Supplementary Information

S1. Laboratory characterizations of NO, NO_2 and ozone interferences

S1.1 NO interference

To quantify the NO interference, NO from a standard gas cylinder (Air Liquide, Krefeld, Germany) was added to the CRM system running in C2 mode at pyrrole/OH ≈ 2.0. The mixing ratios of the added NO were ~0, 5, 10, 15, 20, 30, 90, 140, 170, 220, 350 ppb. The resulting decrease in pyrrole mixing ratio (ΔC3 in ppb) vs. the NO mixing ratio resulted in a polynomial relationship of the form $\Delta C3 = a[NO]^2 + b[NO]$. During AQABA: a ≈ -3E-4; b ≈ 0.17.

S1.2 NO_2 interference

To quantify the NO_2 interference, NO_2 from a standard gas cylinder (Westfalen AG, Münster, Germany) was added to the CRM system running in C2 mode at pyrrole/OH ≈ 2.0. All tubes were flushed with NO_2 for several hours and the contact of the NO_2 with metal surfaces (pressure reducer, mass flow controller) was reduced to a minimum to avoid losses. To quantify the amount of NO_2 lost/converted to NO in the setup used, conversion to NO was monitored by an NO/NO_2 analyzer (Two-channel-chemiluminescence detector). 8−12 % of the NO_2 was converted to NO depending on the flows and mixing ratios used. This loss was corrected for when calculating the NO_2 mixing ratios in the reactor. The mixing ratios of the added NO_2 were ~0, 20, 40, 60, 100 ppb. The resulting decrease in pyrrole mixing ratio (ΔC3 in ppb) vs. the NO_2 mixing ratio resulted in a polynomial relationship of the form $\Delta C3 = a[NO_2]^2 + b[NO_2]$. During AQABA: a ≈ -2E-4; b ≈ 0.08.

S1.3 Ozone interference

Using an ozone generator (Thermo 49C O3 Calibrator, Thermo Environmenal Instruments LLC, Franklin, USA), ozone was added to the CRM system running in C2 mode at pyrrole/OH ≈ 2.0. Ozone mixing ratios used were ~ 0, 20, 30, 45, 90, 130, 180, 260, 350 ppb. The resulting decrease in pyrrole mixing ratio (ΔC3 in ppb) vs. the O_3 mixing ratio resulted in a linear relationship of the form $\Delta C3 = a[O_3]$. During AQABA: a ≈ 0.0058.

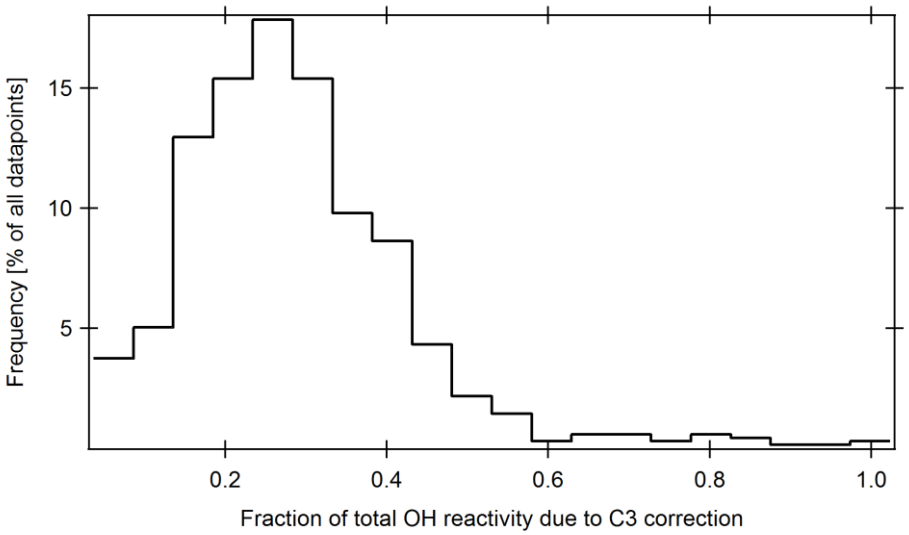

Figure S1. Frequency distribution of total OH reactivity fractions due to the NO, NO_2 and ozone corrections (C3 correction) for all datapoints in 50 min time resolution.

Table S1: Chemical species used for calculating speciated OH reactivity

Compound/ protonated mass (grey shaded compounds are gas standard calibrated with low uncertainty)	Chemical formula	k_{M+OH} [cm³ molecules^{-1} s^{-1}]	Instrument	Compounds attributed to protonated mass	If no unambiguous compound identification: reaction rate coefficient derived from…	Literature reference for reaction rate coefficent	Max. OH reactivity during AQABA [s^{-1}]	Comment
Alkanes								
Methane	CH_4	6.45E-15	Picarro Cavity ring-down spectroscopy instrument			IUPAC preferred value	0.35	
Ethane	C_2H_6	2.40E-13	GC-FID			IUPAC preferred value	0.26	
Propane	C_3H_8	1.10E-12	GC-FID			IUPAC preferred value	1.33	
2-Methylpropane	C_4H_{10}	2.12E-12	GC-FID			Atkinson and Arey, 2003	0.68	
n-Butane	C_4H_{10}	2.35E-12	GC-FID			IUPAC preferred value	1.42	
2-Methylbutane	C_5H_{12}	3.60E-12	GC-FID			Atkinson and Arey, 2003	0.92	
n-pentane	C_5H_{12}	3.80E-12	GC-FID			Atkinson and Arey, 2003	1.03	
2-Methylpentane	C_6H_{14}	5.20E-12	GC-FID			Atkinson and Arey, 2003	0.11	
n-hexane	C_6H_{14}	5.20E-12	GC-FID			Atkinson and Arey, 2003	0.16	
2,2,4-Trimethylpentane	C_8H_{18}	3.34E-12	GC-FID			Atkinson and Arey, 2003	0.004	
n-heptane	C_7H_{16}	6.76E-12	GC-FID			Atkinson and Arey, 2003	0.06	
Octane	C_8H_{18}	8.11E-12	GC-FID			Atkinson and Arey, 2003	0.04	
Alkenes and Alkynes								
Ethene	C_2H_4	7.50E-12	GC-FID			IUPAC preferred value	2.26	
Propene	C_3H_6	2.90E-11	GC-FID			IUPAC preferred value	1.11	
trans-2-butene	C_4H_8	6.40E-11	GC-FID			IUPAC preferred value	0.11	
1-Butene	C_4H_8	3.14E-11	GC-FID			IUPAC preferred value	0.26	
1-Pentene	C_5H_{10}	3.14E-11	GC-FID			Atkinson and Arey, 2003	0.10	
Isoprene	C_5H_8	1.00E-10	GC-FID			IUPAC preferred value	0.76	
27.023	C_2H_2	7.50E-13	PTR-ToF-MS	Ethyne		IUPAC preferred value	0.001	
41.0386	C_3H_4	6.95E-13	PTR-ToF-MS	Propyne; 1,2-Propadiene	average	Warnatz, 1984; Atkinson and Arey, 2003	0.27	
67.0543	C_5H_6	5.16E-11	PTR-ToF-MS	1,3-Cyclopentadiene; 3-penten-2-yne	average	Grosjean and Williams, 1992; Boodaghians et al., 1987	0.35	

