Table SI-1. k_{OH}, a, F, and SOA yield values for VOCs. Not all VOCs are listed. Yields are for M_o = 5 μg/m3. "(E)" indicates that the values are estimated.

Species	**k_{OH} (× 10^{12} cm^3 $molecules^{-1}$ s^{-1})**	**a**	**F**	**Y (%)**
CO	0.24	1.0	1	0
methane	0.0063	2.0	1	0
ethane	0.3	2.0	0.98	0
propane	1.1	2.0	0.96	0
n-butane	2.4	2.85	0.92	0
n-pentane	4.0	2.85 (E)	0.90	0
n-hexane	5.5	2.85 (E)	0.86	0
n-heptane	7.0	2.85 (E)	0.82	0
n-octane	8.7	2.85 (E)	0.77	0
n-nonane	10	2.85 (E)	0.75 (E)	0.3
n-decane	11.2	2.85 (E)	0.7 (E)	0.7
n-undecane	12.0	2.85 (E)	0.7 (E)	1.6
n-dodecane	13.0	2.85 (E)	0.7 (E)	2.8
isobutane	2.2	2.85 (E)	0.93	0
isopentane	3.7	2.85 (E)	0.93 (E)	0
2-methylpentane	5.4	2.85 (E)	0.86 (E)	0
2,2,4-trimethylpentane	9.0	2.85 (E)	0.86 (E)	0.1
cyclopentane	5.0	2.85 (E)	0.9 (E)	0
methylcyclopentane	5.7	2.85 (E)	0.85 (E)	0
cyclohexane	7.2	2.85 (E)	0.83 (E)	0
methylcyclohexane	10.0	2.85 (E)	0.83 (E)	0
ethene	9	2.0	0.99	0
propene	26	2.0	0.99	0
1-butene	31	2.0	0.98	0
trans-2-butene	64	2.0	0.97 (E)	0
cis-2-butene	56	2.0	0.96 (E)	0
1-pentene	31	2.0	0.95 (E)	0
trans-2-pentene	67	2.0	0.95 (E)	0
cis-2-pentene	65	2.0	0.95 (E)	0

1-hexene	37	2.0	0.93 (E)	0
trans-2-hexene	62	2.0	0.93 (E)	0
1-heptene	42	2.0	0.93 (E)	0
1,3-butadiene	67	2.0	0.93	0
benzene	1.2	2.0	0.9 (E)	10.6
toluene	6	2.0	0.9 (E)	6.1
o-xylene	13.7	2.0	0.9 (E)	3.6
m- and p-xylene	19	2.0	0.9 (E)	3.6
ethylbenzene	7.1	2.0	0.9 (E)	2.9
m- and p-ethyltoluene	15.6	2.0	0.9 (E)	1.4
o ethyltoluene	12.3	2.0	0.9 (E)	1.4
1,2,3 trimethylbenzene	58	2.0	0.9 (E)	1.4
1,2,4 trimethylbenzene	58	2.0	0.9 (E)	1.4
1,3,5 trimethylbenzene	33	2.0	0.9 (E)	1.4
isoprene	101	2.0	0.96	0.15 (Carlton)
limonene	171	2.0	0.9	6.1 (Griffin)
a-pinene	53.7	2.85	0.82	2.4
Formaldehyde	8	1.0	1	0
Acetaldehyde	16	3.0	1	0
Acetone	0.2	2.85 (E)	1	0

Table SI-2. P(SOA)/P(O_x) calculations for VOCs measured at 06:30, 29 March 2006 at the T0 supersite in Mexico City. For the sake of producing atmospherically realistic absolute values for P(O_x) and P(SOA), OH concentrations of 10^6 and 6×10^6 molecules/cm^3 were used for the Mexico City (T0) and La Porte calculations, respectively, though the calculated ratio from eq. 9 is not affected by the choice of [OH]. SOA yields are based on M_o = 5 μg/m^3. Not all VOCs are listed.

