Supplementary:Material

Rate coefficients for the reactions of OH radical with C3-C11 alkanes determined by the relative rate technique

Yanyan Xin [1,2], Xiaoxiu Lun [1], Shuyang Xie [2], Junfeng Liu [2], Chengtang Liu [2]*, Yujing Mu [2]

[1] Beijing Forestry University, Beijing, 100083, China

[2] Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, 100085, China.

*Correspondence to: Chengtang Liu (ctliu@rcees.ac.cn).

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Table S1. Initial conditions of the various species injected into the reactor.

Alkanes	H_2O_2	N_2/Air	PAMs
10 ppb	100 ul	250 L	2.5 L

Table S2. Rate constants for OH + Alkanes in N_2 and Air at 273-323 K.

T (K)	$K_{OH+n\text{-}Hexane}$ (cm^3 $molecule^{-1}$ s^{-1})	Slope[a]	K_{OH}[b] (cm^3 $molecule^{-1}$ s^{-1})	Bath gas
		2,3-Dimethylbutane		
273	4.17×10^{-12}	1.224±0.005	$(5.10\pm0.05)\times10^{-12}$	Air
		1.220	5.09×10^{-12}	N_2
283	4.44×10^{-12}	1.201±0.008	$(5.33\pm0.07)\times10^{-12}$	Air
		1.187	5.27×10^{-12}	N_2
293	4.70×10^{-12}	1.181±0.009	$(5.55\pm0.09)\times10^{-12}$	Air
		1.146	5.39×10^{-12}	N_2
303	4.97×10^{-12}	1.126±0.004	$(5.60\pm0.04)\times10^{-12}$	Air
		1.134	5.64×10^{-12}	N_2
313	5.22×10^{-12}	1.091±0.001	$(5.70\pm0.01)\times10^{-12}$	Air
		1.088	5.68×10^{-12}	N_2
323	5.48×10^{-12}	1.061±0.001	$(5.82\pm0.01)\times10^{-12}$	Air
		1.052	5.76×10^{-12}	N_2
		Methylcyclopentane		
273	4.17×10^{-12}	1.544±0.006	$(6.44\pm0.03)\times10^{-12}$	Air
		1.515	6.32×10^{-12}	N_2
283	4.44×10^{-12}	1.447±0.040	$(6.43\pm0.18)\times10^{-12}$	Air
		1.478	6.56×10^{-12}	N_2
293	4.70×10^{-12}	1.417±0.016	$(6.66\pm0.08)\times10^{-12}$	Air
		1.448	6.80×10^{-12}	N_2
303	4.97×10^{-12}	1.398±0.014	$(6.95\pm0.07)\times10^{-12}$	Air
		1.430	7.11×10^{-12}	N_2
313	5.22×10^{-12}	1.388±0.002	$(7.24\pm0.01)\times10^{-12}$	Air
		1.359	7.09×10^{-12}	N_2
323	5.48×10^{-12}	1.337±0.010	$(7.33\pm0.05)\times10^{-12}$	Air
		1.334	7.31×10^{-12}	N_2
		n-Heptane		
273	4.17×10^{-12}	1.287±0.040	$(5.37\pm0.17)\times10^{-12}$	Air
		1.288	5.37×10^{-12}	N_2

283	4. 44×10^{-12}	1.308±0.020	(5.81±0.09)×10^{-12}	Air
		1.340	5.95×10^{-12}	N_2
293	4.70×10^{-12}	1.311±0.049	(6.16±0.23)×10^{-12}	Air
		1.318	6.19×10^{-12}	N_2
303	4.97×10^{-12}	1.323±0.011	(6.58±0.06)×10^{-12}	Air
		1.312	6.52×10^{-12}	N_2
313	5.22×10^{-12}	1.359±0.005	(7.09±0.01)×10^{-12}	Air
		1.275	6.66×10^{-12}	N_2
323	5.48×10^{-12}	1.318±0.005	(7.22±0.03)×10^{-12}	Air
		1.264	6.93×10^{-12}	N_2
		3-Methylheptane		
273	4.17×10^{-12}	1.584±0.018	(6.61±0.07)×10^{-12}	Air
		1.616	6.74×10^{-12}	N_2
283	4. 44×10^{-12}	1.591±0.003	(7.06±0.02)×10^{-12}	Air
		1.643	7.29×10^{-12}	N_2
293	4.70×10^{-12}	1.612±0.076	(7.58±0.36)×10^{-12}	Air
		1.630	7.66×10^{-12}	N_2
303	4.97×10^{-12}	1.595±0.047	(7.93±0.24)×10^{-12}	Air
		1.639	8.14×10^{-12}	N_2
313	5.22×10^{-12}	1.598±0.072	(8.34±0.38)×10^{-12}	Air
		1.558	8.13×10^{-12}	N_2
323	5.48×10^{-12}	1.550±0.001	(8.49±0.01)×10^{-12}	Air
		1.526	8.36×10^{-12}	N_2
		n-Octane		
273	4.17×10^{-12}	1.637±0.075	(6.83±0.31)×10^{-12}	Air
		1.607	6.70×10^{-12}	N_2
283	4. 44×10^{-12}	1.642±0.007	(7.29±0.03)×10^{-12}	Air
		1.716	7.62×10^{-12}	N_2
293	4.70×10^{-12}	1.617±0.020	7.60±0.10)×10^{-12}	Air
		1.655	7.78×10^{-12}	N_2
303	4.97×10^{-12}	1.643±0.009	(8.17±0.04)×10^{-12}	Air
		1.687	8.38×10^{-12}	N_2
313	5.22×10^{-12}	1.689±0.041	(8.82±0.22)×10^{-12}	Air
		1.666	8.70×10^{-12}	N_2
323	5.48×10^{-12}	1.625±0.053	(5.90±0.29)×10^{-12}	Air
		1.633	8.95×10^{-12}	N_2
		Propane		
273	4.17×10^{-12}	0.170	7.09×10^{-13}	Air
		0.167	6.97×10^{-13}	N_2
283	4.44×10^{-12}	0.181±0.041	8.97×10^{-13}	Air
		0.197	8.75×10^{-13}	N_2
293	4.70×10^{-12}	0.215±0.027	(1.01±0.13)×10^{-12}	Air