69.0699	C_5H_8	5.10E-11	PTR-ToF-MS	1-Pentyne; 1,2-Pentadiene; 1,4-Pentadiene; 1,3-Pentadiene; Cyclopentene	average	Boodaghians et al., 1987; Rogers, 1989; Ohta, 1983; Atkinson and Arey, 2003	1.92	C_5 dienes. Isoprene measured by GC-FID was subtracted
83.0856	C_6H_{10}	8.69E-11	PTR-ToF-MS	Cyclohexene, 1-methyl-cyclopentene; 2,3-dimethylbutadiene; 2-methyl-pentadiene; hexyne; 2-methyl-1,4-pentadiene; 3-methyl-1,3-pentadiene; 4-methyl-1,3-pentadiene; 1,2-hexadiene; 2-4-hexadiene; 1,4-hexadiene; 1,3-hexadiene; 1,5-Hexadiene	average	Atkinson and Arey, 2003; Boodaghians et al., 1987	3.13	C_6 dienes
85.1012	C_6H_{12}	6.63E-11	PTR-ToF-MS	2-Methyl-2-pentene; 2-Methyl-1-pentene; 3-Methyl-2-pentene; 2-Ethyl-1-butene; 2,3-Dimethyl-2-butene; 1-Hexene; 2-Hexene; 3-Hexene; 4-Methyl-2-pentene	average	Atkinson and Arey, 2003 Ohta, 1983; Grosjean and Williams, 1992	0.57	C_6 alkenes
95.0856	C_7H_{10}	4.68E-11	PTR-ToF-MS	2-Norbornene		Atkinson et al., 1983	0.76	
97.1012	C_7H_{12}	7.98E-11	PTR-ToF-MS	1-methyl-cyclohexene; cycloheptene; 2-methyl-1,5-hexadiene; 2,4-dimethyl-1,3-pentadiene	average	Aschmann et al., 2012; Atkinson and Arey, 2003; Grosjean and Williams, 1992	2.27	C_7 dienes
109.1012	C_8H_{12}	1.07E-10	PTR-ToF-MS	Bicyclo[2.2.2]oct-2-ene; 1,2,3-Trimethylcyclopentadiene	average	Atkinson and Arey, 2003; Grosjean and Williams, 1992	3.82	
111.1169	C_8H_{14}	1.20E-10	PTR-ToF-MS	Z-Cyclooctene; 2,5-Dimethyl-2,4-hexadiene; 2,5-Dimethyl-1,5-hexadiene		Aschmann et al., 2012; Atkinson and Arey, 2003	1.89	C_8 dienes
137.1325	$C_{10}H_{16}$	3.73E-10	PTR-ToF-MS	1,3,7-Octatriene; α-Pinene	average	IUPAC preferred value; Peeters et al., 2007	3.07	
205.1951	$C_{15}H_{24}$	1.01E-10	PTR-ToF-MS	β-caryophyllene; α-copaene; α-cedrene; α-humulene; E-β-farnesene; Longifolene		Atkinson and Arey, 2003; IUPAC preferred values	1.10	Sesquiterpenes
Aromatic Compounds								
m- and p-Xylene	C_8H_{10}	1.87E-11	GC-FID		average	Atkinson and Arey, 2003	0.26	

69.0335	C_4H_4O	4.04E-11	PTR-ToF-MS	Furan		Atkinson, 1986	0.28	
Benzene	C_6H_6	1.20E-12	GC-FID			IUPAC preferred value	0.03	
80.0495	C_5H_5N	5.31E-13	PTR-ToF-MS	Pyridine		Yeung and Elrod, 2003	0.002	
83.0492	C_5H_6O	9.00E-11	PTR-ToF-MS	3-methyl-furan		Atkinson et al., 1989	0.79	
Toluene	C_7H_8	5.60E-12	GC-FID			IUPAC preferred value	0.23	
94.0652	C_6H_7N	5.68E-11	PTR-ToF-MS	Aniline; 4-methyl-pyridine; 3-methyl-pyridine; 2-methyl-pyridine	average of methylpyridines and aniline rate coefficients	Witte et al., 1986; Yeung and Elrod, 2003	0.32	
95.0492	C_6H_6O	2.80E-11	PTR-ToF-MS	Phenol		IUPAC preferred value	0.87	
97.0648	C_6H_8O	1.25E-10	PTR-ToF-MS	2,5-dimethylfuran		Aschmann et al., 2011	0.86	
105.0731	C_8H_8	5.80E-11	PTR-ToF-MS	Styrene		Atkinson and Arey, 2003	0.66	
107.0492	C_7H_6O	1.26E-11	PTR-ToF-MS	Benzaldehyde		IUPAC preferred value	0.23	
107.0855	C_8H_{10}	1.36E-11	PTR-ToF-MS	o-Xylene		Atkinson and Arey, 2003	0.35	m- and p-Xylene mixing ratios measured by GC-FID were subtracted
108.0808	C_7H_9N	9.60E-12	PTR-ToF-MS	2,6-dimethylpyridine; 2,4-dimethylpyridine; 2,3-dimethylpyridine; 2,5-dimethylpyridine	average	Yeung and Elrod, 2003	0.20	
119.0856	C_9H_{10}	5.95E-11	PTR-ToF-MS	α-methylstyrene; β-methylstyrene	average	Bignozzi et al., 1981	0.72	
121.0648	C_8H_8O	1.61E-11	PTR-ToF-MS	4-methylbenzaldehyde; 3-methylbenzaldehyde; 2-methylbenzaldehyde; acetophenone	average	Clifford et al., 2005; Aschmann et al., 2010	0.20	
121.1012	C_9H_{12}	5.70E-11	PTR-ToF-MS	1,3,5-trimethylbenzene		Atkinson and Arey, 2003	0.91	
123.0441	$C_7H_6O_2$	1.20E-12	PTR-ToF-MS	benzoic acid	rate coefficient of benzene	IUPAC preferred value	0.005	
125.0961	$C_8H_{12}O$	4.04E-11	PTR-ToF-MS	2,3,4,5-tetramethylfuran	rate coefficient of furan	Atkinson, 1986	0.14	
129.0699	$C_{10}H_8$	2.30E-11	PTR-ToF-MS	Naphthalene		Atkinson and Arey, 2003	0.07	
131.0856	$C_{10}H_{10}$	2.30E-11	PTR-ToF-MS	Dihydronaphthalene	rate coefficient of naphthalene	Atkinson and Arey, 2003	0.07	

