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Characterization of primary and secondary wood combustion products generated under different burner loads

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Table S1. Characterization of primary gas phase and particle phase emissions measured from the smog chamber.

Expt.	Wood burned per chamber air volume (×10^3 kg/m^3)	CO_2 (ppm)*	CO (ppm)*	CH_4 (ppm)*	THC (ppmC)*	NO_x (ppb)*	Total PM (μg/m^3)*	Organic (μg/m^3)[+]*	PAH (μg/m^3)*	BC (μg/m^3)*	NO_3 (μg/m^3)*	SO_4 (μg/m^3)*	NH_4 (μg/m^3)*	Cl (μg/m^3)*
1	0.562±0.008	540±20	21.0±0.4	2.53±0.02	6.7±0.7	153.6±0.8	454±7	395±7	15±1	41.9±0.4	10.2±0.8	3.3±0.1	2.0±0.2	1.16±0.05
2	0.635±0.004	615±8	24.30±0.09	3.90±0.02	7.4±0.4	175.0±0.8	162±3	98±3	3.3±0.5	54.9±0.9	6.2±0.5	1.8±0.1	1.0±0.1	0.38±0.05
3	0.5227±0.0001	515.6±0.2	14.46±0.04	7.65±0.02	2.5±0.1	147.6±0.1	118±5	31±1	1.5±0.3	80±5	5.0±0.3	1.1±0.1	0.79±0.09	0.13±0.04
4	1.239±0.004	1191±9	55.5±0.1	2.931±0.008	16.5±0.3	312.3±0.9	164±3	97±3	16±1	56.5±0.3	6.6±0.4	2.4±0.2	0.72±0.05	0.74±0.07
5	0.669±0.001	649±2	26.82±0.06	1.6362±0.0009	6.2±0.1	160±2	116±1	27±1	3.6±0.3	80.2±0.4	6.9 ±0.4	1.2±0.1	0.8±0.1	0.22±0.05
6	1.6908±0.0003	1600.2±0.6	96.00±0.07	11.919±0.007	26±0.2	360.5±0.9	291±4	99±3	13.7±0.7	177±3	8.4±0.4	4.1±0.3	0.95±0.06	2.0±0.1

[+] Organics includes PAHs.

[*] Deviations are ±2s calculated from the error propagation of the sample standard deviation of the measurements.

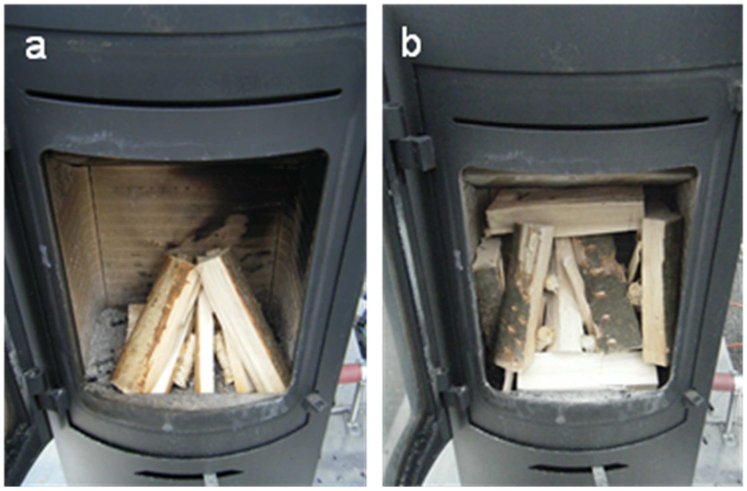

Figure S1. Representative photographs of the loaded wood combustion chamber (lined with vermiculite) before burning for (a) average and (b) high load conditions. Logs were approximately 30 cm in legnth and 10 cm in diameter and firestarters were intersperse among the logs.

