Supplementary Materials

Atmospheric Chemistry of 2-Methoxypropene and 2-Ethoxypropene: Kinetics and Mechanism Study of Reactions with Ozone

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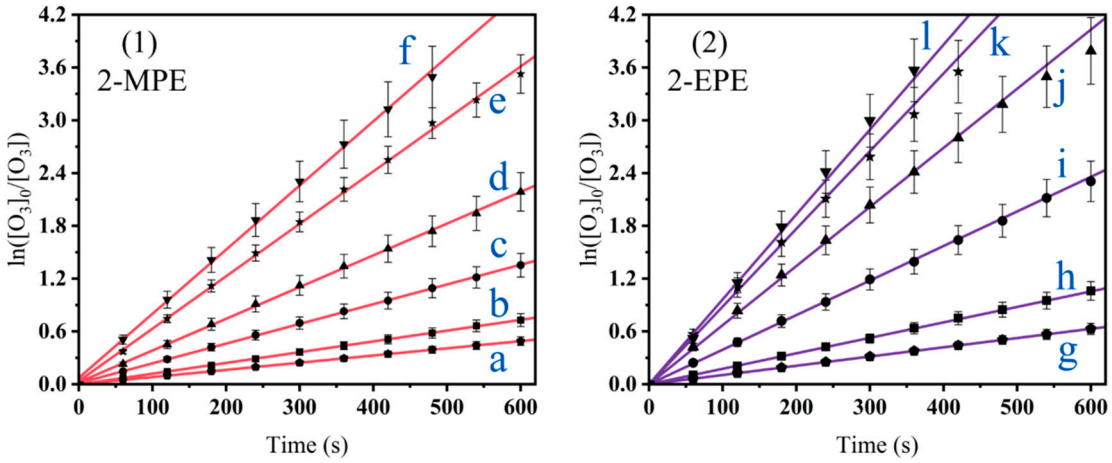


Figure S1. Plots of $\ln([O_3]_0/[O_3])$ versus reaction time for different initial 2-MPE (1) and 2-EPE (2) concentrations. $[2\text{-MPE}]_0$ = 6.68 (a), 13.36 (b), 26.72 (c), 40.07 (d), 53.43 (e), 66.79 (f) × 10^{13} molecule cm^{-3}. $[2\text{-EPE}]_0$ = 5.59 (g), 11.18 (h), 22.37 (i), 33.55 (j), 44.73 (k), 55.91 (l) × 10^{13} molecule cm^{-3}.

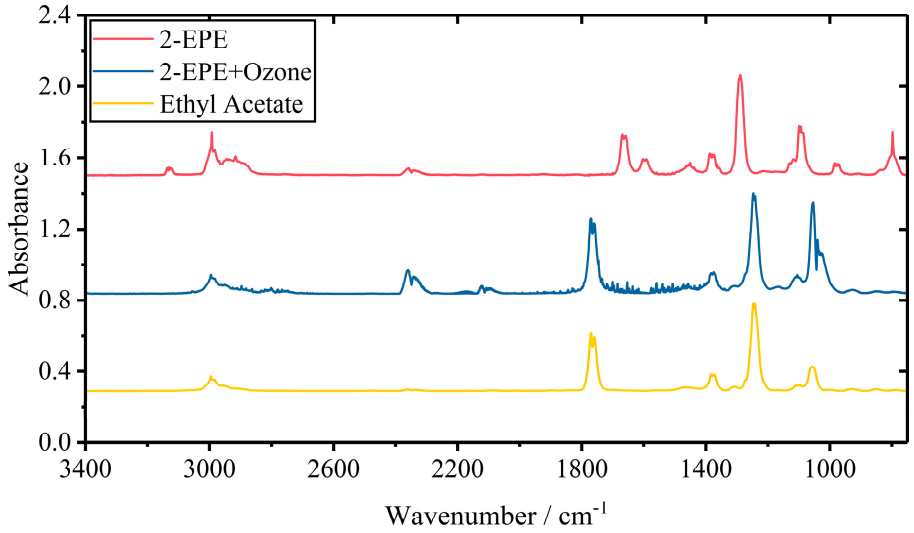


Figure S2. IR spectra of the detected products in the reaction of 2-EPE with O_3. The violet line (top) indicates the spectrum of 2-EPE at t = 0 h, the green line (middle) represents the spectrum of 2-EPE at t= 2 h and the brown line is the standard ethyl acetate.