		0.195	9.14×10^{-13}	N_2
303	4.97×10^{-12}	0.199±0.013	$(9.91\pm0.63)\times10^{-13}$	Air
		0.208	1.04×10^{-12}	N_2
313	5.22×10^{-12}	0.220±0.010	$(1.15\pm0.05)\times10^{-12}$	Air
		0.214	1.12×10^{-12}	N_2
323	5.48×10^{-12}	0.223±0.051	$(1.22\pm0.28)\times10^{-12}$	Air
		0.224	1.23×10^{-12}	N_2
		Isobutane		
273	4.17×10^{-12}	0.350±0.033	$(1.46\pm0.14)\times10^{-12}$	Air
		0.338	1.41×10^{-12}	N_2
283	4.44×10^{-12}	0.400±0.020	$(1.78\pm0.09)\times10^{-12}$	Air
		0.378	1.68×10^{-12}	N_2
293	4.70×10^{-12}	0.389±0.024	$(1.83\pm0.11)\times10^{-12}$	Air
		0.394	1.85×10^{-12}	N_2
303	4.97×10^{-12}	0.416±0.054	$(2.07\pm0.27)\times10^{-12}$	Air
		0.421	2.09×10^{-12}	N_2
313	5.22×10^{-12}	0.398±0.025	$(2.08\pm0.13)\times10^{-12}$	Air
		0.415	2.17×10^{-12}	N_2
323	5.48×10^{-12}	0.424±0.009	$(2.32\pm0.05)\times10^{-12}$	Air
		0.428	2.34×10^{-12}	N_2
		n-Butane		
273	4.17×10^{-12}	0.316±0.140	$(1.32\pm0.58)\times10^{-12}$	Air
		0.224	9.34×10^{-13}	N_2
283	4.44×10^{-12}	0.389±0.068	$(1.73\pm0.30)\times10^{-12}$	Air
		0.418	1.86×10^{-12}	N_2
293	4.70×10^{-12}	0.408±0.004	$(1.92\pm0.02)\times10^{-12}$	Air
		0.436	2.05×10^{-12}	N_2
303	4.97×10^{-12}	0.449±0.031	$(2.23\pm0.15)\times10^{-12}$	Air
		0.470	2.34×10^{-12}	N_2
313	5.22×10^{-12}	0.455±0.027	$(2.37\pm0.15)\times10^{-12}$	Air
		0.481	2.51×10^{-12}	N_2
323	5.48×10^{-12}	0.468±0.024	$(2.57\pm0.13)\times10^{-12}$	Air
		0.489	2.68×10^{-12}	N_2
		Isopentane		
273	4.17×10^{-12}	0.676±0.006	$(2.82\pm0.03)\times10^{-12}$	Air
		0.686	2.86×10^{-12}	N_2
283	4.44×10^{-12}	0.693±0.058	$(3.08\pm0.26)\times10^{-12}$	Air
		0.679	3.01×10^{-12}	N_2
293	4.70×10^{-12}	0.694±0.057	$(3.26\pm0.27)\times10^{-12}$	Air
		0.707	3.32×10^{-12}	N_2
303	4.97×10^{-12}	0.683±0.086	$(3.39\pm0.43)\times10^{-12}$	Air
		0.656	3.26×10^{-12}	N_2
313	5.22×10^{-12}	0.681±0.016	$(3.56\pm0.08)\times10^{-12}$	Air

		0.664	3.47×10^{-12}	N_2
323	5.48×10^{-12}	0.664±0.050	$(3.64\pm0.27)\times10^{-12}$	Air
		0.654	3.58×10^{-12}	N_2
		n-pentane		
273	4.17×10^{-12}	0.687±0.020	$(2.86\pm0.08)\times10^{-12}$	Air
		0.651	2.71×10^{-12}	N_2
283	4.44×10^{-12}	0.681±0.001	$(3.02\pm0.03)\times10^{-12}$	Air
		0.658	2.92×10^{-12}	N_2
293	4.70×10^{-12}	0.664±0.051	$(3.12\pm0.24)\times10^{-12}$	Air
		0.670	3.15×10^{-12}	N_2
303	4.97×10^{-12}	0.655±0.078	$(3.25\pm0.39)\times10^{-12}$	Air
		0.675	3.36×10^{-12}	N_2
313	5.22×10^{-12}	0.641±0.058	$(3.35\pm0.30)\times10^{-12}$	Air
		0.668	3.49×10^{-12}	N_2
323	5.48×10^{-12}	0.623±0.017	$(3.41\pm0.09)\times10^{-12}$	Air
		0.653	3.58×10^{-12}	N_2
		Cyclopentane		
273	4.17×10^{-12}	0.898±0.049	$(3.75\pm0.20)\times10^{-12}$	Air
		0.878	3.66×10^{-12}	N_2
283	4.44×10^{-12}	0.918±0.006	$(4.08\pm0.03)\times10^{-12}$	Air
		0.933	4.14×10^{-12}	N_2
293	4.70×10^{-12}	0.972±0.021	$(4.57\pm0.10)\times10^{-12}$	Air
		0.948	4.45×10^{-12}	N_2
303	4.97×10^{-12}	0.949±0.001	$(4.72\pm0.01)\times10^{-12}$	Air
		0.950	4.72×10^{-12}	N_2
313	5.22×10^{-12}	0.993±0.007	$(5.18\pm0.04)\times10^{-12}$	Air
		0.943	4.92×10^{-12}	N_2
323	5.48×10^{-12}	0.959±0.003	$(5.26\pm0.02)\times10^{-12}$	Air
		0.961	5.27×10^{-12}	N_2
		2,2-Dimethylbutane		
273	4.17×10^{-12}	0.299±0.010	$(1.25\pm0.01)\times10^{-12}$	Air
		0.299	1.25×10^{-12}	N_2
283	4.44×10^{-12}	0.329±0.023	$(1.46\pm0.10)\times10^{-12}$	Air
		0.337	1.49×10^{-12}	N_2
293	4.70×10^{-12}	0.371±0.004	$(1.74\pm0.02)\times10^{-12}$	Air
		0.346	1.63×10^{-12}	N_2
303	4.97×10^{-12}	0.372±0.028	$(1.85\pm0.14)\times10^{-12}$	Air
		0.387	1.92×10^{-12}	N_2
313	5.22×10^{-12}	0.389±0.009	$(2.03\pm0.05)\times10^{-12}$	Air
		0.394	2.06×10^{-12}	N_2
323	5.48×10^{-12}	0.376±0.009	$(2.06\pm0.05)\times10^{-12}$	Air
		0.38826	2.17×10^{-12}	N_2
		2-Methylpentane		

