The impact of CO on secondary organic aerosols formed from the mixture of α-pinene and n-dodecane: Supplementary

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Table S1. Instrument availability for each experiment.

Experiment Type	Experiment No.	FIGAERO-CIMS	C-ToF-AMS	PTR-ToF-MS	Gas analysers
α-pinene	1	×	√	√	√
α-pinene	2	√	√	√	√
α-pinene + CO	3	√ (2 cycles)	√	√	√
n-dodecane	4	×	√	×	√
n-dodecane	5	√	√	√	√
n-dodecane + CO	6	√	√	√	√
n-dodecane + CO	7	√	√	√	√
mixture	8	√	√	×	√
mixture	9	√	√	√	√
mixture + CO	10	√	√	√	√
mixture + CO	11	×	√	√	√

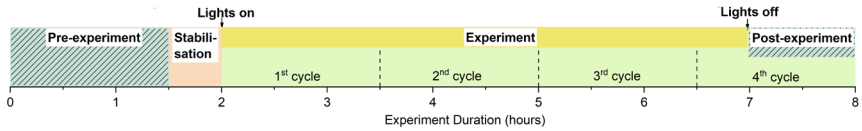

Figure S1: Schematic of the experimental timeline.

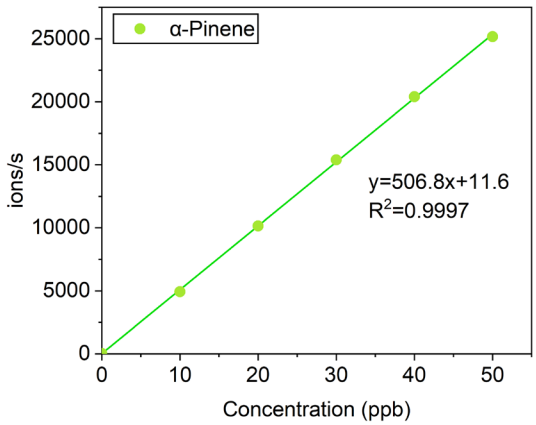

Figure S2: Calibration curve for α-pinene using Vocus PTR-ToF-MS (Experiment 3).

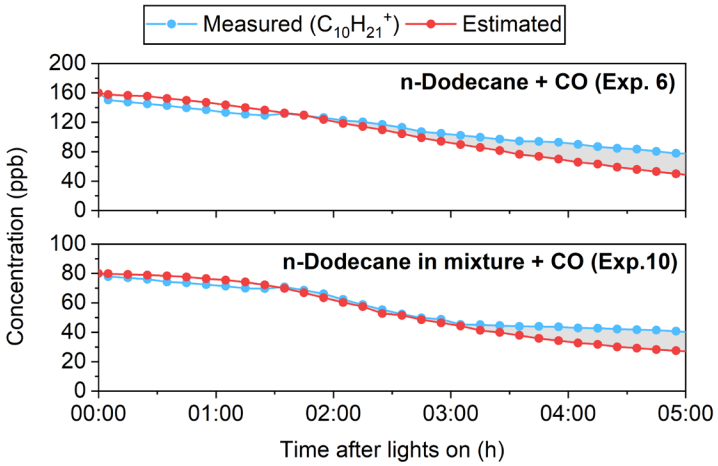

Figure S3: Comparison of n-dodecane concentrations estimated from OH concentrations (derived from CO decay) with those measured directly from the $C_{10}H_{21}^+$ fragment ion using Vocus PTR-ToF-MS. Note: During the first three hours of the reaction, the differences between the measured and estimated values were small. However, as the reaction progressed, the $C_{10}H_{21}^+$ signal may have been interfered with by other oxidation products, leading to an overestimation of the measured concentrations (grey shaded area). As a result, the SOA particle mass yields of n-dodecane and mixture may have been overestimated by up to ~30 % in this study. Nevertheless, the observed effects of CO on the overall trends and relative differences in yields remain reliable.

