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Temperature-dependent rate coefficients for the reactions of OH radicals with selected alkanes, aromatic compounds, and monoterpenes

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Table S1. OH reaction rates of methane measured in this study.

canister A		canister B	
T / K	k / 10^{-14}cm^{3}s^{-1}	T / K	k / 10^{-14}cm^{3}s^{-1}
340.3 ± 0.6	1.40 ± 0.07	340.7 ± 0.6	1.32 ± 0.06
331.1 ± 0.5	1.12 ± 0.05	331.4 ± 0.5	1.14 ± 0.05
321.7 ± 0.5	0.99 ± 0.05	322.0 ± 0.5	0.96 ± 0.04
312.4 ± 0.4	0.83 ± 0.04	312.5 ± 0.4	0.84 ± 0.04
303.1 ± 0.4	0.73 ± 0.03	303.2 ± 0.4	0.71 ± 0.03
293.8 ± 0.5	0.62 ± 0.03	293.8 ± 0.4	0.60 ± 0.03
286.0 ± 0.6	0.50 ± 0.02	284.4 ± 0.5	0.48 ± 0.03

Table S2. OH reaction rates of ethane measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-13}cm^{3}s^{-1}	T / K	k / 10^{-13}cm^{3}s^{-1}	T / K	k / 10^{-13}cm^{3}s^{-1}
340.2 ± 0.6	3.85 ± 0.14	340.4 ± 0.5	3.84 ± 0.08	340.4 ± 0.6	3.73 ± 0.07
331.0 ± 0.5	3.66 ± 0.21	331.0 ± 0.5	3.44 ± 0.11	331.2 ± 0.5	3.41 ± 0.12
321.7 ± 0.4	3.22 ± 0.15	321.7 ± 0.4	3.14 ± 0.09	321.8 ± 0.4	3.21 ± 0.12
312.4 ± 0.4	3.07 ± 0.15	312.3 ± 0.4	2.85 ± 0.13	312.4 ± 0.4	2.94 ± 0.08
		303.0 ± 0.4	2.62 ± 0.11	303.1 ± 0.4	2.65 ± 0.06
		293.7 ± 0.5	2.31 ± 0.06	293.7 ± 0.4	2.36 ± 0.04
		284.4 ± 0.6	2.06 ± 0.05	284.6 ± 0.5	2.09 ± 0.06

Table S3. OH reaction rates of propane measured in this study. Propane was sampled from the same canister in all measurements.

series A		series B		series C	
T / K	k / 10^{-12}cm^{3}s^{-1}	T / K	k / 10^{-12}cm^{3}s^{-1}	T / K	k / 10^{-12}cm^{3}s^{-1}
340.4 ± 0.7	1.46 ± 0.05	339.9 ± 0.7	1.45 ± 0.04	340.2 ± 0.6	1.52 ± 0.07
331.2 ± 0.5	1.35 ± 0.04	321.4 ± 0.4	1.26 ± 0.03	331.0 ± 0.4	1.39 ± 0.07
				321.7 ± 0.4	1.30 ± 0.07
312.2 ± 0.4	1.19 ± 0.03			312.4 ± 0.4	1.22 ± 0.06
		302.8 ± 0.5	1.12 ± 0.03	303.1 ± 0.4	1.16 ± 0.06
				293.7 ± 0.5	1.08 ± 0.06
				284.8 ± 0.5	1.01 ± 0.06
series D		series E			
T / K	k / 10^{-12}cm^{3}s^{-1}	T / K	k / 10^{-12}cm^{3}s^{-1}		
340.4 ± 0.6	1.45 ± 0.03	340.4 ± 0.6	1.47 ± 0.05		
321.8 ± 0.4	1.29 ± 0.04	321.7 ± 0.4	1.33 ± 0.05		
303.0 ± 0.4	1.16 ± 0.04	303.0 ± 0.4	1.17 ± 0.03		
284.7 ± 0.6	0.99 ± 0.04	284.4 ± 0.6	0.98 ± 0.04		