273	4.17×10^{-12}	0.938±0.002	$(3.91\pm0.01)\times10^{-12}$	Air
		0.924	3.85×10^{-12}	N_2
283	4.44×10^{-12}	0.962±0.031	$(4.17\pm0.14)\times10^{-12}$	Air
		0.951	4.22×10^{-12}	N_2
293	4.70×10^{-12}	0.982±0.002	$(4.62\pm0.01)\times10^{-12}$	Air
		0.961	4.52×10^{-12}	N_2
303	4.97×10^{-12}	0.954±0.002	$(4.74\pm0.01)\times10^{-12}$	Air
		0.964	4.79×10^{-12}	N_2
313	5.22×10^{-12}	0.957±0.028	$(5.00\pm0.15)\times10^{-12}$	Air
		0.929	4.85×10^{-12}	N_2
323	5.48×10^{-12}	0.943±0.001	$(5.17\pm0.01)\times10^{-12}$	Air
		0.932	5.11×10^{-12}	N_2
		3-Methylpentane		
273	4.17×10^{-12}	0.882±0.016	$(3.68\pm0.07)\times10^{-12}$	Air
		0.908	3.79×10^{-12}	N_2
283	4.44×10^{-12}	0.908±0.017	$(4.03\pm0.08)\times10^{-12}$	Air
		0.967	4.30×10^{-12}	N_2
293	4.70×10^{-12}	0.921±0.056	$(4.33\pm0.26)\times10^{-12}$	Air
		0.951	4.47×10^{-12}	N_2
303	4.97×10^{-12}	0.928±0.035	$(4.61\pm0.17)\times10^{-12}$	Air
		0.983	4.88×10^{-12}	N_2
313	5.22×10^{-12}	0.886±0.073	$(4.63\pm0.38)\times10^{-12}$	Air
		0.940	4.91×10^{-12}	N_2
323	5.48×10^{-12}	0.914±0.010	$(5.01\pm0.06)\times10^{-12}$	Air
		0.927	5.08×10^{-12}	N_2
		2,4-Dimethylpentane		
273	4.17×10^{-12}	0.921±0.008	$(3.84\pm0.04)\times10^{-12}$	Air
		0.922	3.84×10^{-12}	N_2
283	4.44×10^{-12}	0.928±0.032	$(4.12\pm0.14)\times10^{-12}$	Air
		0.943	4.19×10^{-12}	N_2
293	4.70×10^{-12}	0.932±0.028	$(4.38\pm0.13)\times10^{-12}$	Air
		0.946	4.45×10^{-12}	N_2
303	4.97×10^{-12}	0.924±0.011	$(4.59\pm0.06)\times10^{-12}$	Air
		0.929	4.62×10^{-12}	N_2
313	5.22×10^{-12}	0.927±0.024	$(4.84\pm0.12)\times10^{-12}$	Air
		0.898	4.69×10^{-12}	N_2
323	5.48×10^{-12}	0.901±0.011	$(4.94\pm0.06)\times10^{-12}$	Air
		0.878	4.81×10^{-12}	N_2
		Cyclohexane		
273	4.17×10^{-12}	1.252±0.044	$(5.22\pm0.18)\times10^{-12}$	Air
		1.260	5.25×10^{-12}	N_2
283	4.44×10^{-12}	1.310±0.033	$(5.82\pm0.15)\times10^{-12}$	Air
		1.379	6.12×10^{-12}	N_2

