Electronic Supplementary Information for

Gas-phase reaction of two unsaturated ketones with Cl atom and O_3: kinetics and products

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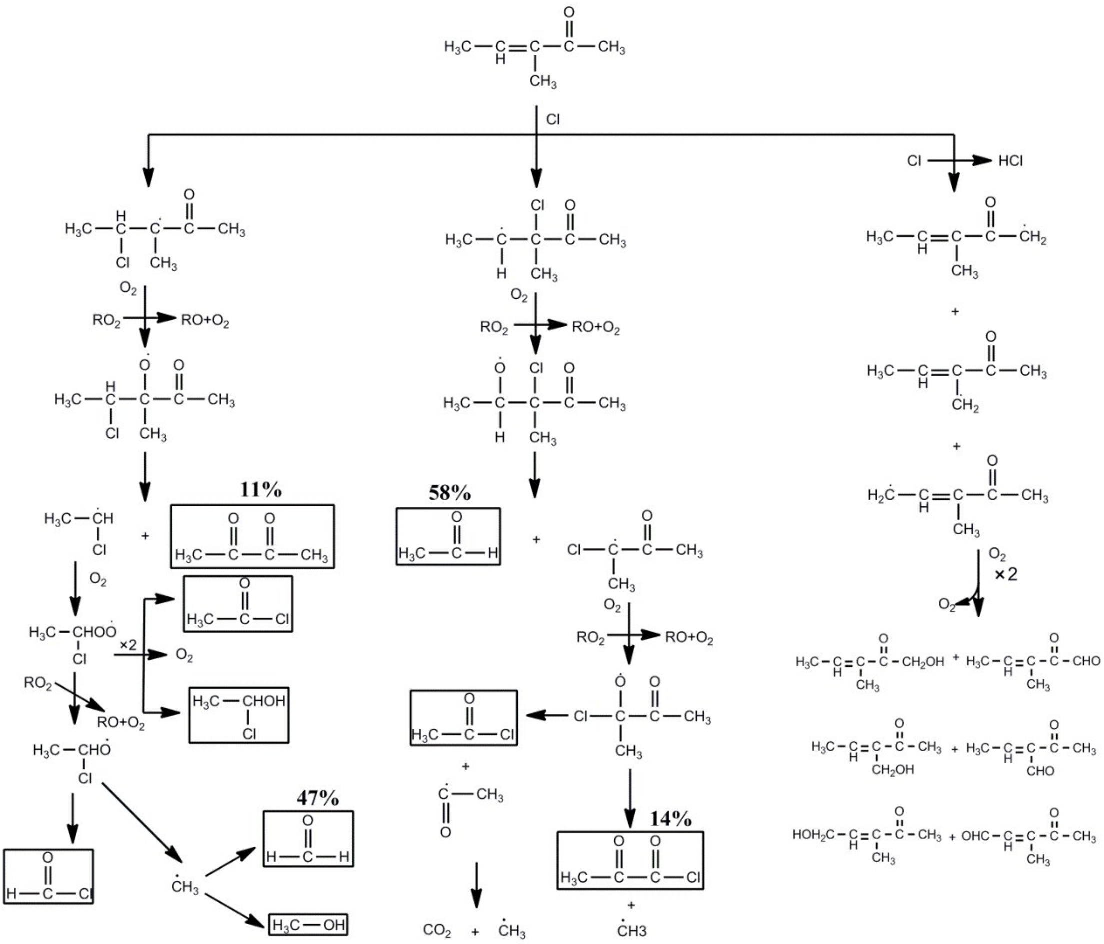
1. The Calibration of PTR-MS

We made calibrations for the two reactants (MBO332 and MPO332) and the five products: formaldehyde, acetaldehyde, formic acid, methanol and 2, 3-butanedione. They were calibrated by the commercial standards in the PTR-MS using the Teflon bags[1].