Table S4. OH reaction rates of n-butane measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-12}cm^{3}s^{-1}	T / K	k / 10^{-12}cm^{3}s^{-1}	T / K	k / 10^{-12}cm^{3}s^{-1}
340.1 ± 0.7	2.82 ± 0.11	340.3 ± 0.6	2.98 ± 0.08	340.5 ± 0.6	3.17 ± 0.08
331.1 ± 0.6	2.84 ± 0.07	331.2 ± 0.5	2.88 ± 0.08	331.3 ± 0.4	2.98 ± 0.12
321.9 ± 0.5	2.71 ± 0.06	321.8 ± 0.4	2.80 ± 0.06	322.0 ± 0.4	3.08 ± 0.14
312.5 ± 0.4	2.60 ± 0.07	312.5 ± 0.4	2.67 ± 0.07	312.6 ± 0.4	2.78 ± 0.11
303.1 ± 0.4	2.55 ± 0.05	303.1 ± 0.4	2.60 ± 0.05	303.2 ± 0.4	2.58 ± 0.09
293.9 ± 0.5	2.43 ± 0.04	293.7 ± 0.5	2.52 ± 0.06	293.8 ± 0.4	2.56 ± 0.14
285.3 ± 0.6	2.29 ± 0.05	284.5 ± 0.5	2.33 ± 0.06		

Table S5. OH reaction rates of methyl vinyl ketone (MVK) measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}
340.6 ± 0.5	1.51 ± 0.03	340.4 ± 0.5	1.58 ± 0.04	340.5 ± 0.5	1.53 ± 0.04
331.3 ± 0.5	1.62 ± 0.04	331.3 ± 0.5	1.69 ± 0.04	331.3 ± 0.5	1.67 ± 0.05
321.9 ± 0.4	1.72 ± 0.05	321.8 ± 0.4	1.80 ± 0.04	321.9 ± 0.4	1.78 ± 0.04
312.5 ± 0.4	1.84 ± 0.05	312.5 ± 0.4	1.93 ± 0.05	312.5 ± 0.4	1.91 ± 0.06
303.1 ± 0.4	1.99 ± 0.04	303.1 ± 0.4	2.05 ± 0.05	303.1 ± 0.4	1.98 ± 0.04
293.8 ± 0.5	2.15 ± 0.05	293.8 ± 0.4	2.26 ± 0.06	293.8 ± 0.5	2.21 ± 0.05
285.2 ± 0.5	2.21 ± 0.11	284.5 ± 0.5	2.35 ± 0.06	284.7 ± 0.5	2.42 ± 0.06

Table S6. OH reaction rates of myrcene measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-10}cm^{3}s^{-1}	T / K	k / 10^{-10}cm^{3}s^{-1}	T / K	k / 10^{-10}cm^{3}s^{-1}
340.5 ± 0.6	1.14 ± 0.04	340.6 ± 0.5	1.20 ± 0.02	340.7 ± 0.5	1.17 ± 0.03
331.3 ± 0.4	1.25 ± 0.03	331.3 ± 0.4	1.32 ± 0.03	331.4 ± 0.4	1.33 ± 0.04
321.9 ± 0.4	1.40 ± 0.03	322.0 ± 0.4	1.46 ± 0.07	322.1 ± 0.4	1.42 ± 0.06
312.6 ± 0.4	1.53 ± 0.04	312.6 ± 0.4	1.57 ± 0.04	312.8 ± 0.4	1.51 ± 0.05
303.1 ± 0.4	1.64 ± 0.04	303.3 ± 0.4	1.62 ± 0.05	303.3 ± 0.4	1.68 ± 0.07
293.8 ± 0.5	1.77 ± 0.03	293.9 ± 0.5	1.76 ± 0.06	293.9 ± 0.5	1.73 ± 0.04
284.5 ± 0.6	1.99 ± 0.06	284.8 ± 0.5	1.92 ± 0.07	285.4 ± 0.5	1.88 ± 0.07