133.1012	$C_{10}H_{12}$	3.37E-11	PTR-ToF-MS	Tetralin; 2-methyl-1-propenylbenzene	average	Atkinson and Arey, 2003; Chiorboli et al., 1983	0.19	
135.0805	$C_9H_{10}O$	3.0E-11	PTR-ToF-MS	Dimethylbenzaldehyde	average	Tse et al., 1997; Aschmann et al., 2010	0.18	
135.1169	$C_{10}H_{14}$	3.70E-11	PTR-ToF-MS	tert-butylbenzene; p-cymene; 1,2,3,5-tetramethylbenzene; 1,2,3,4-tetramethylbenzene	average	Alarcón et al., 2015; Atkinson and Arey, 2003	1.02	
143.0856	$C_{11}H_{10}$	5.08E-11	PTR-ToF-MS	2-methyl-Naphthalene; 1-methyl-naphthalene	average	Atkinson and Aschmann, 1986; Phousongphouang and Arey, 2002	0.94	
147.1169	$C_{11}H_{14}$	5.80E-11	PTR-ToF-MS	4-isopropyl styrene; 3-pentenyl benzene	rate coefficient of styrene	Atkinson and Arey, 2003	1.15	
149.1325	$C_{11}H_{16}$	1.10E-10	PTR-ToF-MS	Pentamethylbenzene		Alarcón et al., 2015	2.23	
161.1325	$C_{12}H_{16}$	5.80E-11	PTR-ToF-MS	4-tert-butylstyrene	rate coefficient of styrene	Atkinson and Arey, 2003	1.31	
163.1482	$C_{12}H_{18}$	1.13E-10	PTR-ToF-MS	Hexamethylbenzene		Atkinson and Arey, 2003	1.30	
175.1482	$C_{13}H_{18}$	3.85E-11	PTR-ToF-MS	1-2,2-dimethyl-1-methylenepropyl-4-methyl-benzene; 2-tert-butyl-indan	average of indan and styrene rate coefficients	Atkinson and Arey, 2003	1.02	
189.1638	$C_{14}H_{20}$	4.60E-11	PTR-ToF-MS	3,5-dimethyl-t-butylstyrene; 1-t-butyltetralin	average of styrene and tetralin rate coefficients	Atkinson and Arey, 2003	0.591	
197.1325	$C_{15}H_{16}$	4.15E-12	PTR-ToF-MS	1,1'-1,3-propanediylbis-Benzene; 4-1-methylethyl-1,1'-Biphenyl	average of benzene and biphyenyl	Atkinson and Arey, 2003; IUPAC preferred value	0.003	
199.1482	$C_{15}H_{18}$	2.30E-11	PTR-ToF-MS	substituted naphthalenes	rate coefficient of naphthalene	Atkinson and Arey, 2003	0.05	
OVOCs								
Formaldehyde	HCHO	8.50E-12	Aerolaser Hantzsch			IUPAC preferred value	2.33	
33.0335	CH_3OH	9.00E-13	PTR-ToF-MS	Methanol		IUPAC preferred value	0.24	
45.0335	C_2H_4O	1.50E-11	PTR-ToF-MS	Acetaldehyde		IUPAC preferred value	2.21	
47.0128	HCOOH	4.50E-13	PTR-ToF-MS	Formic acid		IUPAC preferred value	0.07	
57.0335	C_3H_4O	1.13E-11	PTR-ToF-MS	Acrolein		Atkinson and Arey, 2003	1.51	
59.0491	C_3H_6O	1.80E-13	PTR-ToF-MS	Acetone		IUPAC preferred value	0.16	
61.0285	$C_2H_4O_2$	6.90E-13	PTR-ToF-MS	Acetic acid		IUPAC preferred value	0.13	
63.0441	$C_2H_6O_2$	1.45E-11	PTR-ToF-MS	1,2-ethanediol		IUPAC preferred value	0.18	

