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} [cm^3 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	

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