293	4.70×10^{-12}	1.307±0.036	$(6.14\pm0.17)\times10^{-12}$	Air
		1.354	6.36×10^{-12}	N_2
303	4.97×10^{-12}	1.310±0.050	$(6.51\pm0.25)\times10^{-12}$	Air
		1.261	6.21×10^{-12}	N_2
313	5.22×10^{-12}	1.332±0.047	$(6.96\pm0.25)\times10^{-12}$	Air
		1.243	6.49×10^{-12}	N_2
323	5.48×10^{-12}	1.276±0.008	$(6.99\pm0.05)\times10^{-12}$	Air
		1.118	6.13×10^{-12}	N_2
		2-Methylhexane		
273	4.17×10^{-12}	1.365±0.001	$(5.69\pm0.01)\times10^{-12}$	Air
		1.372	5.72×10^{-12}	N_2
283	4.44×10^{-12}	1.347±0.046	$(5.98\pm0.20\times10^{-12}$	Air
		1.327	5.89×10^{-12}	N_2
293	4.70×10^{-12}	1.303±0.035	$(6.12\pm0.16)\times10^{-12}$	Air
		1.280	6.02×10^{-12}	N_2
303	4.97×10^{-12}	1.263±0.012	$(6.28\pm0.06)\times10^{-12}$	Air
		1.250	6.21×10^{-12}	N_2
313	5.22×10^{-12}	1.222±0.030	$(6.38\pm0.16)\times10^{-12}$	Air
		1.212	6.33×10^{-12}	N_2
323	5.48×10^{-12}	1.184±0.029	$(6.49\pm0.16)\times10^{-12}$	Air
		1.170	6.41×10^{-12}	N_2
		3-Methylhexane		
273	4.17×10^{-12}	0746±0.028	$(3.11\pm0.12)\times10^{-12}$	Air
		0.875	3.65×10^{-12}	N_2
283	4.44×10^{-12}	0.811±0.172	$(3.60\pm0.76)\times10^{-12}$	Air
		0.868	3.85×10^{-12}	N_2
293	4.70×10^{-12}	0.702±0.014	$(3.30\pm0.07)\times10^{-12}$	Air
		0.722	3.39×10^{-12}	N_2
303	4.97×10^{-12}	0.701±0.153	$(3.48\pm0.76)\times10^{-12}$	Air
		0.715	$3.143.55\times10^{-12}$	N_2
313	5.22×10^{-12}	0.787±0.160	$(4.11\pm0.08)\times10^{-12}$	Air
		0.726	4.79×10^{-12}	N_2
323	5.48×10^{-12}	0.824±0.107	$(4.52\pm0.06)\times10^{-12}$	Air
		0.738	4.05×10^{-12}	N_2
		2,2,4-Trimethylpentane		
273	4.17×10^{-12}	0.611±0.001	$(2.55\pm0.01)\times10^{-12}$	Air
		0.629	2.62×10^{-12}	N_2
283	4.44×10^{-12}	0.634±0.022	$(2.81\pm0.10)\times10^{-12}$	Air
		0.633	2.81×10^{-12}	N_2
293	4.70×10^{-12}	0.625±0.006	$(2.94\pm0.03)\times10^{-12}$	Air
		0.632	2.97×10^{-12}	N_2
303	4.97×10^{-12}	0.638±0.024	$(3.17\pm0.12)\times10^{-12}$	Air
		0.632	3.14×10^{-12}	N_2

313	5.22×10^{-12}	0.633±0.030	$(3.30\pm0.16)\times10^{-12}$	Air
		0.614	3.20×10^{-12}	N_2
323	5.48×10^{-12}	0.616±0.008	$(3.38\pm0.04)\times10^{-12}$	Air
		0.608	3.33×10^{-12}	N_2
		Methylcyclohexane		
273	4.17×10^{-12}	1.806±0.005	$(7.53\pm0.26)\times10^{-12}$	Air
		1.860	7.76×10^{-12}	N_2
283	4.44×10^{-12}	1.873±0.018	$(8.31\pm0.08)\times10^{-12}$	Air
		1.883	8.36×10^{-12}	N_2
293	4.70×10^{-12}	1.869±0.017	$(8.77\pm0.06)\times10^{-12}$	Air
		1.835	8.62×10^{-12}	N_2
303	4.97×10^{-12}	1.848±0.001	$(9.18\pm0.01)\times10^{-12}$	Air
		1.833	9.11×10^{-12}	N_2
313	5.22×10^{-12}	1.859±0.019	$(9.70\pm0.10)\times10^{-12}$	Air
		1.793	9.36×10^{-12}	N_2
323	5.48×10^{-12}	1.804±0.022	$(9.89\pm0.12)\times10^{-12}$	Air
		1.742	9.55×10^{-12}	N_2
		2,3,4-Trimethylpentane		
273	4.17×10^{-12}	1.522±0.023	$(6.35\pm0.09)\times10^{-12}$	Air
		1.527	6.37×10^{-12}	N_2
283	4.44×10^{-12}	1.477±0.034	$(6.56\pm0.15)\times10^{-12}$	Air
		1.502	6.67×10^{-12}	N_2
293	4.70×10^{-12}	1.435±0.022	$(6.74\pm0.11)\times10^{-12}$	Air
		1.439	6.76×10^{-12}	N_2
303	4.97×10^{-12}	1.377±0.014	$(6.84\pm0.07)\times10^{-12}$	Air
		1.379	6.85×10^{-12}	N_2
313	5.22×10^{-12}	1.355±0.017	$(7.07\pm0.09)\times10^{-12}$	Air
		1.333	6.96×10^{-12}	N_2
323	5.48×10^{-12}	1.296±0.019	$(7.10\pm0.10)\times10^{-12}$	Air
		1.297	7.11×10^{-12}	N_2
		2-Methylheptane		
273	4.17×10^{-12}	1.586±0.188	$(6.61\pm0.78)\times10^{-12}$	Air
		1.654	6.90×10^{-12}	N_2
283	4.44×10^{-12}	1.499±0.016	$(6.66\pm0.07)\times10^{-12}$	Air
		1.563	6.94×10^{-12}	N_2
293	4.70×10^{-12}	1.332±0.038	$(6.26\pm0.18)\times10^{-12}$	Air
		1.409	6.62×10^{-12}	N_2
303	4.97×10^{-12}	1.344±0.092	$(6.68\pm0.46)\times10^{-12}$	Air
		1.335	6.64×10^{-12}	N_2
313	5.22×10^{-12}	1.396±0.017	$(7.29\pm0.09)\times10^{-12}$	Air
		1.318	6.88×10^{-12}	N_2
323	5.48×10^{-12}	1.339±0.035	$(7.34\pm0.19)\times10^{-12}$	Air
		1.312	7.19×10^{-12}	N_2