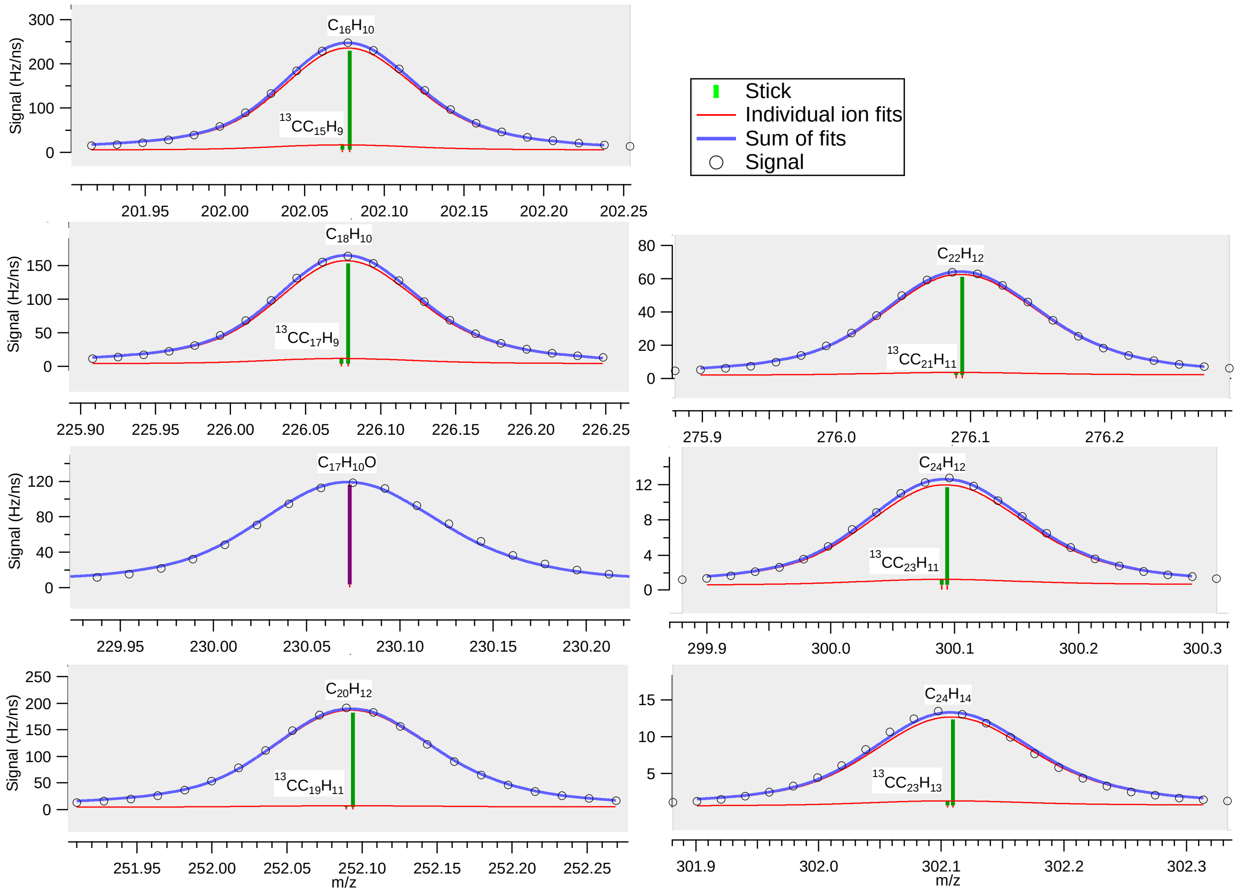

Figure S2. Fits of all parent PAH ions above *m/z* 200 from experiment 4 before aging.

