Supporting Information

Secondary Organic Aerosol Formation from Camphene Oxidation: Measurements and Modeling

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Table S1. Fractions of total peroxy radical reactions of each type, calculated based on SAPRC simulations.

Expt.	$[HC]_0$ (ppb)	$[HC]_0/[NO_x]_0$ (ppbv/ppbv)	SOA Yield	Fraction of total RO_2 Reaction					
				NO	HO_2	RCO_3	RO_2	NO_3	Uni
WO1	7	7	0.15	0.06	0.93	0	0	0	0
WO2	9	9	0.08	0.05	0.95	0	0	0	0
WO3	28	28	0.27	0.04	0.94	0	0	0	0.01
WO4	57	57	0.28	0.05	0.87	0.01	0.03	0	0.05
WO5	120	120	0.27	0.04	0.63	0.03	0.14	0	0.16
WO6	223	223	0.19	0.03	0.52	0.04	0.21	0	0.20
W1	7	0.08	0.36	0.93	0.07	0	0	0	0
W2	25	0.18	0.33	0.96	0.04	0	0	0	0
W3	32	0.51	0.64	0.89	0.11	0	0	0	0
W4	43	5.91	0.41	0.49	0.47	0.01	0	0	0.03
W5	60	0.64	0.60	0.90	0.10	0	0	0	0
W6	131	1.33	0.59	0.80	0.16	0.01	0	0	0.02
W7	172	2.88	0.52	0.65	0.23	0.04	0	0	0.08