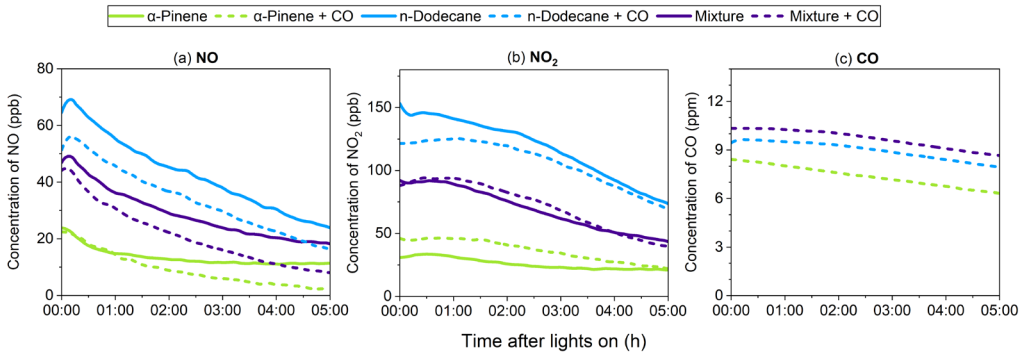

Figure S4: Time series of NO, NO_2, and CO in α-pinene, n-dodecane, and mixture experiments conducted in the absence (solid lines) and presence (dashed lines) of CO.

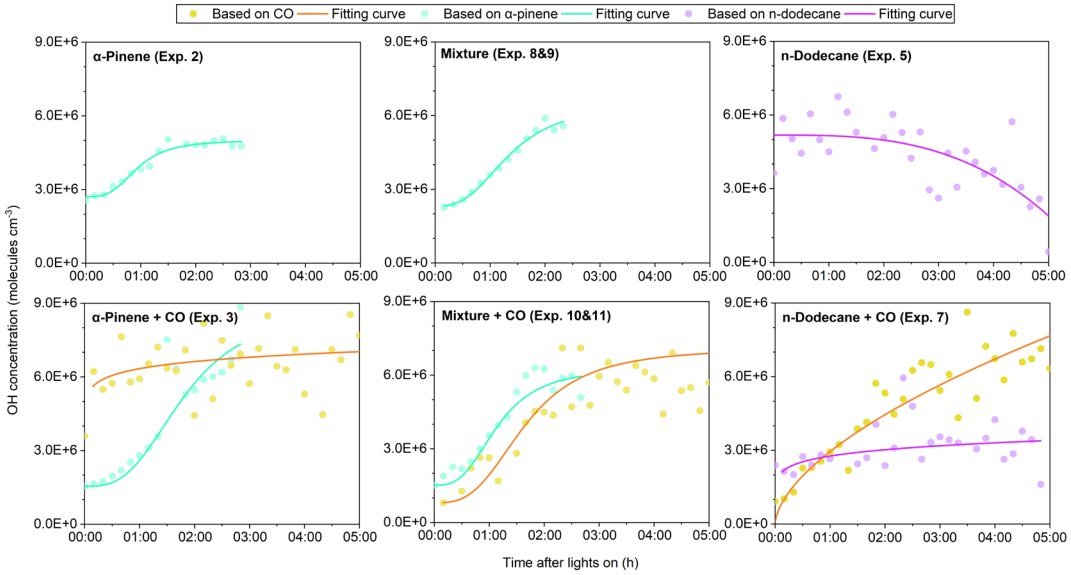

Figure S5: Estimated OH concentrations derived from the decay of precursors or CO. Fitting curves are shown as a visual guide. Data are from representative experiments.