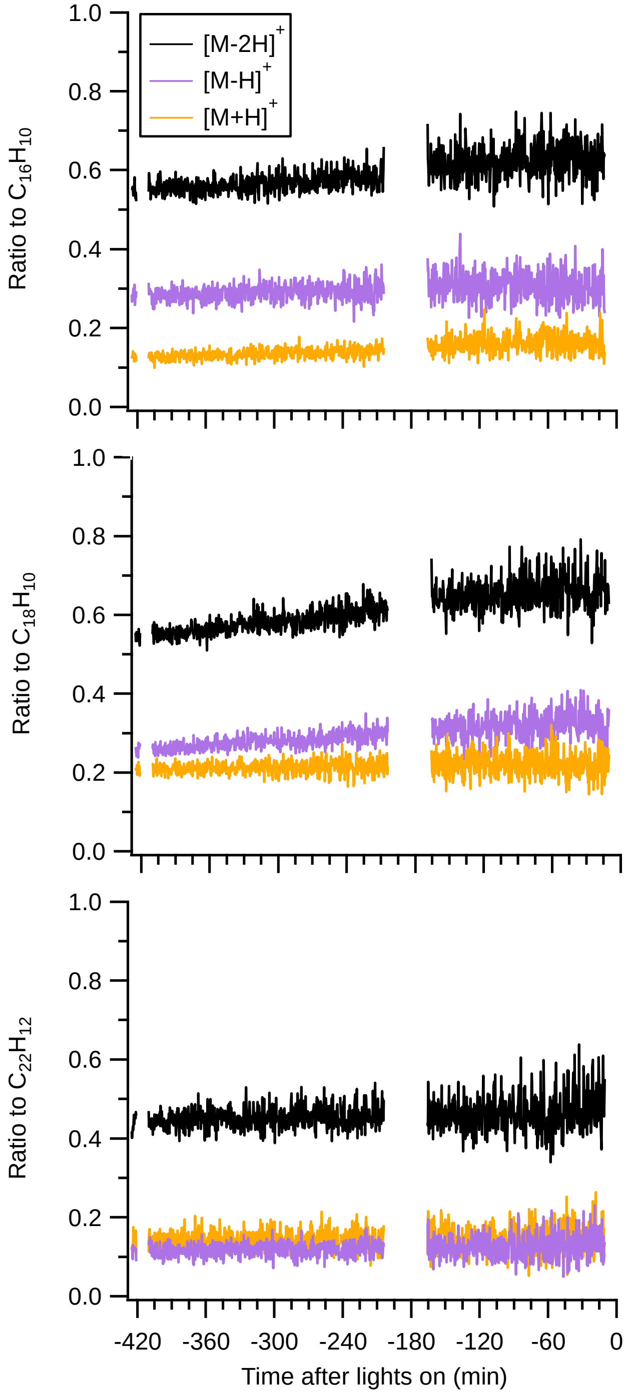

Figure S3. Representative ratios of associated ions to parent ions from primary emissions from experiment 4.