Table S7. OH reaction rates of Δ^3-carene measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}
340.8 ± 0.6	7.3 ± 0.3	340.6 ± 0.5	7.53 ± 0.17	340.6 ± 0.6	7.65 ± 0.13
331.4 ± 0.5	7.25 ± 0.14	331.2 ± 0.5	7.33 ± 0.13	331.3 ± 0.5	7.54 ± 0.17
322.0 ± 0.4	7.43 ± 0.17	321.9 ± 0.4	7.76 ± 0.15	321.9 ± 0.4	7.6 ± 0.3
312.6 ± 0.4	7.55 ± 0.14	312.5 ± 0.4	8.02 ± 0.16	312.5 ± 0.4	8.1 ± 0.3
303.3 ± 0.4	7.79 ± 0.15	303.1 ± 0.4	8.29 ± 0.17	303.2 ± 0.4	8.2 ± 0.2
293.9 ± 0.4	8.29 ± 0.16	293.9 ± 0.4	8.7 ± 0.3	293.8 ± 0.4	8.69 ± 0.16
284.5 ± 0.5	8.5 ± 0.3	284.4 ± 0.5	9.3 ± 0.3	284.5 ± 0.5	9.0 ± 0.6

Table S8. OH reaction rates of γ-terpinene measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-10}cm^{3}s^{-1}	T / K	k / 10^{-10}cm^{3}s^{-1}	T / K	k / 10^{-10}cm^{3}s^{-1}
340.5 ± 0.5	1.06 ± 0.02	340.5 ± 0.5	1.06 ± 0.03	340.4 ± 0.5	1.10 ± 0.03
331.2 ± 0.4	1.21 ± 0.03	331.1 ± 0.4	1.22 ± 0.03	331.2 ± 0.5	1.25 ± 0.03
321.9 ± 0.4	1.34 ± 0.04	321.8 ± 0.4	1.29 ± 0.04	321.9 ± 0.4	1.36 ± 0.03
312.5 ± 0.4	1.42 ± 0.03	312.5 ± 0.4	1.45 ± 0.03	312.4 ± 0.4	1.48 ± 0.05
303.1 ± 0.4	1.61 ± 0.03	303.1 ± 0.4	1.51 ± 0.03	303.1 ± 0.4	1.56 ± 0.04
293.9 ± 0.4	1.68 ± 0.03	293.7 ± 0.5	1.65 ± 0.03	293.8 ± 0.4	1.67 ± 0.04
284.6 ± 0.5	1.77 ± 0.05	284.5 ± 0.5	1.97 ± 0.05	284.5 ± 0.5	1.86 ± 0.05

Table S9. OH reaction rates of toluene measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-12}cm^{3}s^{-1}	T / K	k / 10^{-12}cm^{3}s^{-1}	T / K	k / 10^{-12}cm^{3}s^{-1}
340.5 ± 0.5	4.73 ± 0.11	340.4 ± 0.5	4.62 ± 0.15	340.5 ± 0.5	4.77 ± 0.11
331.1 ± 0.5	5.13 ± 0.13	331.2 ± 0.5	5.03 ± 0.10	331.2 ± 0.5	5.12 ± 0.16
321.8 ± 0.4	5.36 ± 0.12	321.8 ± 0.4	5.54 ± 0.18	321.9 ± 0.4	5.44 ± 0.14
312.4 ± 0.4	5.58 ± 0.15	312.5 ± 0.4	5.77 ± 0.20	312.6 ± 0.4	5.63 ± 0.24
303.2 ± 0.4	5.77 ± 0.09	303.2 ± 0.4	6.09 ± 0.18	303.2 ± 0.4	5.87 ± 0.14
293.9 ± 0.4	6.01 ± 0.11	293.8 ± 0.4	6.11 ± 0.31	293.8 ± 0.4	6.01 ± 0.14
284.5 ± 0.5	6.14 ± 0.11	284.5 ± 0.5	6.08 ± 0.23	285.5 ± 0.5	5.90 ± 0.18