		Nonane		
273	4.17×10^{-12}	1.882±0.008	$(7.85\pm0.04)\times10^{-12}$	Air
		2.009	8.38×10^{-12}	N_2
283	4.44×10^{-12}	1.924±0.003	$(8.54\pm0.02)\times10^{-12}$	Air
		1.982	8.80×10^{-12}	N_2
293	4.70×10^{-12}	1.858±0.039	$(8.73\pm0.18)\times10^{-12}$	Air
		1.888	8.87×10^{-12}	N_2
303	4.97×10^{-12}	1.909±0.016	$(9.49\pm0.08)\times10^{-12}$	Air
		1.917	9.53×10^{-12}	N_2
313	5.22×10^{-12}	1.950±0.167	$(1.02\pm0.09)\times10^{-12}$	Air
		1.858	9.70×10^{-12}	N_2
323	5.48×10^{-12}	1.917±0.040	$(1.05\pm0.02)\times10^{-11}$	Air
		1.842	1.01×10^{-11}	N_2
		n-Decane		
273	4.17×10^{-12}	2.483±0.608	$(1.04\pm0.25)\times10^{-11}$	Air
		2.391	9.97×10^{-12}	N_2
283	4.44×10^{-12}	2.237±0.008	$(9.93\pm0.04)\times10^{-12}$	Air
		2.309	1.03×10^{-11}	N_2
293	4.70×10^{-12}	2.225±0.181	$(1.05\pm0.08)\times10^{-11}$	Air
		2.232	1.05×10^{-11}	N_2
303	4.97×10^{-12}	2.206±0.095	$(1.10\pm0.05)\times10^{-11}$	Air
		2.280	1.2132×10^{-11}	N_2
313	5.22×10^{-12}	2.278±0.050	$(1.19\pm0.03)\times10^{-11}$	Air
		2.240	1.17×10^{-11}	N_2
323	5.48×10^{-12}	2.261±0.083	$(1.24\pm0.05\times10^{-11}$	Air
		2.193	1.20×10^{-11}	N_2
		n-Undecane		
273	4.17×10^{-12}	2.426	1.01×10^{-11}	Air
		2.598	1.08×10^{-11}	N_2
283	4.44×10^{-12}	2.425±0.032	$(1.08\pm0.02)\times10^{-11}$	Air
		2.488	1.10×10^{-11}	N_2
293	4.70×10^{-12}	2.287±0.008	$(1.07\pm0.01)\times10^{-11}$	Air
		2.374	1.12×10^{-11}	N_2
303	4.97×10^{-12}	2.288±0.261	$(1.14\pm0.13)\times10^{-11}$	Air
		2.396	1.19×10^{-11}	N_2
313	5.22×10^{-12}	2.456±0.086	$(1.28\pm0.05)\times10^{-11}$	Air
		2.337	1.22×10^{-11}	N_2
323	5.48×10^{-12}	2.446±0.065	$(1.34\pm0.04)\times10^{-11}$	Air
		2.350	1.29×10^{-11}	N_2

[a] [b]The error bar was taken as 2σ.