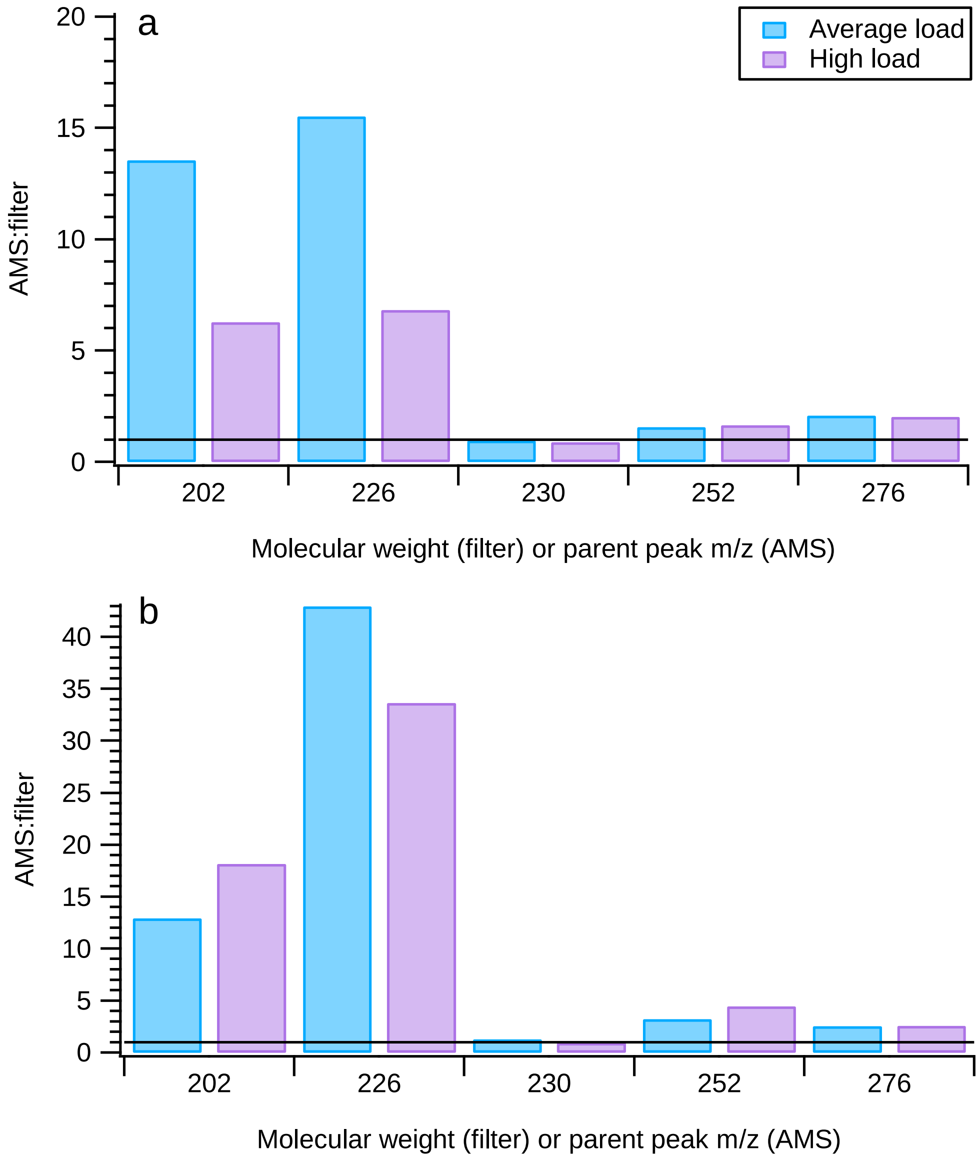

Figure S4. Average ratio of emission factors measured from AMS and filter analysis for emissions before aging (a) and during aging (b) for average and high load experiments. AMS data are the sum of the indicated parent signal and all associated ions. Black line indicates perfect agreement between the two analysis methods.