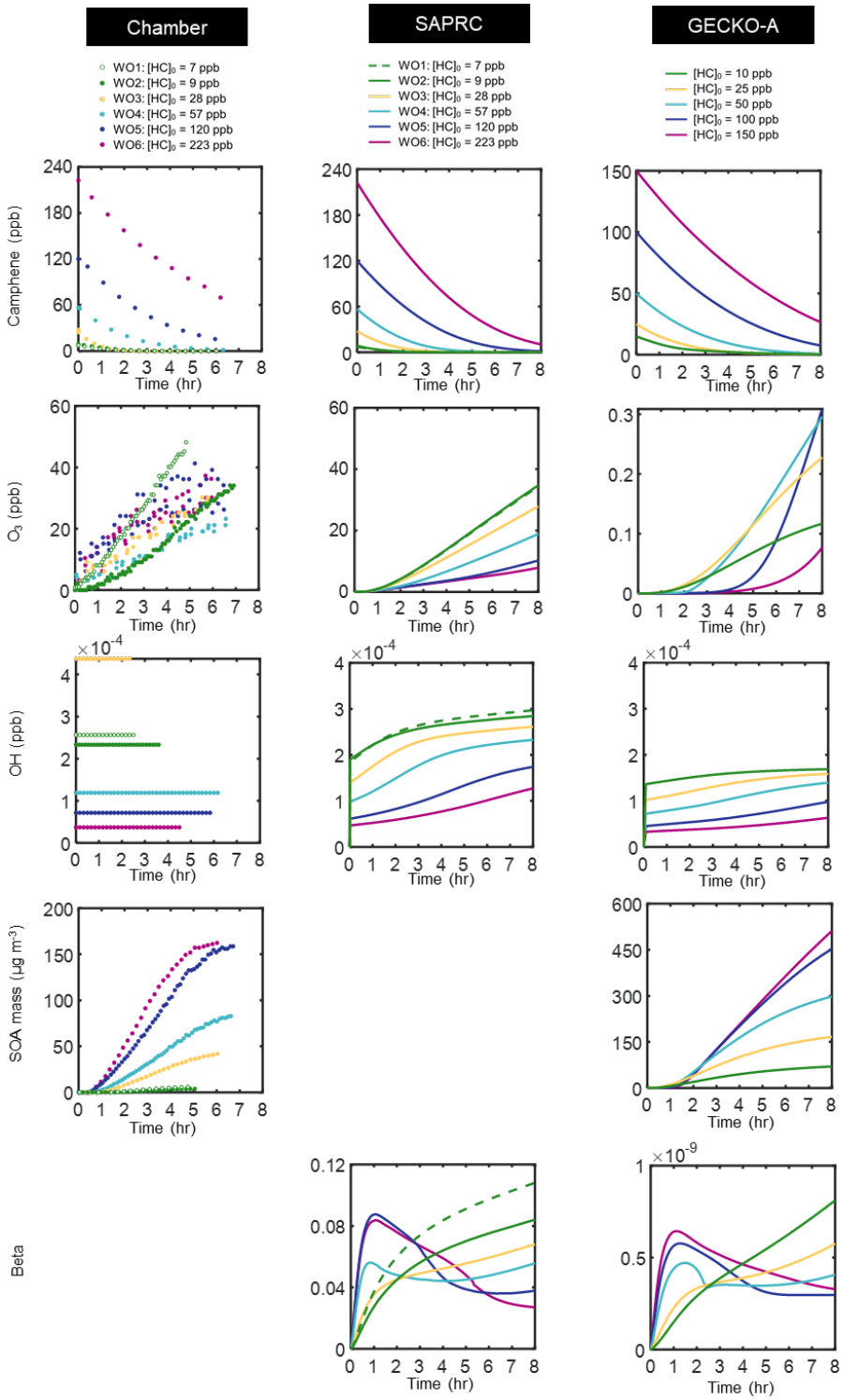


Figure S1. Comparison of the chamber data (dots) and model simulation results (lines) for the photo-oxidation of camphene without added NO_x. Two blank figures were due to measurement and modeling limitation. Experimental OH mixing ratio was calculated as:

$[OH]_{exp} = \frac{\frac{d[Cam]_{exp}}{dt} - k_{Cam,O_3}[Cam]_{exp}[O_3] - k_{Cam,NO_3}[Cam]_{exp}[NO_3]_{exp}}{k_{Cam,OH}[Cam]_{exp}}$, by assuming $[NO_3]_{exp} \approx [NO_3]_{sim}$; the chamber $[OH]$ curves showing in the figure were averaged either throughout the experiment or until complete consumption of camphene.