65.0233	CH_4O_3	7.10E-12	PTR-ToF-MS	Hydroxymethyl hydroperoxide		Allen et al., 2018	0.14	
71.0491	C_4H_6O	2.45E-11	PTR-ToF-MS	Methyl vinyl ketone; methacroleine; isoprene hydroxy hydroperoxide	average	IUPAC preferred values; St Clair et al., 2016	0.42	
73.0284	$C_3H_4O_2$	1.30E-11	PTR-ToF-MS	Methyl glyoxal		IUPAC preferred value	0.21	
73.0648	C_4H_8O	4.87E-11	PTR-ToF-MS	Butanal; 2-methyl-propanal; tetrahydrofuran; 2-butanone (MEK); ethoxy ethene	average	IUPAC preferred value; Moriarty et al., 2003; Audley et al., 1981; Zhou et al., 2006	1.80	C_4 carbonyls
75.0441	$C_3H_6O_2$	2.85E-12	PTR-ToF-MS	Hydroxyacetone; propanoic acid	average	IUPAC preferred values	0.10	
77.0598	$C_3H_8O_2$	1.62E-11	PTR-ToF-MS	2-methoxyethanol; 1,2-propanediol		IUPAC preferred value, Porter et al., 1997	0.07	
85.0648	C_5H_8O	4.43E-11	PTR-ToF-MS	Cyclopentanone; E-2-pentenal; 3-methyl-3-buten-2-one; E-2-methyl-2-butenal; 3-methyl-2-butenal; 3-penten-2-one; 1-penten-3-one; 3,6-dihydro-2H-pyran	average	Atkinson and Arey, 2003; Grosjean and Williams, 1992; Jiménez et al., 2009; Davis et al., 2007	0.52	
87.0441	$C_4H_6O_2$	2.40E-11	PTR-ToF-MS	2,3-Butanedione; acetic acid ethenyl ester; 2-propenoic acid methyl ester; 4-hydroxy-2-butenal	average	Baker et al., 2005a; Teruel et al., 2006; Blanco et al., 2009; Dagaut et al., 1988	0.61	C_4 dioxygenates
87.0805	$C_5H_{10}O$	4.63E-11	PTR-ToF-MS	Pentanal; 3-methyl-2-butanone; 3-pentanone; 2-pentanone; 1-vinyloxypropane; 2-Methyl-3-buten-2-ol MBO; 3-methyl-3-buten-1-ol; 2-methylbutanal; 3-methylbutanal; 1-penten-3-ol; Z-2-penten-1-ol	average	Zhou et al., 2006; IUPAC; Cometto et al., 2008; Atkinson and Arey, 2003; Orlando et al., 2001	2.48	
89.0234	$C_3H_4O_3$	1.20E-13	PTR-ToF-MS	Pyruvic acid		IUPAC preferred value	0.001	
89.0598	$C_4H_8O_2$	6.47E-12	PTR-ToF-MS	1,4-dioxane; formic acid 1-methylethyl ester; ethyl acetate; butyric acid; acetoin; 1-hydroxy-3-butanone	average	Picquet et al., 1998; Aschmann et al., 2000; IUPAC; Moriarty et al., 2003; Pimentel et al., 2010	0.10	
91.039	$C_3H_6O_3$	9.85E-13	PTR-ToF-MS	carbonic acid dimethyl ester; methyoxymethyl formate	average	Katrib et al., 2002; O'Donnel et al., 2004	0.003	
99.0805	$C_6H_{10}O$	4.76E-11	PTR-ToF-MS	Cyclohexanone; 5-hexen-2-	average	Atkinson and Arey, 2003;	0.59	

				one; z-3-methyl-3-penten-2-one; 4-methyl-3-penten-2-one; E-2-hexenal; Z-3-hexenal; 2-ethyl-2-butenal; E-4-hexene-3-one		Grosjean and Williams, 1992; Wang et al., 2010; Gao et al., 2009; Xing et al., 2012		
101.0598	$C_5H_8O_2$	3.17E-11	PTR-ToF-MS	Methyl methacrylate; E-2-butenoic acid methyl ester; acetylacetone; 2-propenoic acid ethyl ester; glutaraldehyde; vinyl propionate; isopropenyl acetate; n-propenyl acetate	average	Teruel et al., 2006; Teruel et al., 2012; Rogers, 1989; Ferrari et al., 1996; Dagaut et al., 1988	1.52	C_5 dioxygenates
101.0961	$C_6H_{12}O$	4.11E-11	PTR-ToF-MS	Oxepane; 2-hexanone; hexanal; t-butyl vinyl ether;2-methylpentanal; 3-methylpentanal; 4-methylpentanal; 3,3-dimethylbutanal; 2-ethylbutanal	average	Moriarty et al., 2003; Atkinson and Arey, 2003; Zhou et al., 2012; Le Calvé et al., 1998	0.95	C_6 oxygenates/ carbonyls
103.0754	$C_5H_{10}O_2$	8.71E-12	PTR-ToF-MS	Butanoic acid methyl ester; n-propyl acetate; 1-hydroxy-2-methyl-3-butanone; 1-hydroxy-3-methyl-2-butanone; 1,2-dioxepane; 5-hydroxy-2-pentanone	average	Schütze et al., 2010; Ferrari et al., 1996; Moriarty et al., 2003; Aschmann et al., 2000; Baker et al., 2005b	0.14	
113.0598	$C_6H_8O_2$	5.80E-11	PTR-ToF-MS	E-hexendione; Z-hexendione	average	Tuazon et al., 1985	0.23	
113.0961	$C_7H_{12}O$	2.52E-11	PTR-ToF-MS	E-2-Hepten-1-al; cycloheptanone	average	Davis et al., 2007; Atkinson and Arey, 2003	0.16	
115.0754	$C_6H_{10}O_2$	3.40E-11	PTR-ToF-MS	2,5-hexanedione; ethyl-2-butenoate; methacrylic acid ethyl ester	average	Dagaut et al., 1988; Teruel et al., 2012; Blanco et al., 2006	0.97	
117.0911	$C_6H_{12}O_2$	7.42E-12	PTR-ToF-MS	4-hydroxy-3-hexanone; acetic acid butyl ester; butanoic acid ethyl ester; methyl valerate	average	Schütze et al., 2010; Aschmann et al., 2000; Veillerot et al., 1996; Ferrari et al., 1996	0.13	
127.1118	$C_8H_{14}O$	9.88E-11	PTR-ToF-MS	E-2-octenal; cyclooctanone; 6-methyl-5-hepten-2-one	average	Gao et al., 2009; Smith et al., 1996	1.87	