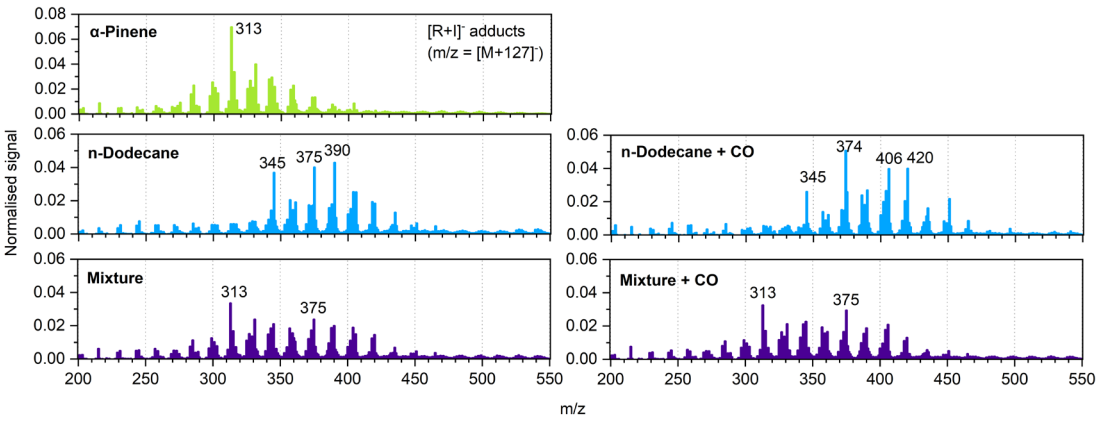

Figure S6: Unit mass resolution (UMR) spectra of SOA particles from α-pinene, n-dodecane and mixture experiments conducted in the absence and presence of CO (last FIGAERO cycle). Signal intensities are normalised to 1.

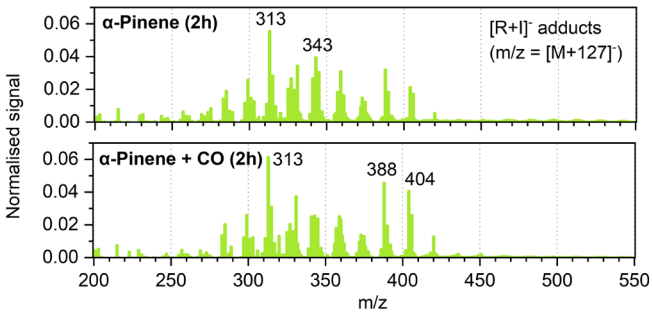

Figure S7: Unit mass resolution (UMR) spectra of SOA particles from α-pinene experiments conducted in the absence and presence of CO (second FIGAERO cycle). Signal intensities are normalised to 1.

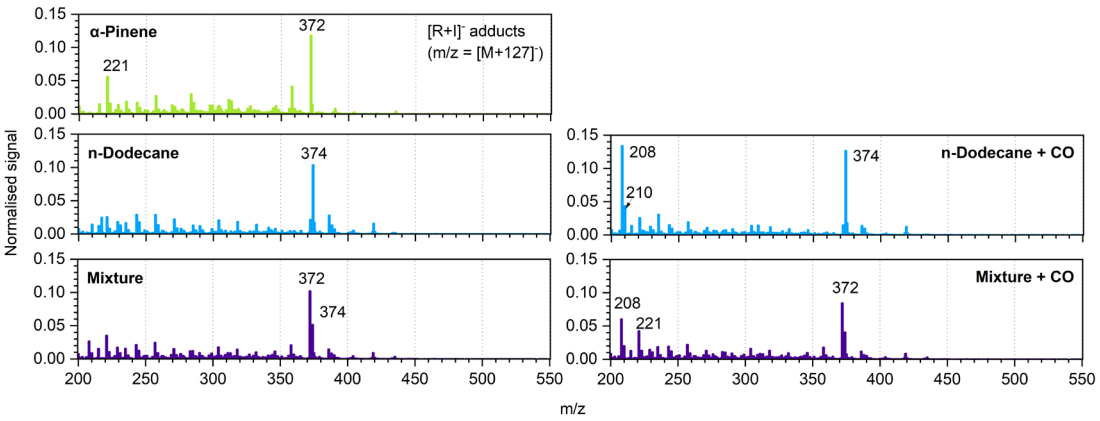

Figure S8: Unit mass resolution (UMR) spectra of gas-phase products from α-pinene, n-dodecane and mixture experiments conducted in the absence and presence of CO (last FIGAERO cycle). Signal intensities are normalised to 1.