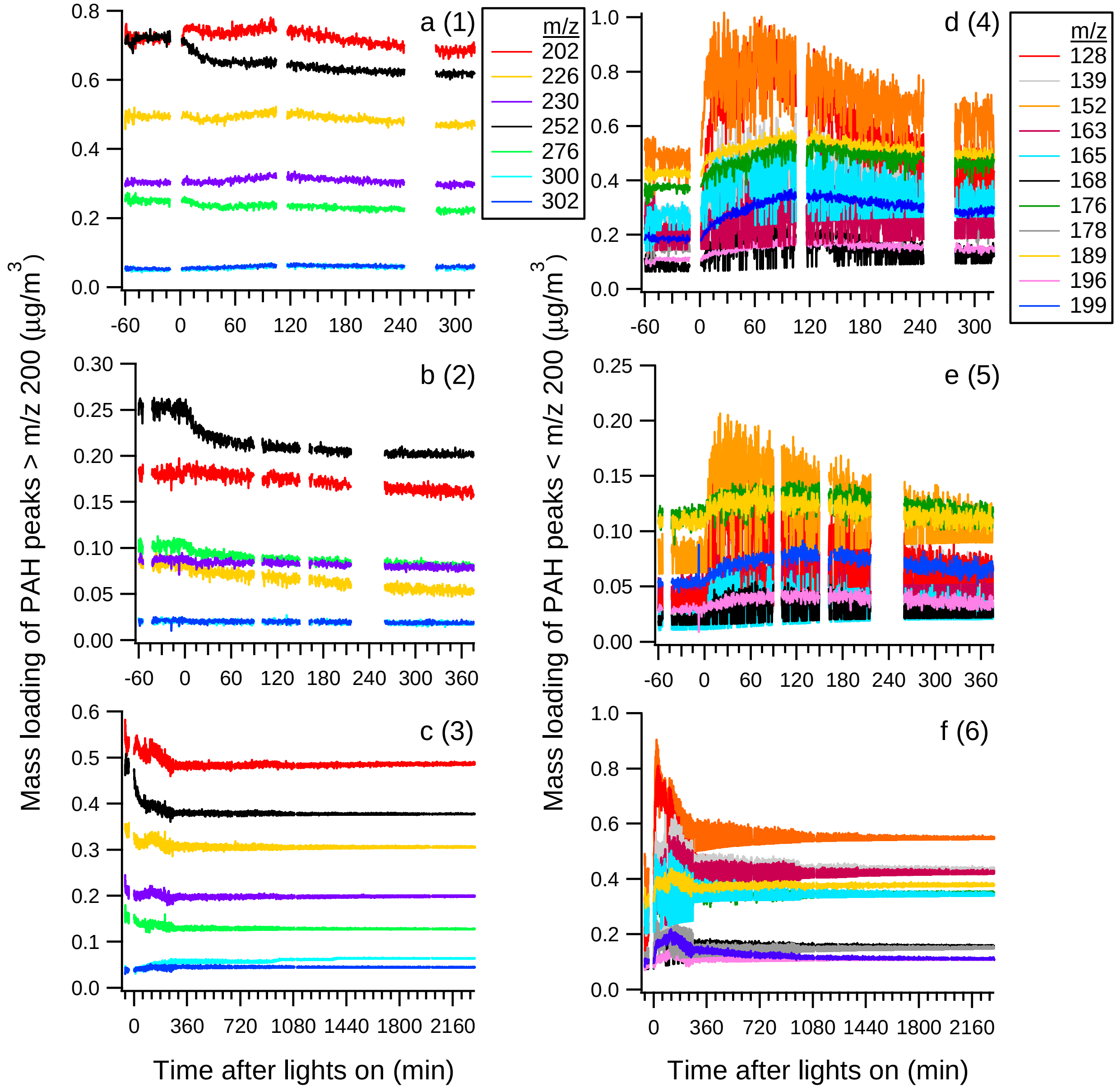

Figure S5. Time traces of individual PAH ions 1 h prior to initiation of photochemistry until the end of the experiment for *m/z*>200 (a-c, experiments 4-6) and *m/z*<200 (d-f, experiments 4-6). Wall losses and dilution have been accounted for.