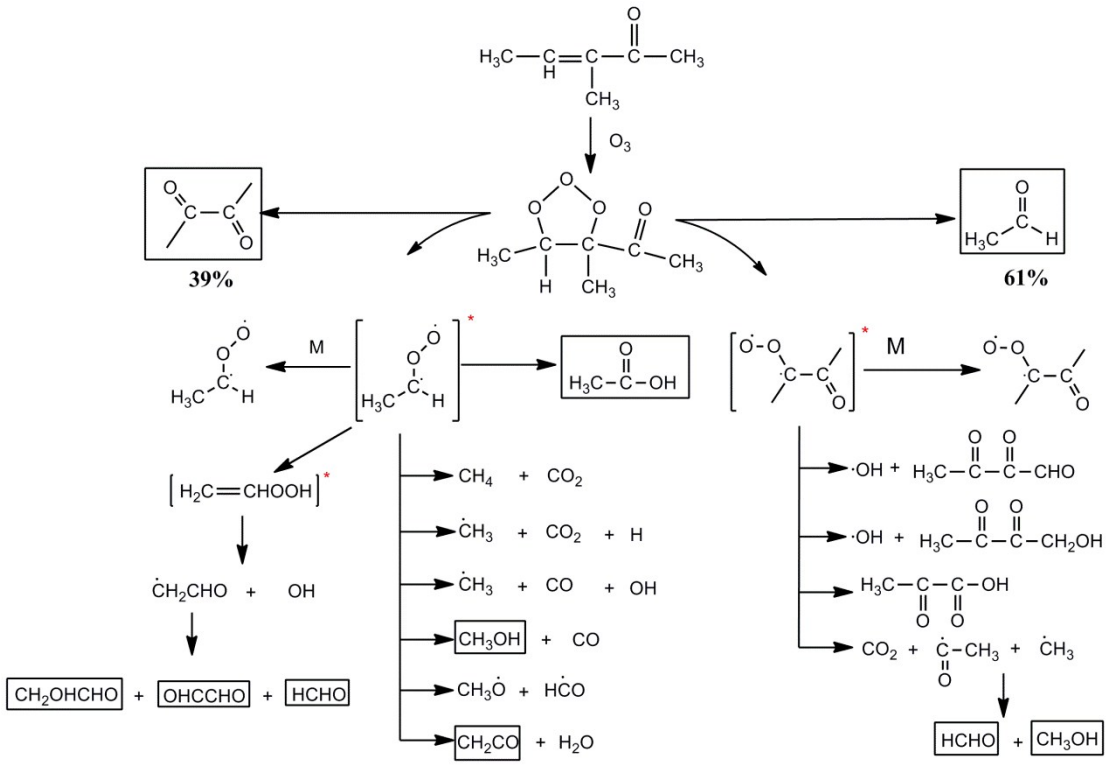
The concentrations of compounds for which pure commercial standards were not available were determined by the measured rate constants of the proton transfer reactions[2,3]. For the products without measured rate constants, an estimated rate constant (k) of 2×10^{-9} cm^3 $molecule^{-1}$ s^{-1} was used. The rate constantsfor the proton transfer reaction of most compounds are generally within ±20% of the estimated k.

Scheme S1. Proposed Reaction pathways for the reaction of MPO332 with Cl atom

Scheme S2. Proposed reaction pathways of MPO332 with O_3



Scheme S1. Proposed Reaction pathways for the reaction of MPO332 with Cl atom



Scheme S2. Proposed reaction pathways of MPO332 with O_3

Reference

1. A. Lee, A. H. Goldstein, M. D. Keywood, S. Gao, V. Varutbangkul, R. Bahreini, N. L. Ng, R. C. Flagan and J. H. Seinfeld, *J. Geophys. Res.-Atmos.*, 2006, **111**.
2. W. Lindinger and A. Jordan, *Chem. Soc. Rev.*, 1998, **27**, 347-375.
3. J. Zhao and R. Zhang, *Atmos. Environ.*, 2004, **38**, 2177-2185.