0000	0.1111	0.0606	0.0635
n-octane	0.2917	0.1250	0.3158	0.2222	0.2727	0.2455
m/p-xylene	0.1667	0.5000	0.2632	0.3704	0.1818	0.2964
n-nonane	0.2708	0.1875	0.2368	0.1852	0.2727	0.2306
1,3,5-trimethylbenzene	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-decane	0.1667	0.1458	0.1842	0.1111	0.2121	0.1640
Total identified VOCs	1	1	1	1	1	1

Table C-9 Fractions of VOCs from Air Samples of Municipal Waste Disposal

VOC Species	Sample1	Sample 2	Sample 3	Mean
1-pentene	0.0000	0.0000	0.0000	0.0000
n-pentane	0.0422	0.0061	0.0069	0.0184
Trans-2-pentene	0.0000	0.0000	0.0000	0.0000
Isoprene	0.0058	0.0000	0.0000	0.0019
2-methylpentane	0.0095	0.0000	0.0000	0.0032
Cyclopentane	0.0000	0.0000	0.0000	0.0000
3-methylpentane	0.0147	0.0000	0.0000	0.0049
n-hexane	0.0236	0.0023	0.0187	0.0149
Cyclohexane	0.0298	0.0976	0.0000	0.0425
Benzene	0.0000	0.0000	0.0000	0.0000
2,2,4-trimethylpentane	0.0000	0.0777	0.0000	0.0259
n-heptane	0.0475	0.0123	0.0397	0.0332
Toluene	0.7180	0.7161	0.7858	0.7400
n-octane	0.0256	0.0135	0.0376	0.0256
m/p-xylene	0.0672	0.0465	0.0795	0.0644
n-nonane	0.0160	0.0095	0.0184	0.0146
1,3,5-trimethylbenzene	0.0000	0.0092	0.0000	0.0031
n-decane	0.0000	0.0091	0.0134	0.0075
Total Identified VOCs	1	1	1	1

APPENDIX D

Example of CMB Modeling

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Example of CMB Modeling

This process is trial and error until all parameters showed the goodness of fit

Step 1 Put all sources and all fitting species in the model.
Step 2 Get out sources which have minus TSTAT
Step 3 Get out sources which TSTAT value is less than 2
Step 4 Pull out or/and put in some fitting species which have high R/U
Step 5 Repeat again and again until R-square around 0.8-0.9, chi-square not more than 4, and Percent mass between 80-120%

SOURCE CONTRIBUTION ESTIMATES - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .86 PERCENT MASS 98.6
CHI SQUARE 4.33 DF 8

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
1	GV	65861.7000	12873.2500	5.1162
2	DV	23709.8100	8361.1260	2.8357
3	VG	-22292.4500	5875.8450	-3.7939
4	FB	35649.8000	13556.5800	2.6297
5	VP	13084.1300	3120.8600	4.1925
6	LT	-18354.5100	9276.8650	-1.9785
7	BB	-13458.3600	8728.1440	-1.5419
8	BBQ	-21686.9400	6190.1050	-3.5035
9	MW	14817.4100	8421.0670	1.7596

MEASURED CONCENTRATION FOR SIZE: VOC
78458.8+- 7845.9

UNCERTAINTY/SIMILARITY CLUSTERS							CMB7 33889	SUM OF CLUSTER SOURCES
1	4	9						116328.900+- 12506.880
1	2	3	6	7	8	9		28596.660+- 13854.190
2	4	7						45901.260+- 15522.550
1	4	6	7					69698.630+- 14760.330
2	3	6	7	8				-52082.450+- 14126.720
2	3	4	8					15380.220+- 16263.070
2	3	9						16234.770+- 14919.310
3	5							-9208.323+- 7279.462
2	3	5	8					-7185.452+- 8748.374