Species	**Mixing ratio (ppbv)**	**P(O_x)** pptv/s	**%**	**P(SOA)** 10^{-6} μg m^{-3}/s	**%**
CO	3500	**0.8**	**8.0**	**0**	**0**
ethane	27.3	0.02	0.1	0	0
propane	205	0.44	4.1	0	0
n-butane	20.8	0.55	5.3	0	0
n-pentane	12.7	0.13	1.2	0	0
n-hexane	10.0	0.14	1.3	0	0
n-decane	0.34	0	0	0.2	0.1
n-undecane	0.44	0.04	0.4	2.4	1.2
n-dodecane	0.78	0.02	0.2	2.2	1.1
Alkanes Total		**2.9**	**27.3**	**10.5**	**5.3**
ethene	40.3	0.7	6.8	0	0
propene	9.40	0.5	4.5	0	0
Alkenes total		**4.0**	**38.1**	**0.5**	**0.2**
benzene	16	0.04	0.3	7.1	3.5
toluene	40	0.43	4.1	60.2	30.3
C2 benzenes	23.2	0.71	6.8	66.3	33.3
C3-benzenes	13.2	0.55	5.2	23.9	12.0
Aromatics total		**1.9**	**18.2**	**167**	**84.2**
Formaldehyde	8	0.06	0.6	0	0
Acetaldehyde	8.4	0.40	3.8	0	0
Acetone	16	0.01	0.1	0	0
OVOC total		**0.5**	**4.5**	**0**	**0**
isoprene	0.33	0.06	0.6	0.2	0

limonene	0	0	0	0	0
α-pinene	2.6	0.3	3.1	20.4	10.3
Biogenics total		**0.4**	**3.7**	**20.6**	**10.3**
Total		**10.5**	**100**	**197**	**100**
P(SOA)/P(O_x)		**19**			
(ug m^{-3}/ppmv)					

Table SI-3. P(SOA)/P(O_x) calculations for selected VOCs (not all) measured at La Porte at 14:00, 30 August 2000. An [OH] value of 6×10^6 molecules/cm^3 and an M_o value of 5 $\mu g/m^3$ was used for the calculations.

Species	**Mixing ratio (ppbv)**	**P(O_x)** pptv/s	**%**	**P(SOA)** 10^{-6} µg m^{-3}/s	**%**
CO	**210**	**0.30**	**2.6**	**0**	**0**
ethane	13.1	0.05	0.4	0	0
propane	5.2	0.07	0.6	0	0
n-butane	2.6	0.10	0.8	0	0
n-pentane	4.3	0.27	2.2	0.01	0
n-hexane	1.0	0.08	0.7	0.02	0
n-decane	0.1	0.01	0.1	0.4	1.5
Alkanes Total		**1.4**	**12.1**	**0.64**	**2.6**
ethene	25.7	2.75	23.2	0	0
propene	6.2	1.91	16.1	0	0
Alkenes total		**5.8**	**48.4**	**0.04**	**0.1**
benzene	1.2	0.02	0.1	3.1	12.5
toluene	1.0	0.06	0.5	8.6	34.9
xylenes	0.34	0.06	0.5	5.9	24.0
ethyl-benzenes	0.14	0.01	0	0.8	3.2
isopropyl-benzene	0.25	0.02	0.1	1.5	6.1
trimethyl-benzenes	0.05	0.02	0.1	0.9	3.7
Aromatics total		**0.19**	**1.6**	**20.8**	**84.6**
formaldehyde	28	1.34	11.3	0	0
acetaldehyde	7.1	2.04	17.1	0	0
acetone	12.3	0.05	0.4	0	0
OVOC total		**3.9**	**33.1**	**0.04**	**0.2**

isoprene	0.19	0.22	2.1	0.53	2.2
limonene	0.003	0	0	1.13	4.6
α-pinene	0.03	0.02	0.2	1.41	5.7
Biogenic VOCs		**0.25**	**2.1**	**3.1**	**12.5**
Total		**11.9**	**100**	**24.6**	**100**
P(SOA)/P(O_x)		**2.1**			
(ug m^{-3}/ppmv)					