129.1274	$C_8H_{16}O$	1.10E-11	PTR-ToF-MS	2-octanone		Atkinson and Arey, 2003	0.03	
141.1274	$C_9H_{16}O$	4.35E-11	PTR-ToF-MS	Nonenal		Gao et al., 2009	0.07	
143.1067	$C_8H_{14}O_2$	7.08E-11	PTR-ToF-MS	Butyl methacrylate		Blanco et al., 2009	1.14	
143.1431	$C_9H_{18}O$	2.41E-11	PTR-ToF-MS	Nonanal, 1-nonanone	average	Bowman et al., 2003; Wallington and Kurylo, 1987	0.11	
201.1485	$C_{11}H_{20}O_3$	7.35E-12	PTR-ToF-MS	C_{11} oxo esters e.g. 9-oxo-nonanoic acid ethyl ester	rate coefficient of acetic acid n-pentyl ester	Williams et al., 1993	0.06	
Sulfur-containing VOCs								
63.0263	C_2H_6S	4.80E-12	PTR-ToF-MS	Dimethyl sulfide		IUPAC preferred value	0.06	
80.9879	CH_4S_2	3.30E-11	PTR-ToF-MS	Methanedithiol	Rate constant of methanethiol	Atkinson et al., 2004	0.10	
NVOCs								
42.0338	C_2H_3N	2.20E-14	PTR-ToF-MS	Acetonitrile		IUPAC preferred value	0.001	
46.0288	CH_3NO	1.50E-12	PTR-ToF-MS	Formamide		Nizamov and Dagdigian, 2003	0.02	
54.0339	C_3H_3N	4.04E-12	PTR-ToF-MS	Acrylonitrile		Harris et al., 1981	0.01	
56.0495	C_3H_5N	2.56E-13	PTR-ToF-MS	Propanenitrile		Sun et al., 2008	0.01	
60.0444	C_2H_5NO	6.05E-12	PTR-ToF-MS	Acetamide; N-methyl-formamide	average	Solignac et al., 2005; Barnes et al., 2010	0.41	
62.0237	CH_3NO_2	2.60E-13	PTR-ToF-MS	Methyl nitrite		Nielsen et al., 1991	0.01	
70.0652	C_4H_7N	2.56E-13	PTR-ToF-MS	butanenitrile	rate coefficient of propanenitrile	Sun et al., 2008	0.001	
74.0601	C_3H_7NO	1.25E-11	PTR-ToF-MS	N,N-dimethyl formamide, N-methyl acetamide	average	Solignac et al., 2005; Barnes et al., 2010	0.08	
84.0808	C_5H_9N	2.56E-13	PTR-ToF-MS	Pentanenitrile	rate coefficient of propanenitrile	Sun et al., 2008	0.001	
136.1121	$C_9H_{13}N$	1.11E-10	PTR-ToF-MS	N-Ethyl-N-methylaniline	rate coefficient of aniline	Witte et al., 1986	0.35	
150.1278	$C_{10}H_{15}N$	1.48E-10	PTR-ToF-MS	Benzenamine, N,N,2,6-tetramethyl-	rate coefficient of N-N-dimethylbenzenamine	Atkinson et al., 1987	0.33	
Halogenated VOCs								

99.0053	CF_3CHO	1.50E-11	PTR-ToF-MS	Trifluoroacetaldehyde	rate coefficient of acetaldehyde	IUPAC preferred value	0.16	
101.0209	$C_2H_3F_3O$	1.23E-13	PTR-ToF-MS	2,2,2-trifluoroethanol		Sellevåg et al., 2004	0.002	
113.0153	C_6H_5Cl	6.02E-13	PTR-ToF-MS	Chlorobenzene		Bryukov et al., 2009	0.003	
129.0102	C_6H_5ClO	1.32E-11	PTR-ToF-MS	2-chlorophenol; 3-chlorophenol; 4-chlorophenol	average	Kiliç et al., 2007	0.07	
NO_x								
Nitric oxide	NO	9.70E-12	Two-channel CLD			IUPAC preferred value	29.3	
Nitrogen dioxide	NO_2	9.80E-12	Two-channel CLD			IUPAC preferred value	6.94	
Other inorganic compounds								
Ozone	O_3	7.30E-14	UV Photometric O_3 Analyzer			IUPAC preferred value	0.26	
Nitrous acid	HONO	6.00E-12	Long Path Absorption Photometer			IUPAC preferred value	0.13	
Sulfur dioxide	SO_2	9.30E-13	Chemical Ionization Mass Spectrometer			IUPAC preferred value	0.33	
Carbon monoxide	CO	1.44E-13	Picarro Cavity ring-down spectroscopy instrument			IUPAC preferred value	1.16	

References for reaction rate coefficients

Alarcón, P., Bohn, B., and Zetzsch, C.: Kinetic and mechanistic study of the reaction of OH radicals with methylated benzenes: 1,4-dimethyl-, 1,3,5-trimethyl-, 1,2,4,5-, 1,2,3,5- and 1,2,3,4-tetramethyl-, pentamethyl-, and hexamethylbenzene, Physical chemistry chemical physics PCCP, 17, 13053–13065, doi:10.1039/c5cp00253b, 2015.

Allen, H. M., Crounse, J. D., Bates, K. H., Teng, A. P., Krawiec-Thayer, M. P., Rivera-Rios, J. C., Keutsch, F. N., St Clair, J. M., Hanisco, T. F., Møller, K. H., Kjaergaard, H. G., and Wennberg, P. O.: Kinetics and Product Yields of the OH Initiated Oxidation of Hydroxymethyl Hydroperoxide, The journal of physical chemistry. A, 122, 6292–6302, doi:10.1021/acs.jpca.8b04577, 2018.

Aschmann, S. M., Arey, J., and Atkinson, R.: Atmospheric Chemistry of Selected Hydroxycarbonyls, J. Phys. Chem. A, 104, 3998–4003, doi:10.1021/jp9939874, 2000.

Aschmann, S. M., Arey, J., and Atkinson, R.: Extent of H-atom abstraction from OH+p-cymene and upper limits to the formation of cresols from OH+m-xylene and OH+p-cymene, ATMOSPHERIC ENVIRONMENT, 44, 3970–3975, doi:10.1016/j.atmosenv.2010.06.059, 2010.

Aschmann, S. M., Arey, J., and Atkinson, R.: Kinetics and products of the reactions of OH radicals with cyclohexene, 1-methyl-1-cyclohexene, cis-cyclooctene, and cis-cyclodecene, The journal of physical chemistry. A, 116, 9507–9515, doi:10.1021/jp307217m, 2012.

Aschmann, S. M., Nishino, N., Arey, J., and Atkinson, R.: Kinetics of the reactions of OH radicals with 2- and 3-methylfuran, 2,3- and 2,5-dimethylfuran, and E- and Z-3-hexene-2,5-dione, and products of OH + 2,5-dimethylfuran, Environmental science & technology, 45, 1859–1865, doi:10.1021/es103207k, 2011.

Atkinson, R.: Kinetics and mechanisms of the gas-phase reactions of the hydroxyl radical with organic compounds under atmospheric conditions, Chemical reviews, 86, 69–201, doi:10.1021/cr00071a004, 1986.

Atkinson, R. and Arey, J.: Atmospheric degradation of volatile organic compounds, Chemical reviews, 103, 4605–4638, doi:10.1021/cr0206420, 2003.