SPECIES CONCENTRATIONS - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .86 PERCENT MASS 98.6
CHI SQUARE 4.33 DF 8

SPECIES	TOT	I T	MEAS	CALC	RATIO C/M	RATIO R/U
VT		T	*********+-*********	*********+-*********	.99+- .15	-.1
V1	43224	*	216.10000+- 21.61000	-70.19609+-594.36740	-.32+- 2.75	-.5
V2	43220	*	*********+-223.57000	12.92545+-*********	.01+- .61	-1.6
V3	43226	*	379.65000+- 37.97000	568.61540+-272.37710	1.50+- .73	.7
V4	43243		483.65000+- 48.37000	*********+-178.11090	-2.29+- .43	-8.6
V5	43285	*	*********+-379.62000	*********+-*********	.97+- .43	-.1
V6	43242	*	252.50000+- 25.25000	226.99090+- 42.53922	.90+- .19	-.5
V7	43230	*	*********+-278.24000	*********+-*********	1.40+- .41	1.0
V8	43231	*	*********+-149.22000	*********+-*********	1.35+- .76	.5
V9	43248	*	*********+-394.01000	*********+-776.82180	1.13+- .23	.6
V10	45201	*	*********+-307.63000	*********+-*********	1.20+- .80	.2
V11	43250	*	279.52000+- 27.95000	247.81340+-122.90430	.89+- .45	-.3
V12	43232	*	*********+-120.16000	*********+-608.58770	1.01+- .52	.0
V13	45202	*	*********+-*********	*********+-*********	1.08+- .36	.2

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V14	43233	* *********+-145.49000	*********+-911.78360	1.88+- .65	1.4
V15	45109	* *********+-*********	*********+-*********	1.18+- .19	1.0
V16	43235	* *********+-814.10000	*********+-686.74970	.48+- .10	-4.0
V17	45207	* *********+-564.61000	*********+-490.99300	.62+- .11	-2.9
V18	43238	* *********+-309.35000	*********+-560.04550	1.32+- .22	1.6

SOURCE CONTRIBUTION ESTIMATES - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .77 PERCENT MASS 84.6
CHI SQUARE 11.67 DF 12

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
1	GV	30345.7100	4473.8600	6.7829
2	DV	-245.8865	663.0551	-.3708
4	FB	19927.0400	6620.3800	3.0100
5	VP	12714.5500	1942.9430	6.5440
9	MW	3598.6400	2753.1870	1.3071

MEASURED CONCENTRATION FOR SIZE: VOC
78458.8+- 7845.9

UNCERTAINTY/SIMILARITY CLUSTERS			CMB7 33889	SUM OF CLUSTER SOURCES
1	4	9		53871.400+- 3089.605
1	4	9		53871.400+- 3089.605
5	9			16313.190+- 3705.255
4	9			23525.680+- 4746.426

SPECIES CONCENTRATIONS - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .77 PERCENT MASS 84.6
CHI SQUARE 11.67 DF 12

SPECIES VT	TOT	I T	MEAS	CALC	RATIO C/M	RATIO R/U
V1	43224	*	216.10000+- 21.61000	213.22540+- 43.12834	.85+- .09	-1.4
V2	43220	*	*********+-223.57000	*********+-453.47450	.99+- .22	-.1
V3	43226	*	379.65000+- 37.97000	594.71760+-104.73370	1.11+- .23	.5
V4	43243		483.65000+- 48.37000	55.31679+- 9.51513	1.57+- .32	1.9
V5	43285	*	*********+-379.62000	*********+-537.46600	.11+- .02	-8.7
V6	43242	*	252.50000+- 25.25000	102.42050+- 18.36417	.91+- .17	-.5
V7	43230	*	*********+-278.24000	*********+-439.47460	.41+- .08	-4.8
V8	43231	*	*********+-149.22000	*********+-424.11280	1.12+- .19	.6
V9	43248	*	*********+-394.01000	*********+-337.48960	2.02+- .35	3.4
V10	45201	*	*********+-307.63000	*********+-690.05340	.59+- .10	-3.1
V11	43250	*	279.52000+- 27.95000	264.57740+- 38.84046	1.36+- .26	1.5
V12	43232	*	*********+-120.16000	*********+-218.64590	.95+- .17	-.3
V13	45202	*	*********+-*********	*********+-*********	1.37+- .23	1.8
V14	43233	*	*********+-145.49000	*********+-638.61200	1.04+- .16	.3
V15	45109	*	*********+-*********	*********+-*********	2.84+- .52	4.1
V16	43235	*	*********+-814.10000	*********+-596.80090	.66+- .10	-2.7
V17	45207	*	*********+-564.61000	*********+-238.57000	.45+- .09	-4.4
V18	43238	*	*********+-309.35000	*********+-429.34410	.30+- .05	-6.5
					.87+- .16	-.8