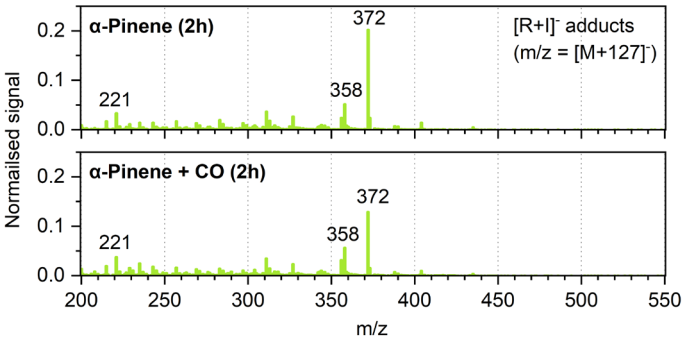

Figure S9: Unit mass resolution (UMR) spectra of gas-phase products from α-pinene experiments conducted in the absence and presence of CO (second FIGAERO cycle). Signal intensities are normalised to 1.

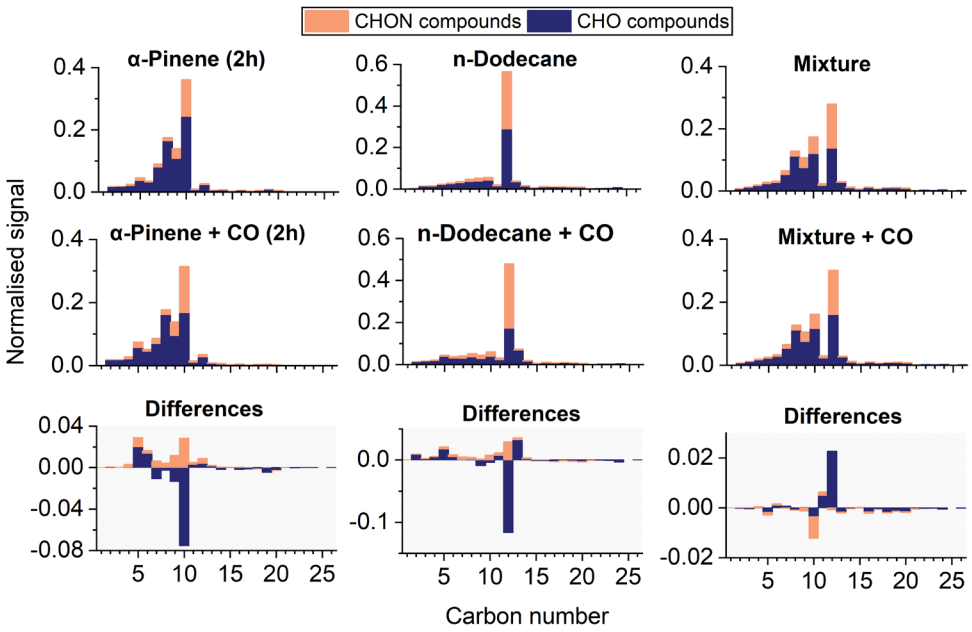

Figure S10: Carbon number distributions of particle-phase SOA compounds from α-pinene, n-dodecane, and their mixture, in the absence and presence of CO. The bottom panels show the differences between the CO-present and CO-absent experiments.