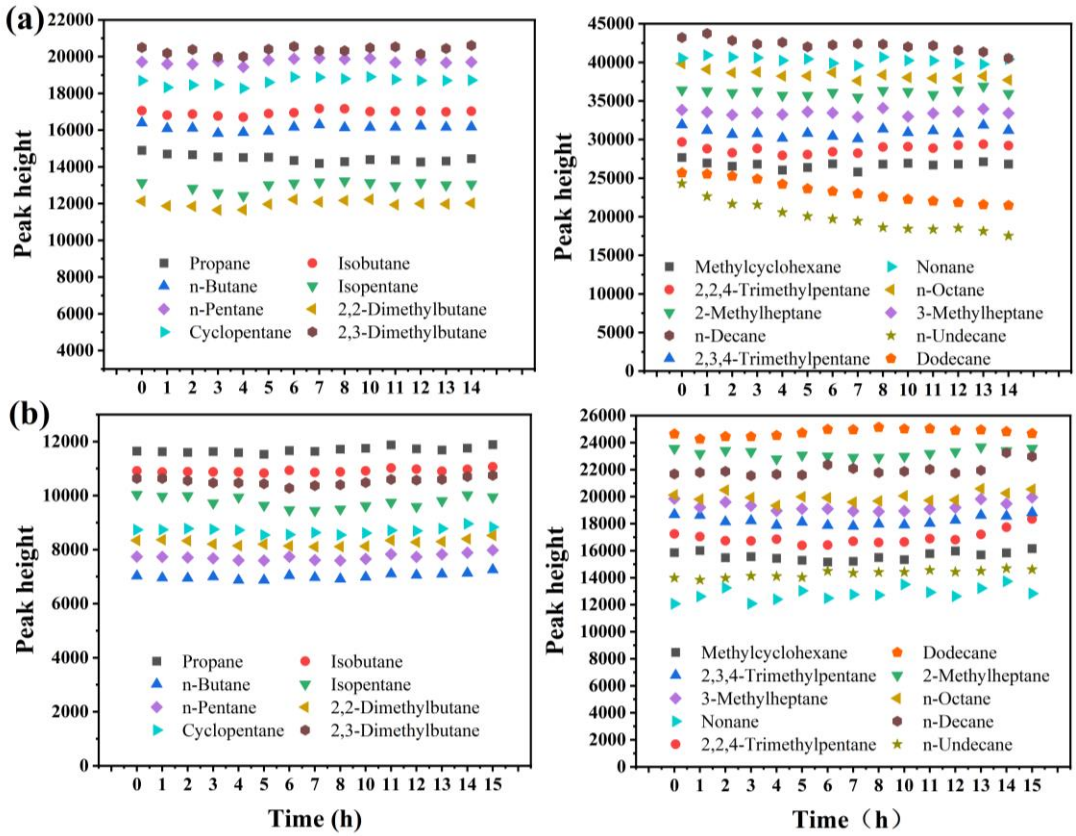

Figure S1. (a) Peak height of C3-C11 alkanes in Alkanes+N_2+dark at 0-14 h. (b) Peak height of C3-C11 alkanes in Alkanes+N_2+H_2O_2+dark at 0-15h. The following data have been displaced for reasons of clarity: a) Propane, Isobutane, n-Butane, Isopentane, 2,2-Dimethylbutane, Methylcyclohexane, 2,2,4-Trimethylpentane, 2,3,4-Trimethylpentane, 2-Methylheptane, 3-Methylheptane, n-Undecane, Ducedane vertically displaced by 8000, 2000, -3000, -6000, -8000, -4000, -4000, -2500, -1000, -4000, -12000, 8000 units, respectively; b) Propane, Isobutane, n-Butane, n-pentane, Cyclopentane, 2,2-Dimethylbutane, 2,3,4-Trimethylpentane, 2-Methylheptane, Nonane, n-Decane, n-Undecane, Ducedane vertically displaced by 8000, 3000, -3000, -2000, -2500, -1000, 1000, 4000, -8000,1000,-1500,17000 units, respectively.

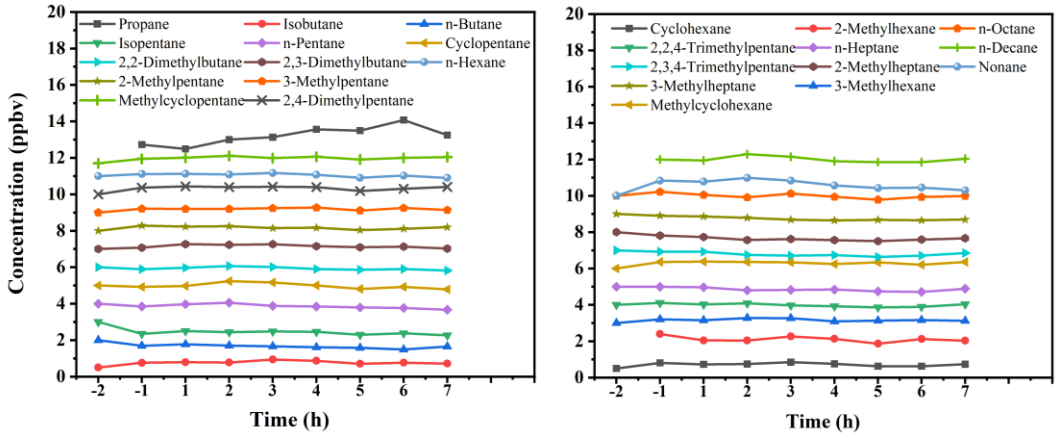

Figure S2. Concentration of C3-C11 alkanes in Alkanes+N_2+UV light at different time. The following data have been displaced for reasons of clarity: Propane, Isobutane, n-Butane, Isopentane, n-pentane, Cyclopentane, 2,2-Dimethylbutane, 2,3-Dimethylbutane, 2-Methylpentane, 3-Methylpentane, n-Hexane, Methylcyclopentane, Cyclohexane, 2-Methylhexane, 3-Methylhexane, 2,2,4-Trimethylpentane, n-Heptane, Methylcyclohexane, 2,3,4-Trimethylpentane, 2-Methylheptane, 3-Methylheptane, n-Decane, vertically displaced by -3, -9.5, -8, -7, -6, -5, -4, -3, -2, -1, 1, 1.7, 9.5, -19, -7, -6, -5, -4, -3, -2, -1, 2 units, respectively. The -2 and -1 of abscissa refer to 2 and 1 hours before turning on the light respectively. 1-7 refers to 1-7 hours after turning on the light respectively.

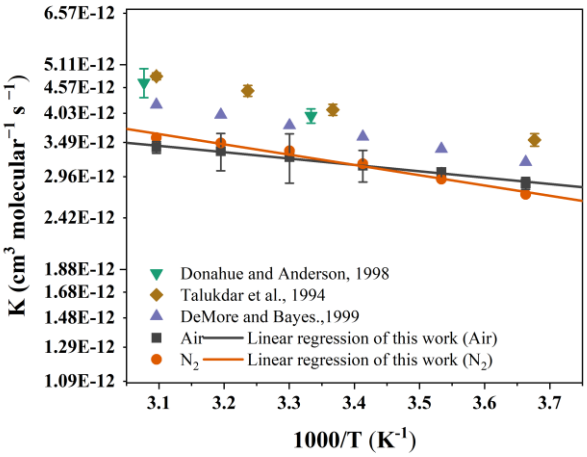

Figure S3. Arrhenius plot for the reaction of n-pentane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