Atkinson, R. and Aschmann, S. M.: Kinetics of the reactions of naphthalene, 2-methylnaphthalene, and 2,3-dimethylnaphthalene with OH radicals and with O 3 at 295 ± 1 K, Int. J. Chem. Kinet., 18, 569–573, doi:10.1002/kin.550180507, 1986.

Atkinson, R., Aschmann, S. M., and Carter, W. P. L.: Effects of ring strain on gas-phase rate constants. 2. OH radical reactions with cycloalkenes, Int. J. Chem. Kinet., 15, 1161–1177, doi:10.1002/kin.550151105, 1983.

Atkinson, R., Aschmann, S. M., Tuazon, E. C., Arey, J., and Zielinska, B.: Formation of 3-Methylfuran from the gas-phase reaction of OH radicals with isoprene and the rate constant for its reaction with the OH radical, Int. J. Chem. Kinet., 21, 593–604, doi:10.1002/kin.550210709, 1989.

Atkinson, R., Baulch, D. L., Cox, R. A., Crowley, J. N., Hampson, R. F., Hynes, R. G., Jenkin, M. E., Rossi, M. J., and Troe, J.: Evaluated kinetic and photochemical data for atmospheric chemistry: Volume I - gas phase reactions of O_x, HO_x, NO_x and SO_x species, Atmos. Chem. Phys., 4, 1461–1738, doi:10.5194/acp-4-1461-2004, 2004.

Atkinson, R., Tuazon, E. C., Wallington, T. J., Aschmann, S. M., Arey, J., Winer, A. M., and Pitts, J. N.: Atmospheric chemistry of aniline, N,N-dimethylaniline, pyridine, 1,3,5-triazine, and nitrobenzene, Environ. Sci. Technol., 21, 64–72, doi:10.1021/es00155a007, 1987.

Audley, G. J., Baulch, D. L., and Campbell, I. M.: Gas-phase reactions of hydroxyl radicals with aldehydes in flowing H2O2+ NO2+ CO mixtures, J. Chem. Soc., Faraday Trans. 1, 77, 2541, doi:10.1039/f19817702541, 1981.

Baker, J., Arey, J., and Atkinson, R.: Formation and Reaction of Hydroxycarbonyls from the Reaction of OH Radicals with 1,3-Butadiene and Isoprene, Environ. Sci. Technol., 39, 4091–4099, doi:10.1021/es047930t, 2005a.

Baker, J., Arey, J., and Atkinson, R.: Rate constants for the reactions of OH radicals with a series of 1,4-hydroxyketones, Journal of Photochemistry and Photobiology A: Chemistry, 176, 143–148, doi:10.1016/j.jphotochem.2005.07.022, 2005b.

Barnes, I., Solignac, G., Mellouki, A., and Becker, K. H.: Aspects of the atmospheric chemistry of amides, Chemphyschem a European journal of chemical physics and physical chemistry, 11, 3844–3857, doi:10.1002/cphc.201000374, 2010.

Bignozzi, C. A., Maldotti, A., Chiorboli, C., Bartocci, C., and Carassiti, V.: Kinetics and mechanism of reactions between aromatic olefins and hydroxyl radicals, Int. J. Chem. Kinet., 13, 1235–1242, doi:10.1002/kin.550131204, 1981.

Blanco, M. B., Bejan, I., Barnes, I., Wiesen, P., and Teruel, M. A.: OH-initiated degradation of unsaturated esters in the atmosphere: Kinetics in the temperature range of 287-313 K, The journal of physical chemistry. A, 113, 5958–5965, doi:10.1021/jp901755x, 2009.

Blanco, M. B., Taccone, R. A., Lane, S. I., and Teruel, M. A.: On the OH-initiated degradation of methacrylates in the troposphere: Gas-phase kinetics and formation of pyruvates, Chemical Physics Letters, 429, 389–394, doi:10.1016/j.cplett.2006.08.088, 2006.

Boodaghians, R. B., Hall, I. W., Toby, F. S., and Wayne, R. P.: Absolute determinations of the kinetics and temperature dependences of the reactions of OH with a series of alkynes, J. Chem. Soc., Faraday Trans. 2, 83, 2073, doi:10.1039/f29878302073, 1987.

Bowman, J. H., Barket, D. J., and Shepson, P. B.: Atmospheric Chemistry of Nonanal, Environ. Sci. Technol., 37, 2218–2225, doi:10.1021/es026220p, 2003.

Bryukov, M. G., Knyazev, V. D., Gehling, W. M., and Dellinger, B.: Kinetics of the gas-phase reaction of OH with chlorobenzene, The journal of physical chemistry. A, 113, 10452–10459, doi:10.1021/jp9049186, 2009.

Chiorboli, C., Bignozzi, C. A., Maldotti, A., Giardini, P. F., Rossi, A., and Carassiti, V.: Rate constants for the gas-phase reactions of OH radicals with dimethylstyrene and acetone. Mechanism of dimethylstyrene NOx - air photooxidation, Int. J. Chem. Kinet., 15, 579–586, doi:10.1002/kin.550150608, 1983.

Clifford, G. M., Thüner, L. P., Wenger, J. C., and Shallcross, D. E.: Kinetics of the gas-phase reactions of OH and NO3 radicals with aromatic aldehydes, Journal of Photochemistry and Photobiology A: Chemistry, 176, 172–182, doi:10.1016/j.jphotochem.2005.09.022, 2005.

Dagaut, P., Wallington, T. J., Liu, R., and Kurylo, M. J.: A kinetic investigation of the gas-phase reactions of hydroxyl radicals with cyclic ketones and diones: Mechanistic insights, J. Phys. Chem., 92, 4375–4377, doi:10.1021/j100326a026, 1988.

Davis, M. E., Gilles, M. K., Ravishankara, A. R., and Burkholder, J. B.: Rate coefficients for the reaction of OH with E-2-pentenal, E-2-hexenal, and E-2-heptenal, Physical chemistry chemical physics PCCP, 9, 2240–2248, doi:10.1039/b700235a, 2007.

Ferrari, C., Roche, A., Jacob, V., Foster, P., and Baussand, P.: Kinetics of the reaction of OH radicals with a series of esters under simulated conditions at 295 K, Int. J. Chem. Kinet., 28, 609–614, doi:10.1002/(SICI)1097-4601(1996)28:8<609::AID-KIN6>3.0.CO;2-Z, 1996.