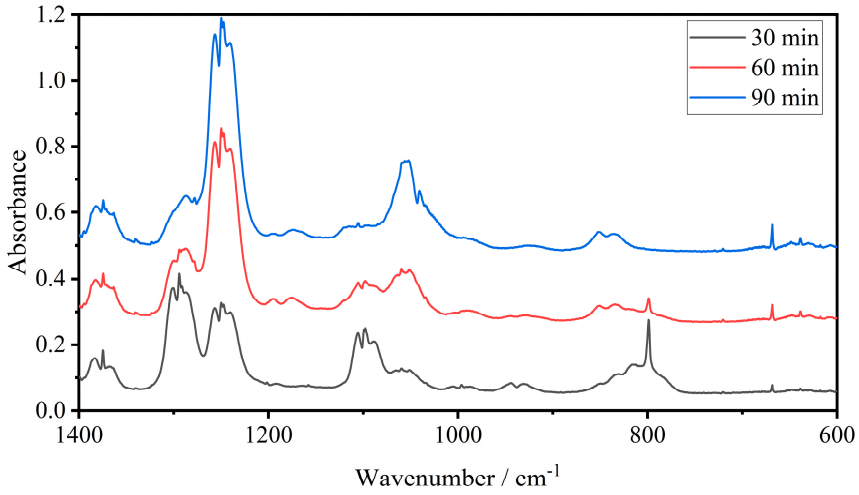
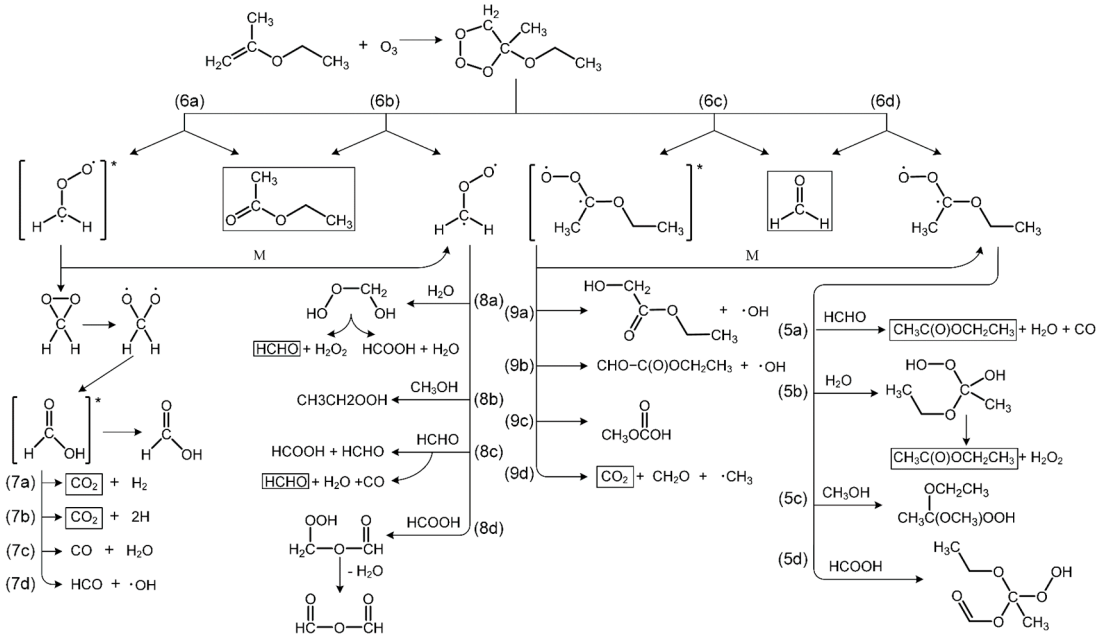


Figure S3. The 2-MPE with O_3 reaction process monitored by FTIR spectra.



Scheme S1. Proposed mechanism for the reaction of 2-EPE with O_3.

Table S1. The experimental conditions and first-order rate constants for the reactions of O_3 with 2-MPE and 2-EPE using the absolute method at (298 ± 2) K in 1 atm of air

Vinyl ether	[Substrate] 10^{14} molecule cm^{-3}	$[O_3]_0$ 10^{12} molecule cm^{-3}	[Cyclohexane] 10^{16} molecule cm^{-3}	$-dln[O_3]/dt$ 10^{-4} s^{-1}
2-MPE 2-methoxypropene	0.64 ± 0.01	1.72	5.6	7.02 ± 0.01
	1.28 ± 0.03	2.46	5.6	16.1 ± 0.02
	2.56 ± 0.05	2.95	5.6	32.5 ± 0.05
	3.84 ± 0.07	3.44	5.6	46.4 ± 0.08
	5.12 ± 0.10	3.44	5.6	60.7 ± 0.12
	6.39 ± 0.13	3.95	5.6	73.4 ± 0.15
		$k_{2\text{-MPE}} = (1.18 \pm 0.13) \times 10^{-17}$ cm^3 $molecule^{-1}$ s^{-1}		
2-EPE 2-ethoxyproene	0.54 ± 0.01	1.48	5.6	8.95 ± 0.01
	1.07 ± 0.02	2.46	5.6	17.7 ± 0.03
	2.14 ± 0.04	2.83	5.6	38.9 ± 0.07
	3.21 ± 0.06	3.20	5.6	65.5 ± 0.12
	4.28 ± 0.09	3.30	5.6	86.1 ± 0.15
	5.35 ± 0.11	3.44	5.6	96.3 ± 0.18
		$k_{2\text{-EPE}} = (1.89 \pm 0.23) \times 10^{-17}$ cm^3 $molecule^{-1}$ s^{-1}		