SOURCE CONTRIBUTION ESTIMATES - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .97 PERCENT MASS 86.3
CHI SQUARE 2.09 DF 6

SOURCE
* TYPE SCE(UG/M3) STD ERR TSTAT

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1	GV	22793.6000	4315.4130	5.2819
2	DV	274.7708	559.5290	.4911
4	FB	21951.3300	7496.4010	2.9282
5	VP	19404.4800	4173.3560	4.6496
9	MW	3287.3840	3043.1840	1.0802

MEASURED CONCENTRATION FOR SIZE: VOC
78458.8+- 7845.9

UNCERTAINTY/SIMILARITY CLUSTERS			CMB7 33889	SUM OF CLUSTER SOURCES
1	4	9		48032.310+- 3383.717
1	4	9		48032.310+- 3383.717
4	9			25238.710+- 5271.012

SPECIES CONCENTRATIONS - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .97 PERCENT MASS 86.3
CHI SQUARE 2.09 DF 6

SPECIES		I	MEAS	CALC	RATIO C/M		RATIO R/U
VT	TOT	T	*********+-*********	*********+-*********	.86+-	.10	-1.2
V1	43224	*	216.10000+- 21.61000	209.22120+- 32.97926	.97+-	.18	-.2
V2	43220	*	*********+-223.57000	*********+-341.66330	.87+-	.18	-.7
V3	43226	*	379.65000+- 37.97000	483.86140+- 80.00551	1.27+-	.25	1.2
V4	43243		483.65000+- 48.37000	42.79821+- 7.55468	.09+-	.02	-9.0
V5	43285	*	*********+-379.62000	*********+-431.02370	.78+-	.14	-1.4
V6	43242		252.50000+- 25.25000	80.26679+- 13.99100	.32+-	.06	-6.0
V7	43230	*	*********+-278.24000	*********+-395.80760	1.02+-	.17	.1
V8	43231		*********+-149.22000	*********+-374.86770	1.82+-	.31	3.0
V9	43248		*********+-394.01000	*********+-272.81980	.51+-	.09	-4.0
V10	45201	*	*********+-307.63000	*********+-539.51510	1.16+-	.21	.8
V11	43250	*	279.52000+- 27.95000	273.92470+- 41.15529	.98+-	.18	-.1
V12	43232	*	*********+-120.16000	*********+-197.61000	1.25+-	.21	1.3
V13	45202	*	*********+-*********	*********+-*********	.97+-	.15	-.2
V14	43233		*********+-145.49000	*********+-962.36000	3.94+-	.77	4.4
V15	45109	*	*********+-*********	*********+-*********	.71+-	.11	-2.2
V16	43235		*********+-814.10000	*********+-902.70530	.64+-	.13	-2.4
V17	45207		*********+-564.61000	*********+-227.22590	.28+-	.05	-6.7
V18	43238	*	*********+-309.35000	*********+-646.08540	1.24+-	.24	1.1

SOURCE CONTRIBUTION ESTIMATES - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .96 PERCENT MASS 86.4
CHI SQUARE 1.68 DF 8

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
1	GV	21795.0000	3042.3630	7.1638
4	FB	28090.2500	4459.2270	6.2994
5	VP	17884.1600	3905.5570	4.5792

MEASURED CONCENTRATION FOR SIZE: VOC
78458.8+- 7845.9

UNCERTAINTY/SIMILARITY CLUSTERS	CMB7 33889	SUM OF CLUSTER SOURCES

SPECIES CONCENTRATIONS - SITE: D2707S DATE: 27/07/03 CMB7 33889

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SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .96 PERCENT MASS 86.4
CHI SQUARE 1.68 DF 8