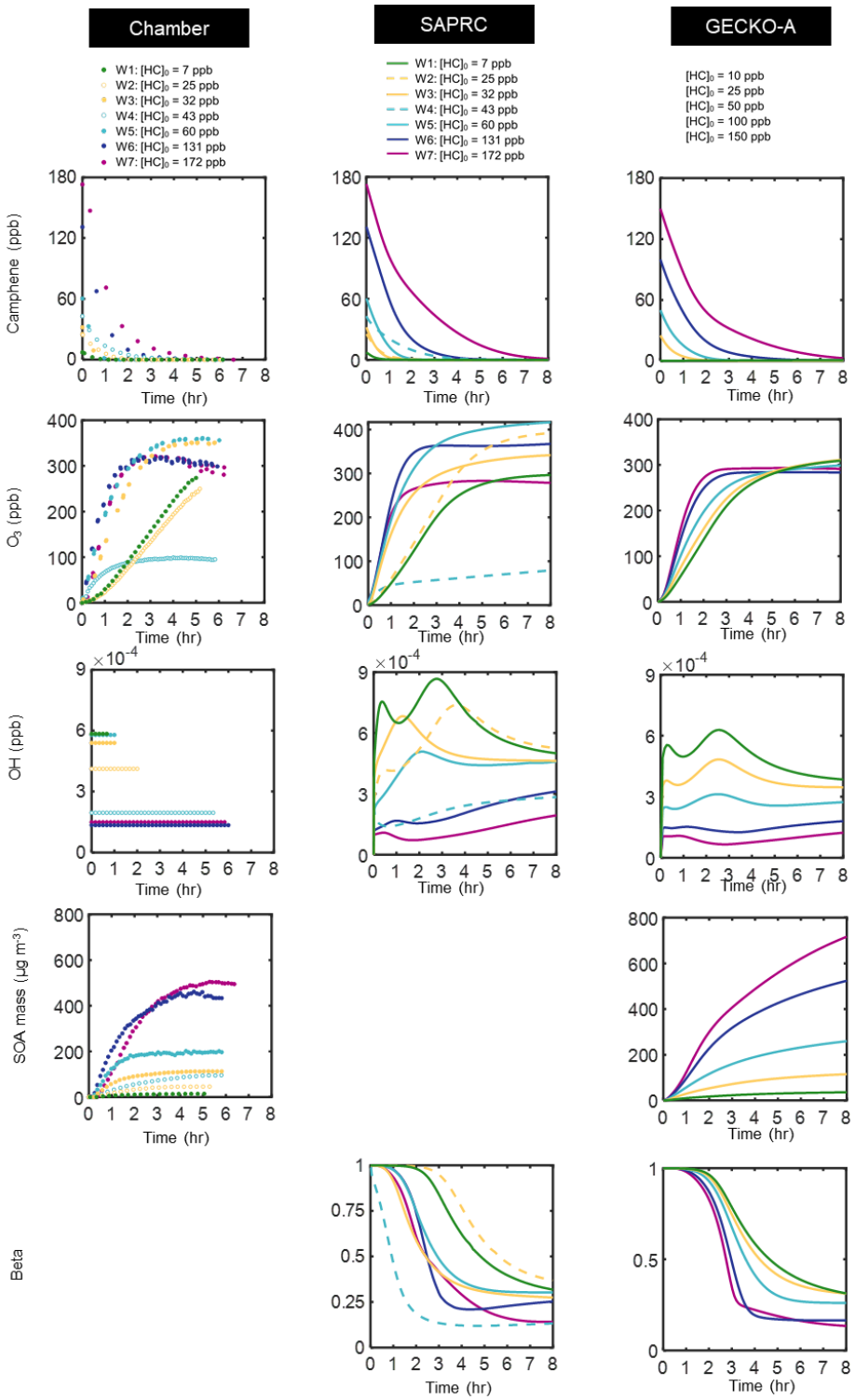
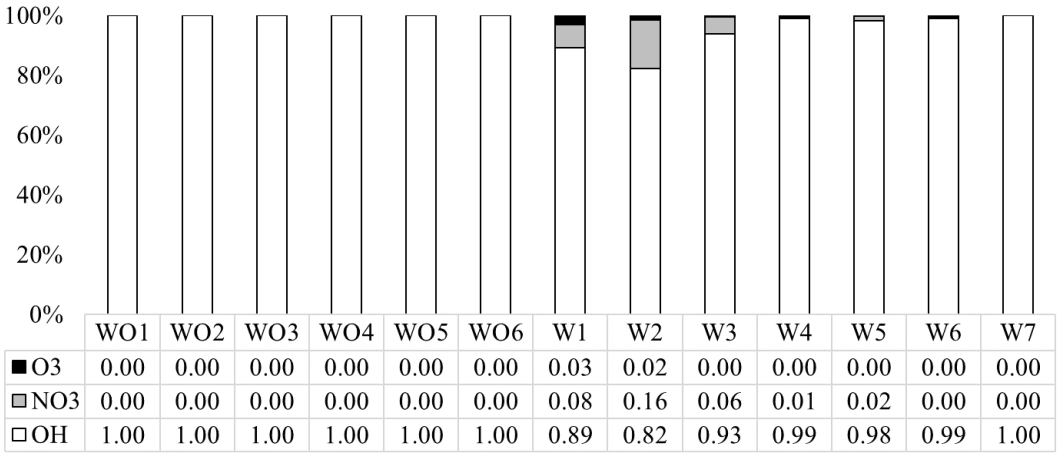


Figure S2. Comparison of the chamber data (dots) and model simulation results (lines) for the photo-oxidation of camphene with added NO_x. Two blank figures were due to measurement and modeling limitation. Experimental OH mixing ratio was calculated as:

$[OH]_{exp} = \frac{\frac{d[Cam]_{exp}}{dt} - k_{Cam,O_3}[Cam]_{exp}[O_3] - k_{Cam,NO_3}[Cam]_{exp}[NO_3]_{exp}}{k_{Cam,OH}[Cam]_{exp}}$, by assuming $[NO_3]_{exp} \approx [NO_3]_{sim}$; the chamber $[OH]$ curves showing in the figure were either averaged throughout the experiment or until complete consumption of camphene.