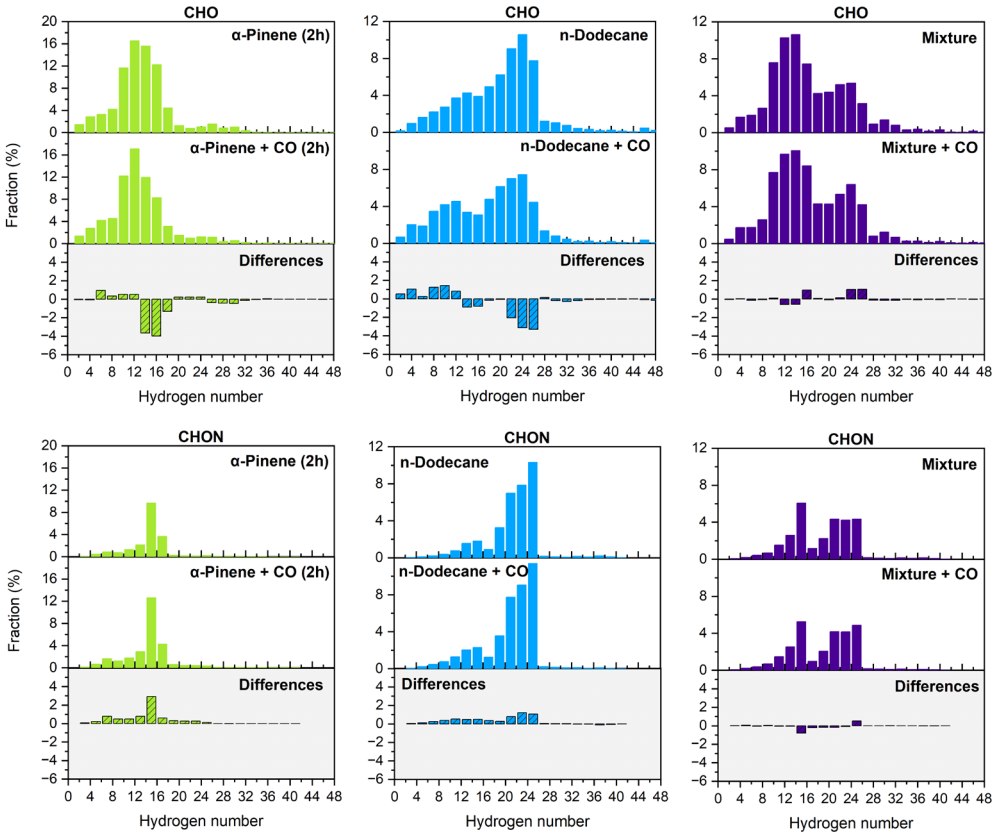

Figure S11: Hydrogen number distributions of particle-phase CHO and CHON compounds from α-pinene, n-dodecane, and their mixture, in the absence and presence of CO. The bottom panels show the differences between the CO-present and CO-absent experiments.

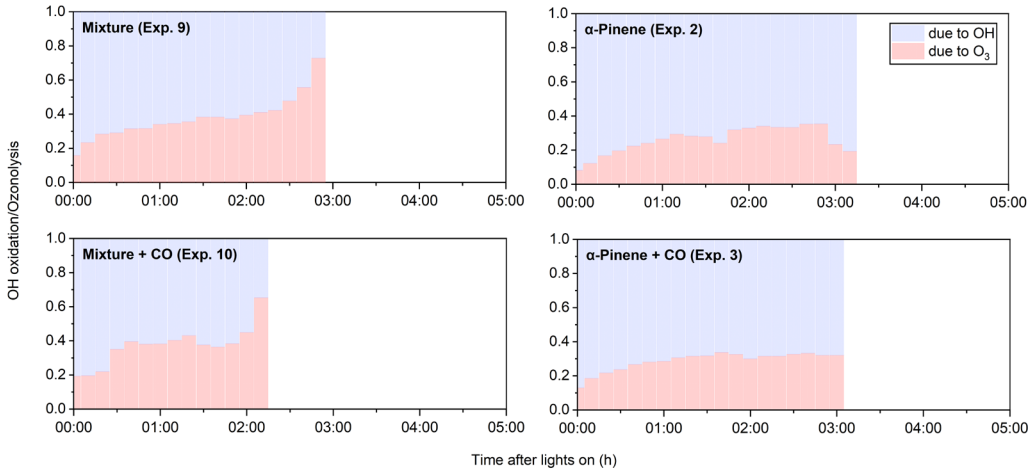

Figure S12: Relative contributions of OH and O_3 to α-pinene oxidation. The contributions of OH radicals and O_3 to α-pinene decay were estimated based on their concentrations and reaction rate coefficients. Data are from representative experiments.