SPECIES	TOT	I	MEAS	CALC	RATIO C/M	RATIO R/U
VT		T	*********+-*********	*********+-*********	.86+- .10	-1.2
V1	43224	*	216.10000+- 21.61000	187.53240+- 31.70580	.87+- .17	-.7
V2	43220	*	*********+-223.57000	*********+-327.84580	.83+- .17	-1.0
V3	43226	*	379.65000+- 37.97000	489.12360+- 78.31727	1.29+- .24	1.3
V4	43243		483.65000+- 48.37000	34.87201+- 7.33765	.07+- .02	-9.2
V5	43285	*	*********+-379.62000	*********+-447.90830	.83+- .14	-1.1
V6	43242		252.50000+- 25.25000	78.17109+- 13.49433	.31+- .06	-6.1
V7	43230	*	*********+-278.24000	*********+-455.72140	1.14+- .20	.7
V8	43231		*********+-149.22000	*********+-425.57520	2.00+- .35	3.3
V9	43248		*********+-394.01000	*********+-284.13000	.51+- .09	-4.0
V10	45201	*	*********+-307.63000	*********+-544.12730	1.20+- .21	1.0
V11	43250	*	279.52000+- 27.95000	241.57610+- 47.83657	.86+- .19	-.7
V12	43232	*	*********+-120.16000	*********+-226.68510	1.31+- .23	1.4
V13	45202	*	*********+-*********	*********+-*********	.93+- .16	-.4
V14	43233		*********+-145.49000	*********+-893.62290	3.73+- .72	4.4
V15	45109	*	*********+-*********	*********+-*********	.73+- .11	-2.0
V16	43235		*********+-814.10000	*********+-838.58080	.61+- .12	-2.7
V17	45207		*********+-564.61000	*********+-271.25440	.32+- .06	-6.1
V18	43238	*	*********+-309.35000	*********+-603.37320	1.20+- .23	.9

SOURCE CONTRIBUTION ESTIMATES - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .97 PERCENT MASS 80.3
CHI SQUARE 1.25 DF 7

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
1	GV	21706.2500	3004.6640	7.2242
4	FB	26738.6300	4374.0050	6.1131
5	VP	14537.4300	3622.3590	4.0132

MEASURED CONCENTRATION FOR SIZE: VOC
78458.8+- 7845.9

UNCERTAINTY/SIMILARITY CLUSTERS CMB7 33889 SUM OF CLUSTER SOURCES

SPECIES CONCENTRATIONS - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .97 PERCENT MASS 80.3
CHI SQUARE 1.25 DF 7

SPECIES	TOT	I	MEAS	CALC	RATIO C/M	RATIO R/U
VT		T	*********+-*********	*********+-*********	.80+- .10	-1.7
V1	43224	*	216.10000+- 21.61000	185.03660+- 31.46324	.86+- .17	-.8
V2	43220	*	*********+-223.57000	*********+-326.24370	.82+- .17	-1.0
V3	43226	*	379.65000+- 37.97000	481.81170+- 77.63924	1.27+- .24	1.2
V4	43243		483.65000+- 48.37000	34.73000+- 7.18801	.07+- .02	-9.2
V5	43285	*	*********+-379.62000	*********+-439.32750	.81+- .14	-1.3
V6	43242		252.50000+- 25.25000	77.48160+- 13.37464	.31+- .06	-6.1
V7	43230	*	*********+-278.24000	*********+-439.85470	1.10+- .19	.5
V8	43231		*********+-149.22000	*********+-411.58190	1.94+- .34	3.2
V9	43248		*********+-394.01000	*********+-278.33520	.50+- .09	-4.1
V10	45201	*	*********+-307.63000	*********+-536.48130	1.17+- .21	.9
V11	43250	*	279.52000+- 27.95000	229.95220+- 45.53068	.82+- .18	-.9
V12	43232	*	*********+-120.16000	*********+-218.71720	1.27+- .22	1.3
V13	45202	*	*********+-*********	*********+-*********	.89+- .15	-.7
V14	43233		*********+-145.49000	*********+-731.18250	3.14+- .59	4.2

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V15	45109	*********+-*********	*********+-*********	.67+-	.10	-2.6
V16	43235	*********+-814.10000	*********+-685.89680	.51+-	.10	-3.7
V17	45207	*********+-564.61000	*********+-260.49200	.31+-	.06	-6.3
V18	43238	* *********+-309.35000	*********+-495.44860	1.01+-	.19	.1