Table S10. OH reaction rates of mesitylene measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}
340.6 ± 0.5	3.99 ± 0.08	340.5 ± 0.5	4.03 ± 0.08	340.5 ± 0.6	4.06 ± 0.12
331.1 ± 0.4	4.35 ± 0.09	331.2 ± 0.4	4.48 ± 0.09	331.3 ± 0.4	4.56 ± 0.09
321.8 ± 0.4	4.92 ± 0.13	321.8 ± 0.4	4.85 ± 0.10	321.9 ± 0.4	4.98 ± 0.11
312.5 ± 0.4	5.25 ± 0.11	312.4 ± 0.4	5.28 ± 0.12	312.5 ± 0.4	5.37 ± 0.13
303.1 ± 0.4	5.57 ± 0.17	303.2 ± 0.4	5.69 ± 0.10	303.1 ± 0.4	5.77 ± 0.10
293.8 ± 0.4	6.41 ± 0.16	293.9 ± 0.4	6.17 ± 0.15	293.8 ± 0.4	6.27 ± 0.14
284.5 ± 0.5	6.64 ± 0.12	284.6 ± 0.5	6.63 ± 0.13	284.6 ± 0.5	6.65 ± 0.17

Table S11. OH reaction rates of m-xylene measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}
340.5 ± 0.5	1.66 ± 0.04	340.4 ± 0.5	1.72 ± 0.06	340.6 ± 0.5	1.70 ± 0.06
331.2 ± 0.5	1.80 ± 0.05	331.3 ± 0.4	1.92 ± 0.05	331.5 ± 0.4	1.94 ± 0.06
321.8 ± 0.4	2.01 ± 0.05	321.9 ± 0.4	2.05 ± 0.05	322.2 ± 0.4	2.03 ± 0.08
312.5 ± 0.4	2.16 ± 0.06	312.5 ± 0.4	2.22 ± 0.05	312.8 ± 0.4	2.22 ± 0.09
303.1 ± 0.4	2.41 ± 0.06	303.2 ± 0.4	2.37 ± 0.06	303.2 ± 0.4	2.30 ± 0.06
293.9 ± 0.5	2.62 ± 0.07	293.9 ± 0.4	2.60 ± 0.04	294.1 ± 0.4	2.56 ± 0.07
285.0 ± 0.5	2.79 ± 0.11	285.0 ± 0.6	2.72 ± 0.07		

Table S12. OH reaction rates of o-xylene measured in this study.

canister A		canister B		canister C	
T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}	T / K	k / 10^{-11}cm^{3}s^{-1}
340.5 ± 0.5	1.05 ± 0.03	340.6 ± 0.6	1.06 ± 0.03	340.6 ± 0.6	1.03 ± 0.03
331.3 ± 0.4	1.13 ± 0.04	331.3 ± 0.5	1.13 ± 0.03		
321.9 ± 0.4	1.22 ± 0.04	321.9 ± 0.4	1.22 ± 0.03	322.1 ± 0.4	1.16 ± 0.03
312.5 ± 0.4	1.28 ± 0.03	312.6 ± 0.4	1.28 ± 0.04	312.7 ± 0.4	1.29 ± 0.04
303.1 ± 0.4	1.34 ± 0.03	303.2 ± 0.4	1.34 ± 0.03	303.4 ± 0.4	1.31 ± 0.04
293.8 ± 0.4	1.43 ± 0.03	293.9 ± 0.4	1.43 ± 0.03	294.0 ± 0.5	1.40 ± 0.04
285.1 ± 0.5	1.44 ± 0.05	285.6 ± 0.5	1.43 ± 0.05	286.2 ± 0.5	1.41 ± 0.06