	WO1	WO2	WO3	WO4	WO5	WO6	W1	W2	W3	W4	W5	W6	W7
■O3	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.02	0.00	0.00	0.00	0.00	0.00
▒NO3	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.16	0.06	0.01	0.02	0.00	0.00
□OH	1.00	1.00	1.00	1.00	1.00	1.00	0.89	0.82	0.93	0.99	0.98	0.99	1.00

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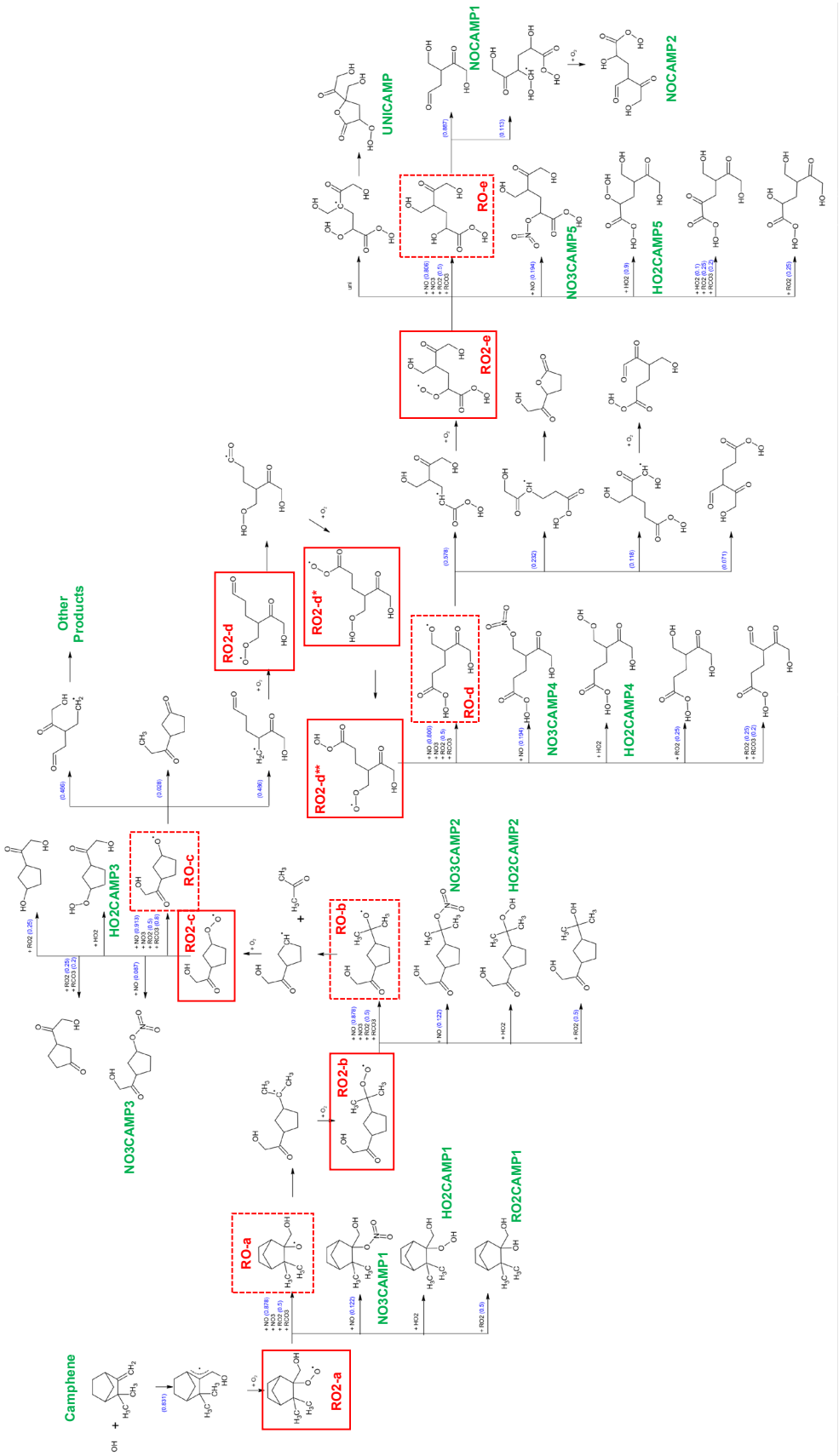
Figure S3. Fractions of the precursor reacted by oxidants from SAPRC (with added NO_x and without added NO_x).