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SOURCE CONTRIBUTION ESTIMATES - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .96 PERCENT MASS 86.4
CHI SQUARE 1.68 DF 8

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
1	GV	21795.0000	3042.3630	7.1638
4	FB	28090.2500	4459.2270	6.2994
5	VP	17884.1600	3905.5570	4.5792

MEASURED CONCENTRATION FOR SIZE: VOC
78458.8+- 7845.9

UNCERTAINTY/SIMILARITY CLUSTERS CMB7 33889 SUM OF CLUSTER SOURCES

SPECIES CONCENTRATIONS - SITE: D2707S DATE: 27/07/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .96 PERCENT MASS 86.4
CHI SQUARE 1.68 DF 8

SPECIES	TOT	I	MEAS	CALC	RATIO C/M		RATIO R/U
VT	TOT	T	*********+-*********	*********+-*********	.86+-	.10	-1.2
V1	43224	*	216.10000+- 21.61000	187.53240+- 31.70580	.87+-	.17	-.7
V2	43220	*	*********+-223.57000	*********+-327.84580	.83+-	.17	-1.0
V3	43226	*	379.65000+- 37.97000	489.12360+- 78.31727	1.29+-	.24	1.3
V4	43243		483.65000+- 48.37000	34.87201+- 7.33765	.07+-	.02	-9.2
V5	43285	*	*********+-379.62000	*********+-447.90830	.83+-	.14	-1.1
V6	43242		252.50000+- 25.25000	78.17109+- 13.49433	.31+-	.06	-6.1
V7	43230	*	*********+-278.24000	*********+-455.72140	1.14+-	.20	.7
V8	43231		*********+-149.22000	*********+-425.57520	2.00+-	.35	3.3
V9	43248		*********+-394.01000	*********+-284.13000	.51+-	.09	-4.0
V10	45201	*	*********+-307.63000	*********+-544.12730	1.20+-	.21	1.0
V11	43250	*	279.52000+- 27.95000	241.57610+- 47.83657	.86+-	.19	-.7
V12	43232	*	*********+-120.16000	*********+-226.68510	1.31+-	.23	1.4
V13	45202	*	*********+-*********	*********+-*********	.93+-	.16	-.4
V14	43233		*********+-145.49000	*********+-893.62290	3.73+-	.72	4.4
V15	45109	*	*********+-*********	*********+-*********	.73+-	.11	-2.0
V16	43235		*********+-814.10000	*********+-838.58080	.61+-	.12	-2.7
V17	45207		*********+-564.61000	*********+-271.25440	.32+-	.06	-6.1
V18	43238	*	*********+-309.35000	*********+-603.37320	1.20+-	.23	.9

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SOURCE CONTRIBUTION ESTIMATES - SITE: D0808S DATE: 08/08/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .51 PERCENT MASS 37.0
CHI SQUARE 32.18 DF 8

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
1	GV	-295.0639	289.5549	-1.0190
2	DV	-53.2854	147.8760	-.3603
3	VG	-116.1592	87.5246	-1.3272
4	FB	481.3508	176.0502	2.7342
5	VP	3.1095	37.2316	.0835
6	LT	-863.5200	320.8499	-2.6914

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7	BB	1668.1630	373.3696	4.4679
8	BBQ	233.7204	103.8370	2.2508
9	MW	829.2335	277.3051	2.9903

MEASURED CONCENTRATION FOR SIZE: VOC
5105.1+- 510.5

UNCERTAINTY/SIMILARITY CLUSTERS				CMB7 33889	SUM OF CLUSTER SOURCES
1	6	7	9		1338.812+- 356.973
2	6	7	9		1580.591+- 403.959
1	4	6			-677.233+- 456.451
4	6	7	9		2115.227+- 463.476
2	8	9			1009.669+- 288.331
1	3	4	9		899.361+- 206.180
2	3	8			64.276+- 135.765
1	3	5			-408.114+- 247.091
2	3	5	8		67.385+- 135.047