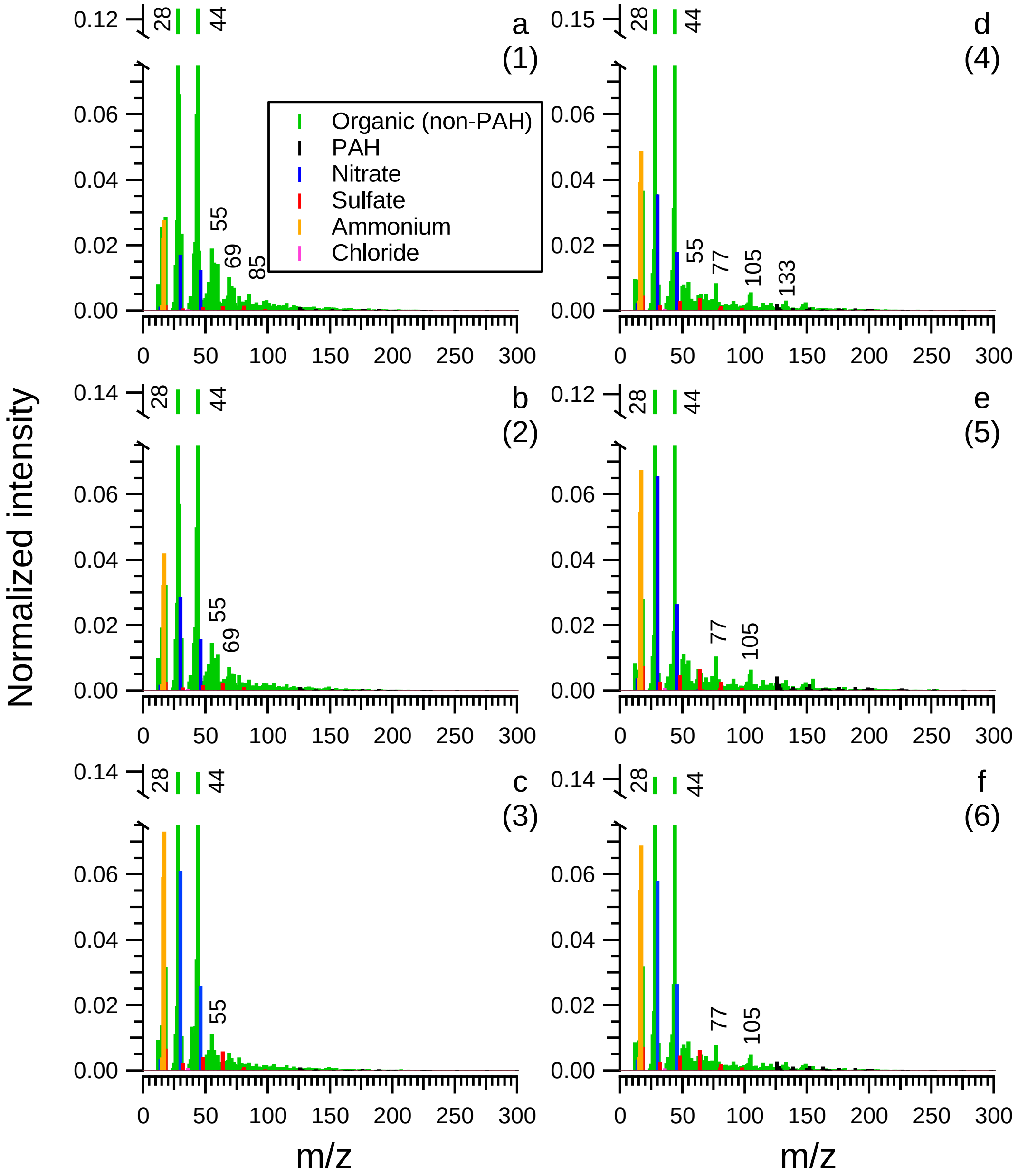

Figure S6. AMS mass spectra for average load experiments (a-c; experiments 1-3) and high load experiments (d-f; experiments 4-6). Mass spectra from experiments 1, 2, 4, 5 correspond to an OH exposure of 1.6×10^{7} molec cm^{-3} h. Experiments 3 and 6 correspond to 3 h of aging. The legend in (a) applies to (a-f).

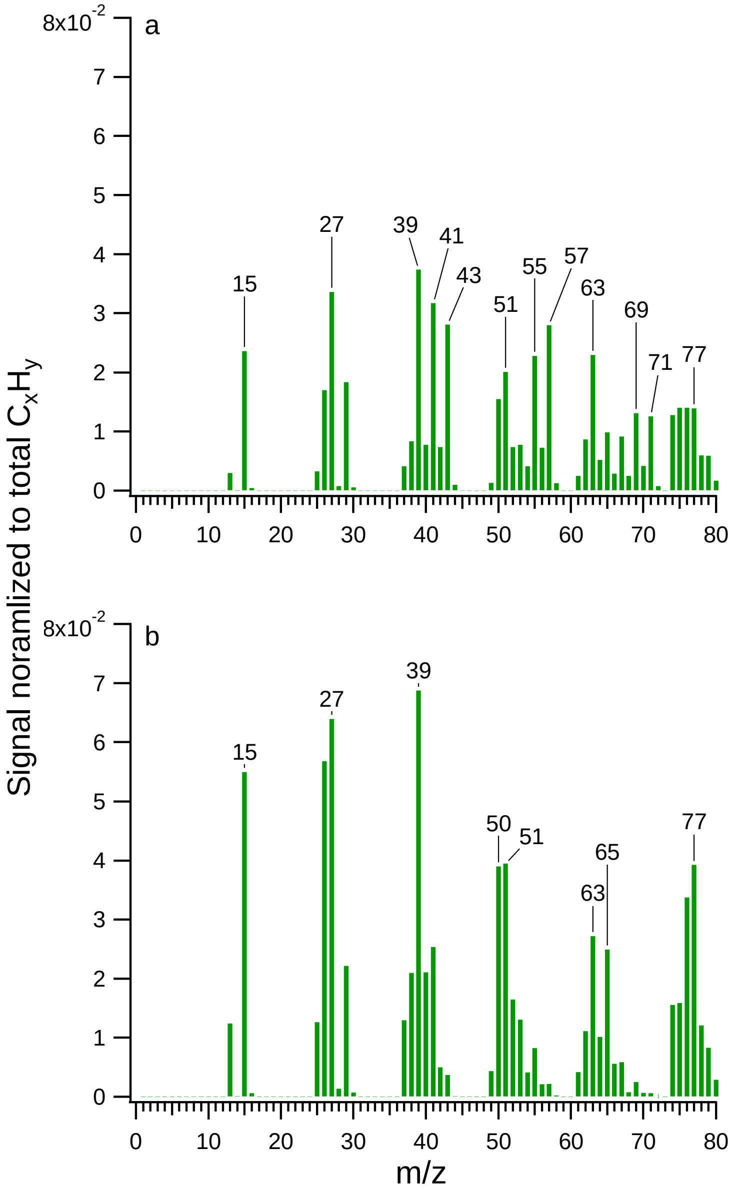

Figure S7. Mass spectrum of C_xH_y fragments ≤*m/*z 80 from experiment 4 for (a) primary emissions and (b) after exposure to 1.6×10^7 molec OH cm^{-3} h.