40 **Figure S4. Detailed schematic of the OH-initiated oxidation of camphene mechanism in SAPRC at 298 K and atmospheric pressure with added NO_x.**

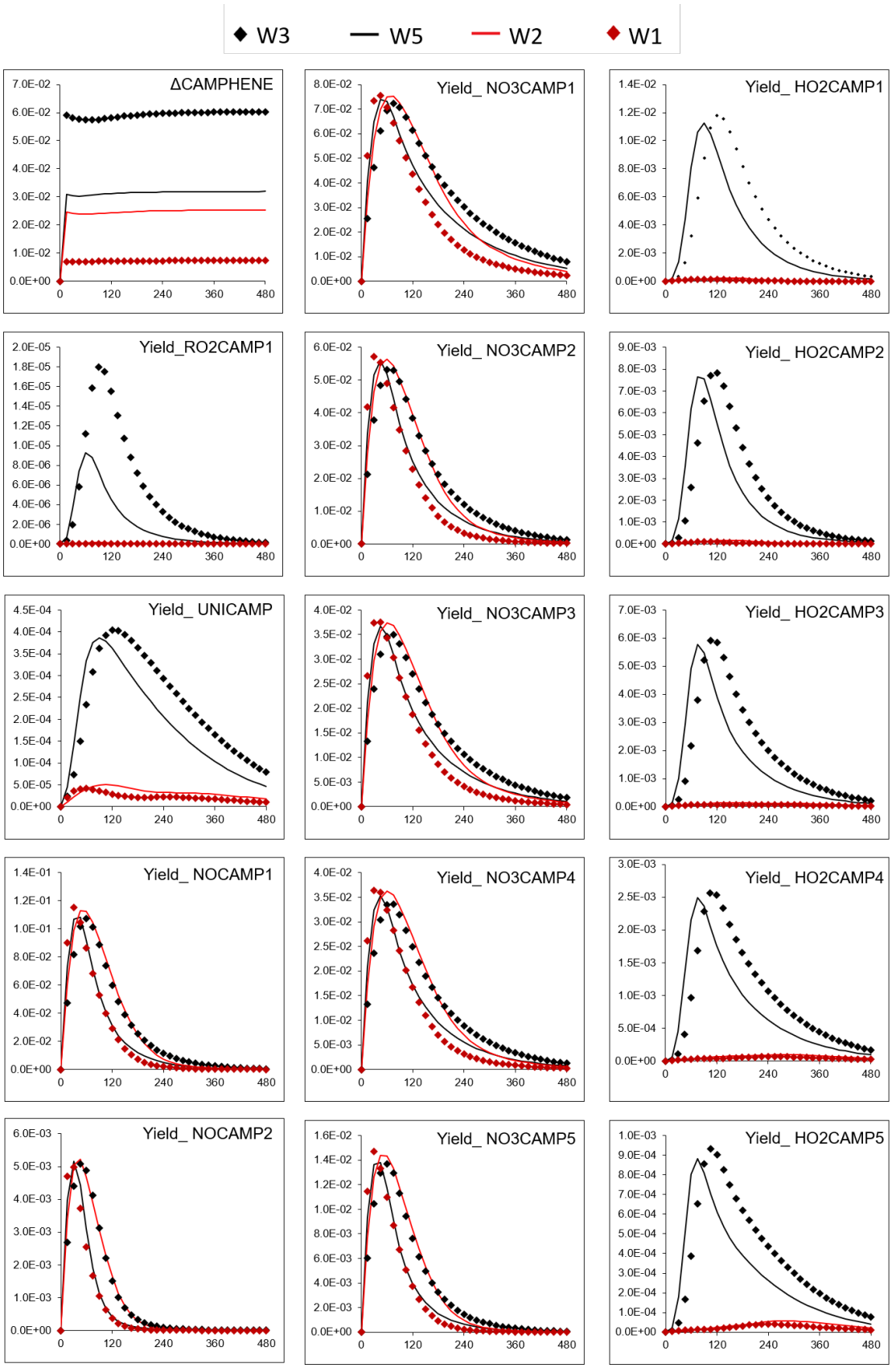


Figure S5. Time resolved predicted products yield distribution of W3, W5, W1 and W2 by SAPRC. The yield of the product is calculated as: $Yield = \Delta[Product]/\Delta[CAMPHENE]$.