Gao, T., Andino, J. M., Rivera, C. C., and Márquez, M. F.: Rate constants of the gas-phase reactions of OH radicals with trans -2-hexenal, trans -2-octenal, and trans -2-nonenal, Int. J. Chem. Kinet., 41, 483–489, doi:10.1002/kin.20424, 2009.

Grosjean, D. and Williams, E. L.: Environmental persistence of organic compounds estimated from structure-reactivity and linear free-energy relationships. Unsaturated aliphatics, Atmospheric Environment. Part A. General Topics, 26, 1395–1405, doi:10.1016/0960-1686(92)90124-4, 1992.

Harris, G. W., Kleindienst, T. E., and Pitts, J. N.: Rate constants for the reaction of OH radicals with CH3CN, C2H5CN and CH2CH-CN in the temperature range 298–424 K, Chemical Physics Letters, 80, 479–483, doi:10.1016/0009-2614(81)85061-0, 1981.

IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation: Datasheets - gas phase: http://iupac.pole-ether.fr/, last access: 10 December 2018.

Jiménez, E., Lanza, B., Antiñolo, M., and Albaladejo, J.: Influence of temperature on the chemical removal of 3-methylbutanal, trans-2-methyl-2-butenal, and 3-methyl-2-butenal by OH radicals in the troposphere, ATMOSPHERIC ENVIRONMENT, 43, 4043–4049, doi:10.1016/j.atmosenv.2009.05.005, 2009.

Katrib, Y., Deiber, G., Mirabel, P., Le Calvé, S., George, C., Mellouki, A., and Le Bras, G.: Atmospheric Loss Processes of Dimethyl and Diethyl Carbonate, Journal of Atmospheric Chemistry, 43, 151–174, doi:10.1023/A:1020605807298, 2002.

Kiliç, M., Koçtürk, G., San, N., and Cinar, Z.: A model for prediction of product distributions for the reactions of phenol derivatives with hydroxyl radicals, Chemosphere, 69, 1396–1408, doi:10.1016/j.chemosphere.2007.05.002, 2007.

Le Calvé, S., Hitier, D., Le Bras, G., and Mellouki, A.: Kinetic Studies of OH Reactions with a Series of Ketones, J. Phys. Chem. A, 102, 4579–4584, doi:10.1021/jp980848y, 1998.

Moriarty, J., Sidebottom, H., Wenger, J., Mellouki, A., and Le Bras, G.: Kinetic Studies on the Reactions of Hydroxyl Radicals with Cyclic Ethers and Aliphatic Diethers, J. Phys. Chem. A, 107, 1499–1505, doi:10.1021/jp021267i, 2003.

Nielsen, O. J., Sidebottom, H. W., Donlon, M., and Treacy, J.: Rate constants for the gas-phase reactions of OH radicals and Cl atoms withn-alkyl nitrites at atmospheric pressure and 298 K, Int. J. Chem. Kinet., 23, 1095–1109, doi:10.1002/kin.550231204, 1991.

Nizamov, B. and Dagdigian, P. J.: Spectroscopic and Kinetic Investigation of Methylene Amidogen by Cavity Ring-Down Spectroscopy, J. Phys. Chem. A, 107, 2256–2263, doi:10.1021/jp022197i, 2003.

O'Donnel, S. M., Sidebottom, H. W., Wenger, J. C., Mellouki, A., and Le Bras, G.: Kinetic Studies on the Reactions of Hydroxyl Radicals with a Series of Alkoxy Esters, J. Phys. Chem. A, 108, 7386–7392, doi:10.1021/jp048782w, 2004.

Ohta, T.: Rate constants for reactions of diolefins with hydroxyl radicals in the gas phase. Estimate of the rate constants from those for monoolefins, J. Phys. Chem., 87, 1209–1213, doi:10.1021/j100230a023, 1983.

Orlando, J. J., Tyndall, G. S., and Ceazan, N.: Rate Coefficients and Product Yields from Reaction of OH with 1-Penten-3-ol, Z -2-Penten-1-ol, and Allyl Alcohol 2-Propen-1-ol, J. Phys. Chem. A, 105, 3564–3569, doi:10.1021/jp0041712, 2001.

Peeters, J., Boullart, W., Pultau, V., Vandenberk, S., and Vereecken, L.: Structure-activity relationship for the addition of OH to polyalkenes: Site-specific and total rate constants, J. Phys. Chem. A, 111, 1618–1631, doi:10.1021/jp066973o, 2007.

Phousongphouang, P. T. and Arey, J.: Rate Constants for the Gas-Phase Reactions of a Series of Alkylnaphthalenes with the OH Radical, Environ. Sci. Technol., 36, 1947–1952, doi:10.1021/es011434c, 2002.

Picquet, B., Heroux, S., Chebbi, A., Doussin, J.-F., Durand-Jolibois, R., Monod, A., Loirat, H., and Carlier, P.: Kinetics of the reactions of OH radicals with some oxygenated volatile organic compounds under simulated atmospheric conditions, Int. J. Chem. Kinet., 30, 839–847, doi:10.1002/(SICI)1097-4601(1998)30:11<839::AID-KIN6>3.0.CO;2-W, 1998.

Pimentel, A. S., Tyndall, G. S., Orlando, J. J., Hurley, M. D., Wallington, T. J., Sulbaek Andersen, M. P., Marshall, P., and Dibble, T. S.: Atmospheric chemistry of isopropyl formate and tert-butyl formate, Int. J. Chem. Kinet., 42, 479–498, doi:10.1002/kin.20498, 2010.

Porter, E., Wenger, J., Treacy, J., Sidebottom, H., Mellouki, A., Téton, S., and LeBras, G.: Kinetic Studies on the Reactions of Hydroxyl Radicals with Diethers and Hydroxyethers, J. Phys. Chem. A, 101, 5770–5775, doi:10.1021/jp971254i, 1997.

Rogers, J. D.: Rate constant measurements for the reaction of the hydroxyl radical with cyclohexene, cyclopentene, and glutaraldehyde, Environ. Sci. Technol., 23, 177–181, doi:10.1021/es00179a006, 1989.

Schütze, N., Zhong, X., Kirschbaum, S., Bejan, I., Barnes, I., and Benter, T.: Relative kinetic measurements of rate coefficients for the gas-phase reactions of Cl atoms and OH radicals with a series of methyl alkyl esters, ATMOSPHERIC ENVIRONMENT, 44, 5407–5414, doi:10.1016/j.atmosenv.2009.08.011, 2010.