SPECIES CONCENTRATIONS - SITE: D0808S DATE: 08/08/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .51 PERCENT MASS 37.0
CHI SQUARE 32.18 DF 8

SPECIES	TOT	T	MEAS	CALC	RATIO C/M	RATIO R/U
VT	43224	*	*********+-510.51000	*********+-286.47350	.37+- .07	-5.5
V1	43224	*	41.01000+- 4.10000	42.45138+- 7.19528	1.04+- .20	.2
V2	43220	*	23.23000+- 2.32000	28.03415+- 10.71946	1.21+- .48	.4
V3	43226	*	37.88000+- 3.79000	18.42987+- 4.14518	.49+- .12	-3.5
V4	43243		53.12000+- 5.31000	88.70756+- 16.23609	1.67+- .35	2.1
V5	43285	*	27.74000+- 2.77000	47.19789+- 17.44637	1.70+- .65	1.1
V6	43242	*	28.95000+- 2.90000	.90505+- .41096	.03+- .01	-9.6
V7	43230	*	35.02000+- 3.50000	20.81631+- 8.62014	.59+- .25	-1.5
V8	43231	*	50.09000+- 5.01000	55.51946+- 10.27245	1.11+- .23	.5
V9	43248	*	34.58000+- 3.46000	59.76623+- 9.39048	1.73+- .32	2.5
V10	45201	*	596.18000+- 59.62000	682.06050+-132.49290	1.14+- .25	.6
V11	43250	*	93.66000+- 9.37000	29.03175+- 4.46125	.31+- .06	-6.2
V12	43232	*	68.79000+- 6.88000	80.09428+- 9.60491	1.16+- .18	1.0
V13	45202	*	389.27000+- 38.93000	373.12430+-234.99100	.96+- .61	-.1
V14	43233	*	23.86000+- 23.86000	69.91884+- 8.23317	2.93+- 2.95	1.8
V15	45109	*	147.05000+- 14.71000	178.96740+- 32.83505	1.22+- .25	.9
V16	43235	*	49.99000+- 5.00000	43.45097+- 4.62749	.87+- .13	-1.0
V17	45207	*	*********+-338.66000	39.13794+- 8.24028	.01+- .00	-9.9
V18	43238	*	18.08000+- 18.08000	33.63803+- 3.95768	1.86+- 1.87	.8

SOURCE CONTRIBUTION ESTIMATES - SITE: D0808S DATE: 08/08/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .57 PERCENT MASS 28.5
CHI SQUARE 25.70 DF 13

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
4	FB	341.0502	70.2183	4.8570
7	BB	592.3484	128.2277	4.6195
8	BBQ	366.0294	49.4812	7.3973
9	MW	153.2896	86.1154	1.7800

MEASURED CONCENTRATION FOR SIZE: VOC
5105.1+- 510.5

UNCERTAINTY/SIMILARITY CLUSTERS				CMB7 33889	SUM OF CLUSTER SOURCES

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       4      9                                                    494.340+-    92.296
       4      8      9                                             860.369+-    93.463
       4      7      8      9                                     1452.718+-    90.891
-------------------------------------------------------------------------------

SPECIES CONCENTRATIONS -  SITE: D0808S       DATE: 08/08/03    CMB7 33889
SAMPLE DURATION         4        START HOUR         8          SIZE:    VOC
       R SQUARE        .57     PERCENT MASS       28.5
     CHI SQUARE     25.70               DF         13