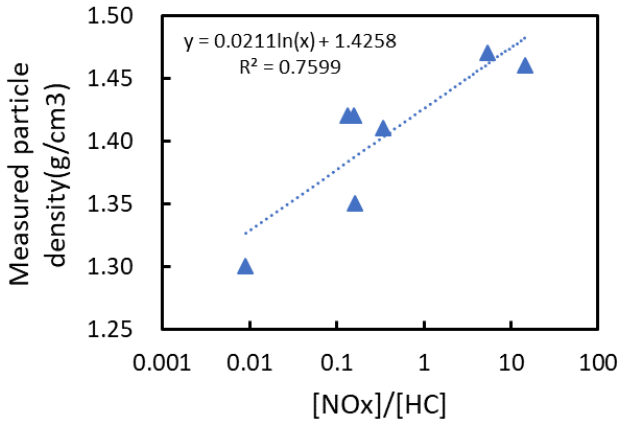


Figure S6. Fit function for measured particle density over $[NOx]_0/[HC]_0$.

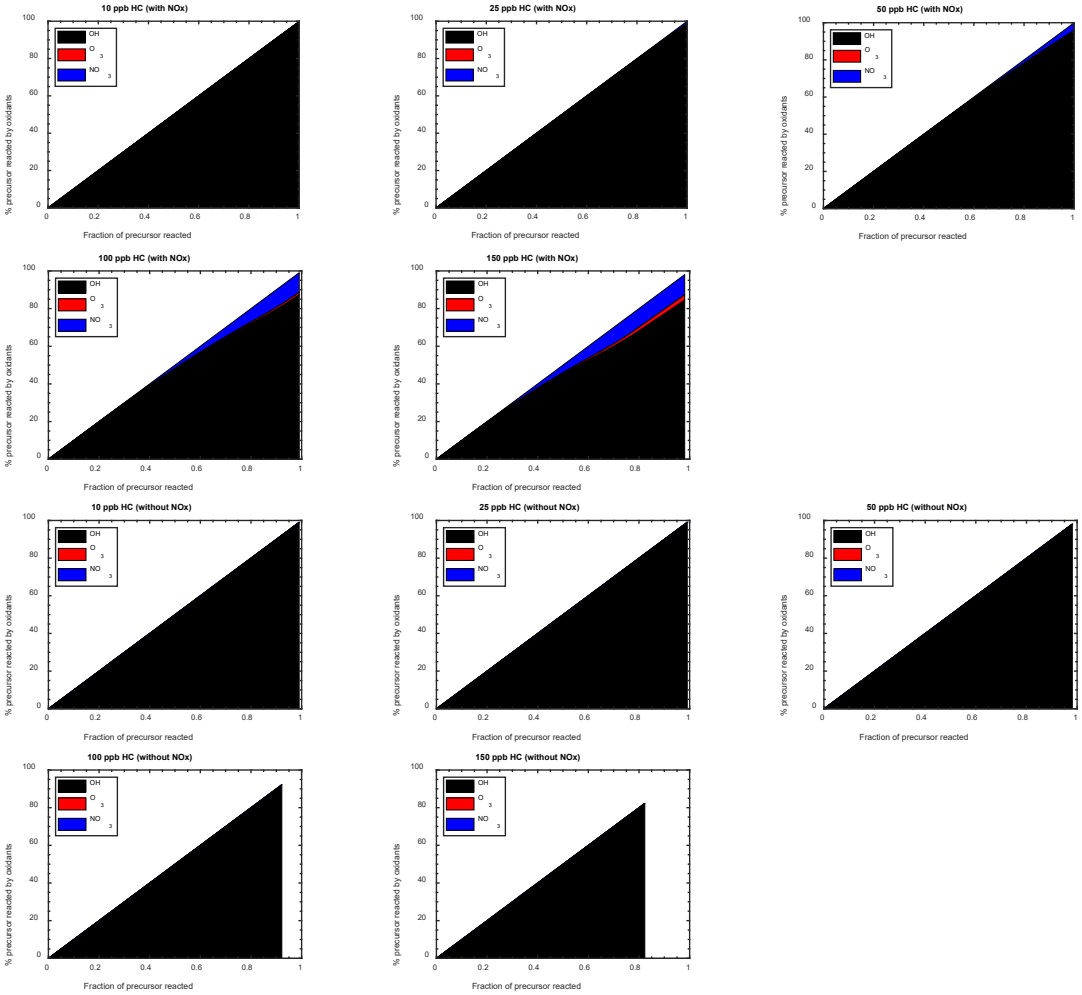


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Figure S7. Fractions of the precursor reacted by oxidants from GECKO-A (with added NO_x and without added NO_x).