Sellevåg, S. R., Nielsen, C. J., Søvde, O. A., Myhre, G., Sundet, J. K., Stordal, F., and Isaksen, I. S.A.: Atmospheric gas-phase degradation and global warming potentials of 2-fluoroethanol, 2,2-difluoroethanol, and 2,2,2-trifluoroethanol, ATMOSPHERIC ENVIRONMENT, 38, 6725–6735, doi:10.1016/j.atmosenv.2004.09.023, 2004.

Smith, A. M., Rigler, E., Kwok, E. S. C., and Atkinson, R.: Kinetics and Products of the Gas-Phase Reactions of 6-Methyl-5-hepten-2-one and trans -Cinnamaldehyde with OH and NO 3 Radicals and O 3 at 296 ± 2 K, Environ. Sci. Technol., 30, 1781–1785, doi:10.1021/es950871m, 1996.

Solignac, G., Mellouki, A., Le Bras, G., Barnes, I., and Benter, T.: Kinetics of the OH and Cl reactions with N-methylformamide, N,N-dimethylformamide and N,N-dimethylacetamide, Journal of Photochemistry and Photobiology A: Chemistry, 176, 136–142, doi:10.1016/j.jphotochem.2005.07.020, 2005.

St Clair, J. M., Rivera-Rios, J. C., Crounse, J. D., Knap, H. C., Bates, K. H., Teng, A. P., Jørgensen, S., Kjaergaard, H. G., Keutsch, F. N., and Wennberg, P. O.: Kinetics and Products of the Reaction of the First-Generation Isoprene Hydroxy Hydroperoxide ISOPOOH with OH, The journal of physical chemistry. A, 120, 1441–1451, doi:10.1021/acs.jpca.5b06532, 2016.

Sun, J., Tang, Y., Sun, H., Pan, Y., Jia, X., Pan, X., and Wang, R.: Mechanistic and kinetic study of the OH+C2H5CN reaction, Chemical Physics Letters, 463, 315–321, doi:10.1016/j.cplett.2008.08.055, 2008.

Teruel, M. A., Benitez-Villalba, J., Caballero, N., and Blanco, M. B.: Gas-phase oxidation of methyl crotonate and ethyl crotonate. kinetic study of their reactions toward OH radicals and Cl atoms, The journal of physical chemistry. A, 116, 6127–6133, doi:10.1021/jp2113889, 2012.

Teruel, M. A., Lane, S. I., Mellouki, A., Solignac, G., and Le Bras, G.: OH reaction rate constants and UV absorption cross-sections of unsaturated esters, ATMOSPHERIC ENVIRONMENT, 40, 3764–3772, doi:10.1016/j.atmosenv.2006.03.003, 2006.

Tse, C. W., Flagan, R. C., and Seinfeld, J. H.: Rate constants for the gas-phase reaction of the hydroxyl radical with a series of dimethylbenzaldehydes and trimethylphenols at atmospheric pressure, Int. J. Chem. Kinet., 29, 523–525, doi:10.1002/(SICI)1097-4601(1997)29:7<523::AID-KIN6>3.0.CO;2-W, 1997.

Tuazon, E. C., Atkinson, R., and Carter, W. P.: Atmospheric chemistry of cis- and trans-3-hexene-2,5-dione, Environmental science & technology, 19, 265–269, doi:10.1021/es00133a009, 1985.

Veillerot, M., Foster, P., Guillermo, R., and Galloo, J. C.: Gas-phase reaction ofn-butyl acetate with the hydroxyl radical under simulated tropospheric conditions: Relative rate constant and product study, Int. J. Chem. Kinet., 28, 235–243, doi:10.1002/(SICI)1097-4601(1996)28:4<235::AID-KIN1>3.0.CO;2-W, 1996.

Wallington, T. J. and Kurylo, M. J.: Flash photolysis resonance fluorescence investigation of the gas-phase reactions of hydroxyl radicals with a series of aliphatic ketones over the temperature range 240-440 K, J. Phys. Chem., 91, 5050–5054, doi:10.1021/j100303a033, 1987.

Wang, K., Ge, M., and Wang, W.: Kinetics of the gas-phase reactions of 5-hexen-2-one with OH and NO3 radicals and O3, Chemical Physics Letters, 490, 29–33, doi:10.1016/j.cplett.2010.03.023, 2010.

Warnatz, J.: Rate Coefficients in the C/H/O System, in: Combustion Chemistry, Gardiner, W. C. Ed., Springer US, New York, NY, 197–360, 1984.

Williams, D. C., O'Rji, L. N., and Stone, D. A.: Kinetics of the reactions of OH radicals with selected acetates and other esters under simulated atmospheric conditions, Int. J. Chem. Kinet., 25, 539–548, doi:10.1002/kin.550250704, 1993.

Witte, F., Urbanik, E., and C, Z.: Temperature dependence of the rate constants for the addition of hydroxyl to benzene and to some monosubstituted aromatics aniline, bromobenzene, and nitrobenzene and the unimolecular decay of the adducts. Part 2. Kinetics into a quasi-equilibrium, J. Phys. Chem., 90, 3251–3259, doi:10.1021/j100405a040, 1986.

Xing, J.-H., Ono, M., Kuroda, A., Obi, K., Sato, K., and Imamura, T.: Kinetic study of the daytime atmospheric fate of Z-3-hexenal, The journal of physical chemistry. A, 116, 8523–8529, doi:10.1021/jp303202h, 2012.

Yeung, L. Y. and Elrod, M. J.: Experimental and Computational Study of the Kinetics of OH + Pyridine and Its Methyl- and Ethyl-Substituted Derivatives, J. Phys. Chem. A, 107, 4470–4477, doi:10.1021/jp027389s, 2003.

Zhou, S., Barnes, I., Zhu, T., Bejan, I., and Benter, T.: Kinetic study of the gas-phase reactions of OH and NO3 radicals and O3 with selected vinyl ethers, J. Phys. Chem. A, 110, 7386–7392, doi:10.1021/jp061431s, 2006.

Zhou, S., Barnes, I., Zhu, T., and Benter, T.: Kinetic study of gas-phase reactions of OH and NO3 radicals and O3 with iso-butyl and tert-butyl vinyl ethers, The journal of physical chemistry. A, 116, 8885–8892, doi:10.1021/jp305992a, 2012.