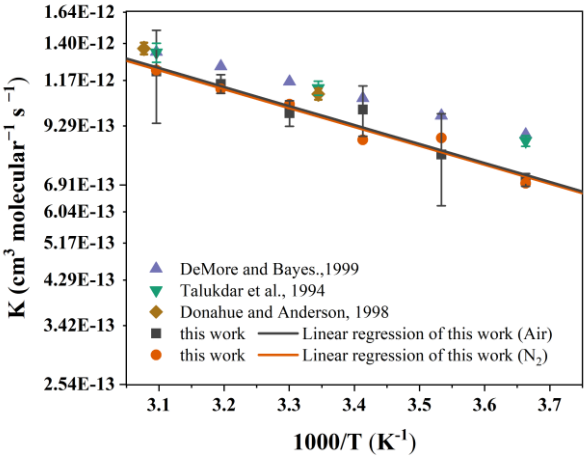

Figure S4. Arrhenius plot for the reaction of propane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

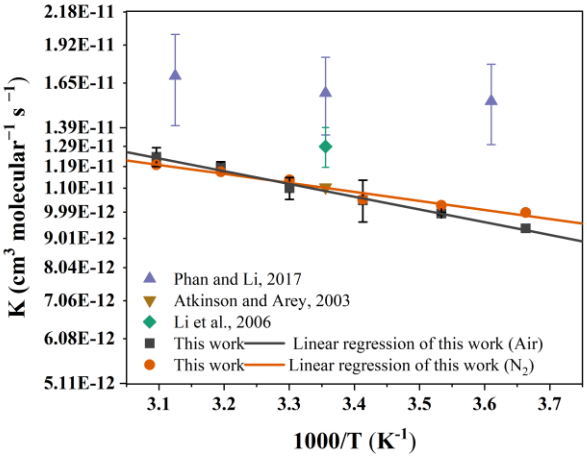

Figure S5. Arrhenius plot for the reaction of methylcyclopentane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

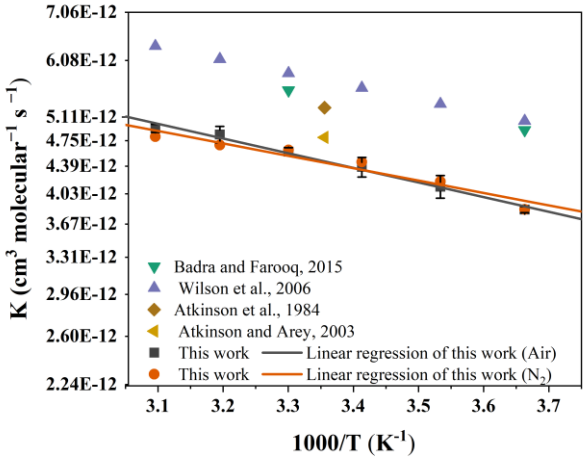

Figure S6. Arrhenius plot for the reaction of 2,4-Dimethylpentane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

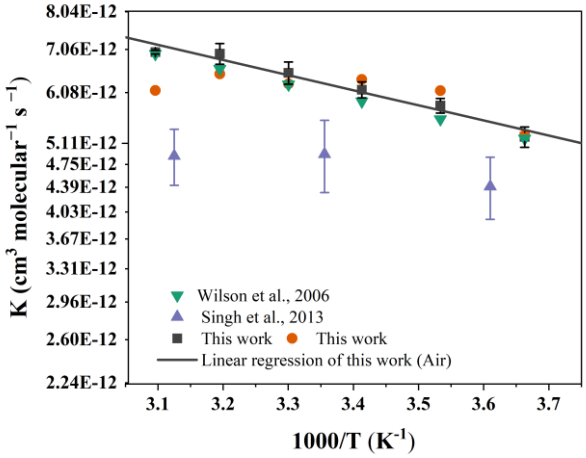

Figure S7. Arrhenius plot for the reaction of cyclohexane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

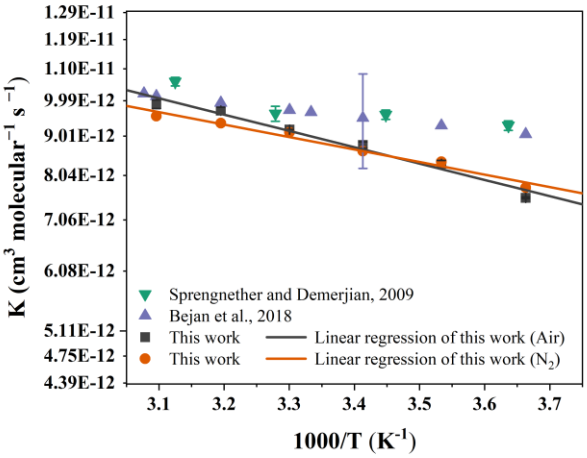

Figure S8. Arrhenius plot for the reaction of methylcyclohexane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

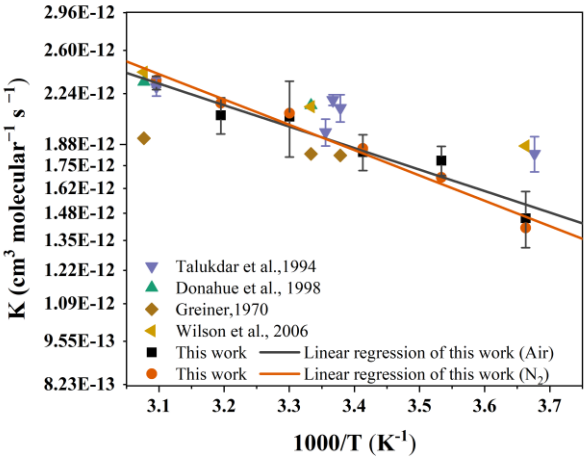

Figure S9. Arrhenius plot for the reaction of Isobutane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