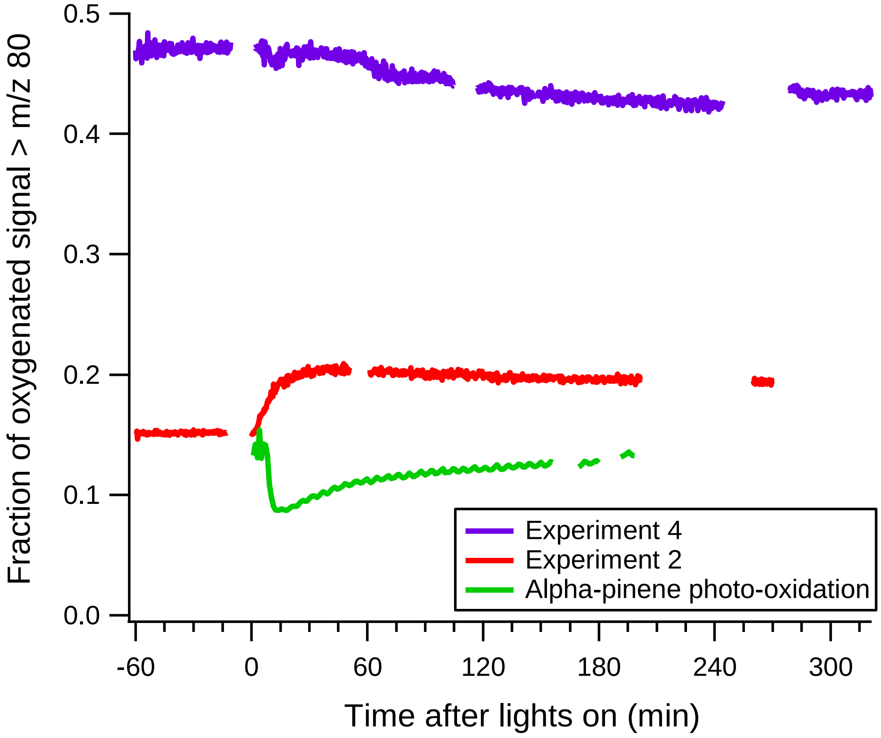

Figure S8. Fraction of the total oxygenated ions ≥*m/z*80 for experiment 2 and 4 (not including $[CO_2]^+$). For comparison, this fraction was also determined during an alpha-pinene photo-oxidation experiment.

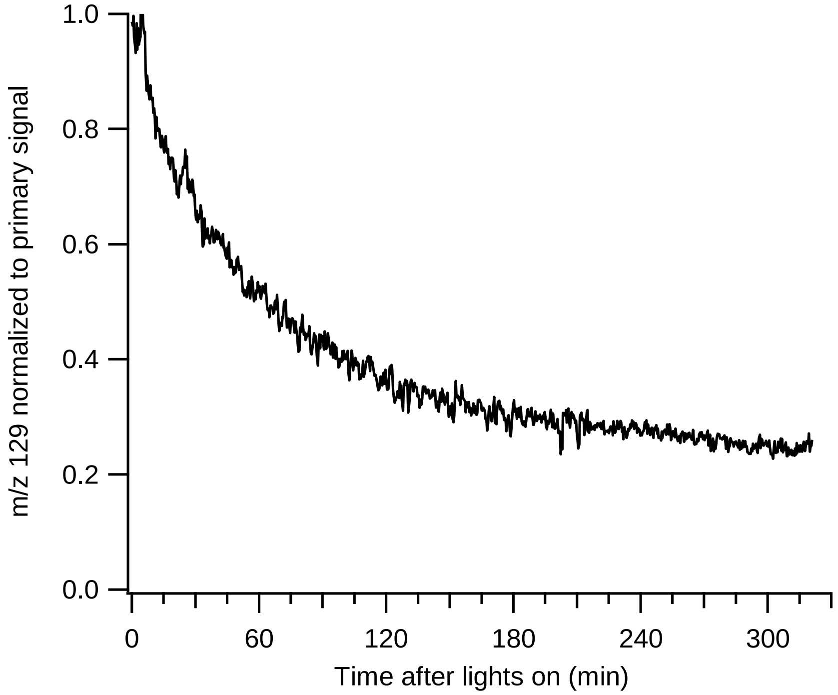

Figure S9. Time trace of gas phase *m/z* 129 normalized to the reagent ion signal (*m/z* 21) and the primary naphthalene signal measured using PTR-MS during experiment 4. Trace has been corrected for dilution during aging.