SPECIES-------I---MEAS-----------------CALC-------------RATIO C/M----RATIO R/U
VT     TOT    T *********+-510.51000 *********+- 90.89090    .28+-   .03    -7.0
V1     43224  *  41.01000+-  4.10000  45.52779+-  7.33055   1.11+-   .21      .5
V2     43220  *  23.23000+-  2.32000  48.13229+-  6.56824   2.07+-   .35     3.6
V3     43226  *  37.88000+-  3.79000  16.19342+-  2.10424    .43+-   .07    -5.0
V4     43243     53.12000+-  5.31000  39.13123+-  6.08866    .74+-   .14    -1.7
V5     43285  *  27.74000+-  2.77000  46.66486+-  6.30312   1.68+-   .28     2.7
V6     43242  *  28.95000+-  2.90000   1.38146+-   .19201    .05+-   .01    -9.5
V7     43230  *  35.02000+-  3.50000  32.60289+-  4.81111    .93+-   .17     -.4
V8     43231  *  50.09000+-  5.01000  65.24239+-  7.97685   1.30+-   .21     1.6
V9     43248  *  34.58000+-  3.46000  39.51852+-  4.20040   1.14+-   .17      .9
V10    45201  * 596.18000+- 59.62000 334.00310+- 49.83350    .56+-   .10    -3.4
V11    43250  *  93.66000+-  9.37000  12.94272+-  1.56015    .14+-   .02    -8.5
V12    43232  *  68.79000+-  6.88000  58.38345+-  7.07771    .85+-   .13    -1.1
V13    45202  * 389.27000+- 38.93000 464.67570+- 50.25169   1.19+-   .18     1.2
V14    43233  *  23.86000+- 23.86000  65.35251+- 10.11003   2.74+- 2.77     1.6
V15    45109  * 147.05000+- 14.71000 119.47090+- 16.64720    .81+-   .14    -1.2
V16    43235  *  49.99000+-  5.00000  33.52383+-  4.29316    .67+-   .11    -2.5
V17    45207  * *********+-338.66000  27.20811+-  3.79838    .01+-   .00    -9.9
V18    43238  *  18.08000+- 18.08000  24.13377+-  2.76713   1.33+- 1.34      .3
-------------------------------------------------------------------------------

SOURCE CONTRIBUTION ESTIMATES -  SITE: D0808S       DATE: 08/08/03    CMB7 33889
SAMPLE DURATION         4        START HOUR         8          SIZE:    VOC
       R SQUARE        .91     PERCENT MASS       27.1
     CHI SQUARE      3.71               DF          9

  SOURCE
     * TYPE      SCE(UG/M3)     STD ERR       TSTAT
-----------------------------------------------
4      FB          356.2522     72.3975      4.9208
7      BB          635.0453    134.2082      4.7318
8      BBQ         394.0573     56.6917      6.9509
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MEASURED CONCENTRATION FOR SIZE: VOC
    5105.1+-   510.5

       UNCERTAINTY/SIMILARITY CLUSTERS    CMB7 33889     SUM OF CLUSTER SOURCES
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SPECIES CONCENTRATIONS -  SITE: D0808S       DATE: 08/08/03    CMB7 33889
SAMPLE DURATION         4        START HOUR         8          SIZE:    VOC
       R SQUARE        .91     PERCENT MASS       27.1
     CHI SQUARE      3.71               DF          9

SPECIES-------I---MEAS-----------------CALC-------------RATIO C/M----RATIO R/U
VT     TOT    T *********+-510.51000 *********+- 96.91259    .27+-   .03    -7.2
V1     43224  *  41.01000+-  4.10000  48.95533+-  7.88948   1.19+-   .23      .9
V2     43220     23.23000+-  2.32000  48.63824+-  7.03889   2.09+-   .37     3.4
V3     43226     37.88000+-  3.79000  17.35533+-  2.25994    .46+-   .08    -4.7
V4     43243     53.12000+-  5.31000  41.68447+-  6.53019    .78+-   .15    -1.4
V5     43285  *  27.74000+-  2.77000  49.07550+-  6.71259   1.77+-   .30     2.9
V6     43242     28.95000+-  2.90000   1.48184+-   .20554    .05+-   .01    -9.4
V7     43230  *  35.02000+-  3.50000  33.52119+-  5.03266    .96+-   .17     -.2
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V8	43231	*	50.09000+- 5.01000	67.06525+- 8.50152	1.34+- .22	1.7
V9	43248	*	34.58000+- 3.46000	35.15901+- 4.26124	1.02+- .16	.1
V10	45201	*	596.18000+- 59.62000	358.02150+- 53.44566	.60+- .11	-3.0
V11	43250		93.66000+- 9.37000	9.56571+- 1.43591	.10+- .02	-8.9
V12	43232	*	68.79000+- 6.88000	56.95612+- 7.51458	.83+- .14	-1.2
V13	45202	*	389.27000+- 38.93000	373.54050+- 47.74342	.96+- .16	-.3
V14	43233	*	23.86000+- 23.86000	65.81693+- 10.84005	2.76+- 2.80	1.6
V15	45109	*	147.05000+- 14.71000	115.43420+- 17.34692	.78+- .14	-1.4
V16	43235	*	49.99000+- 5.00000	33.37157+- 4.57158	.67+- .11	-2.5
V17	45207		*********+-338.66000	28.25364+- 4.00753	.01+- .00	-9.9
V18	43238	*	18.08000+- 18.08000	24.45101+- 2.93399	1.35+- 1.36	.3