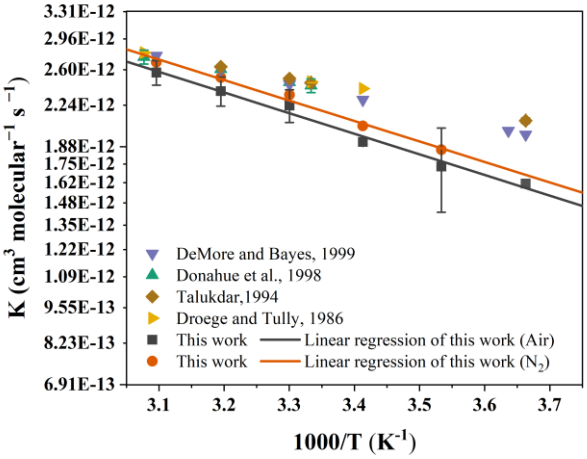

Figure S10. Arrhenius plot for the reaction of n-butane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

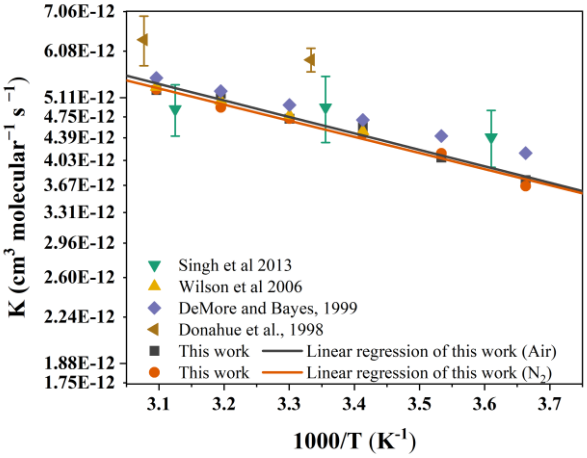

Figure S11. Arrhenius plot for the reaction of Cyclopentane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

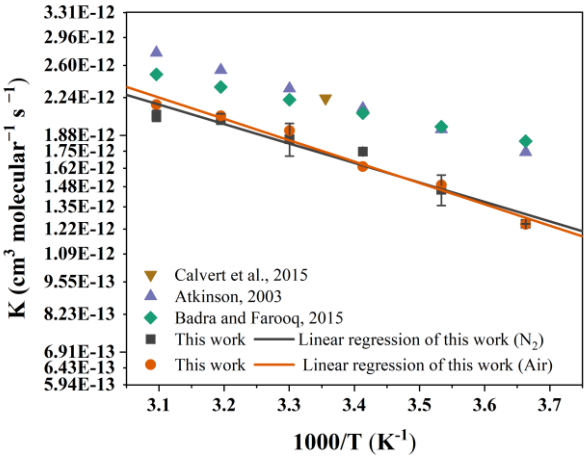

Figure S12. Arrhenius plot for the reaction of 2,2-Dimethylbutane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

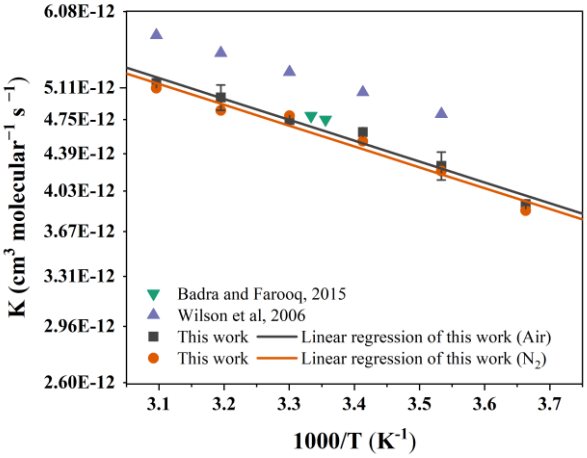

Figure S13. Arrhenius plot for the reaction of 2-Methylpentane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

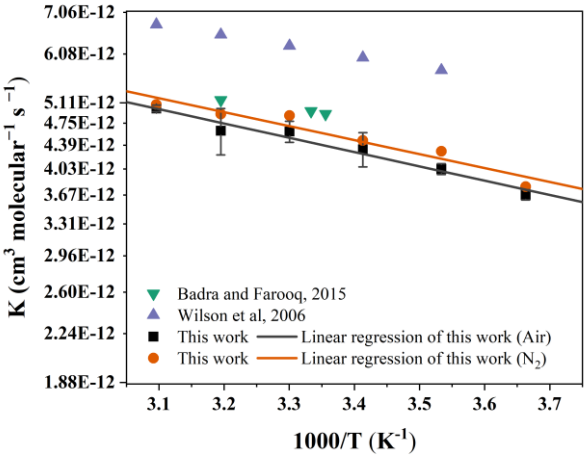

Figure S14. Arrhenius plot for the reaction of 3-Methylpentane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.

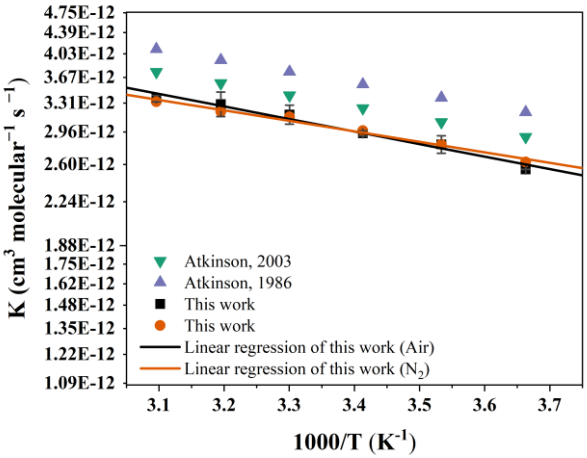

Figure S15. Arrhenius plot for the reaction of 2,2,4-Trimethylpentane with OH at 273-323 K along with available literature data. The error bar was taken as 2σ.