SOURCE CONTRIBUTION ESTIMATES - SITE: D0808S DATE: 08/08/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .97 PERCENT MASS 30.0
CHI SQUARE 1.22 DF 6

SOURCE *	TYPE	SCE(UG/M3)	STD ERR	TSTAT
4	FB	364.3153	89.3843	4.0758
7	BB	894.9539	287.8121	3.1095
8	BBQ	269.8639	62.1239	4.3440

MEASURED CONCENTRATION FOR SIZE: VOC
5105.1+- 510.5

UNCERTAINTY/SIMILARITY CLUSTERS CMB7 33889 SUM OF CLUSTER SOURCES

SPECIES CONCENTRATIONS - SITE: D0808S DATE: 08/08/03 CMB7 33889
SAMPLE DURATION 4 START HOUR 8 SIZE: VOC
R SQUARE .97 PERCENT MASS 30.0
CHI SQUARE 1.22 DF 6

SPECIES	TOT	I T	MEAS	CALC	RATIO C/M	RATIO R/U
V1	43224	*	41.01000+- 4.10000	41.19363+- 5.98844	1.00+- .18	.0
V2	43220		23.23000+- 2.32000	44.10497+- 5.89378	1.90+- .32	3.3
V3	43226		37.88000+- 3.79000	17.78562+- 2.38559	.47+- .08	-4.5
V4	43243		53.12000+- 5.31000	50.95154+- 8.80710	.96+- .19	-.2
V5	43285		27.74000+- 2.77000	60.28907+- 8.84670	2.17+- .39	3.5
V6	43242		28.95000+- 2.90000	1.41896+- .21217	.05+- .01	-9.5
V7	43230	*	35.02000+- 3.50000	35.53426+- 5.25612	1.01+- .18	.1
V8	43231	*	50.09000+- 5.01000	60.56446+- 7.13102	1.21+- .19	1.2
V9	43248	*	34.58000+- 3.46000	33.26138+- 3.85409	.96+- .15	-.3
V10	45201		596.18000+- 59.62000	432.44420+- 71.86281	.73+- .14	-1.8
V11	43250		93.66000+- 9.37000	7.58587+- 1.08842	.08+- .01	-9.1
V12	43232	*	68.79000+- 6.88000	51.03410+- 6.07792	.74+- .12	-1.9
V13	45202	*	389.27000+- 38.93000	440.36380+- 61.52681	1.13+- .19	.7
V14	43233	*	23.86000+- 23.86000	50.44341+- 7.60931	2.11+- 2.14	1.1
V15	45109	*	147.05000+- 14.71000	132.36160+- 19.14676	.90+- .16	-.6
V16	43235		49.99000+- 5.00000	28.38154+- 3.54234	.57+- .09	-3.5
V17	45207		*********+-338.66000	33.85292+- 4.78140	.01+- .00	-9.9
V18	43238	*	18.08000+- 18.08000	23.24983+- 2.69145	1.29+- 1.29	.3

APPENDIX E

Chromatogram of All Samples
(Electronic file on CD)

BIOGRAPHY

Ms. Panwadee Suwattiga was born on June 29, 1958. She received her Bachelor of Science Degree in General Science (Major: Chemistry and Biology), Chulalongkorn University, Bangkok, Thailand in 1980. She worked as Factory Inspector at Industrial Works Departments for 5 years and continued her studies in Environmental Science, Graduate school, Chulalongkorn University. She got Master of Science Degree in 1988. She since has worked as environmental scientist and studied for Doctoral Degree of Environmental Management, Graduate school, Chulalongkorn University since 2000.