

# ***Interactive comment on “Acid-yield measurements of the gas-phase ozonolysis of ethene as a function of humidity using Chemical Ionisation Mass Spectrometry (CIMS)” by K. E. Leather et al.***

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- Thanks for the additional information on wall losses. It remains, however, that HMHP has been frequently observed in the atmospheric boundary layer. Furthermore, I'm not aware of any other known source of HMHP besides the  $\text{CH}_2\text{O}_2 + \text{H}_2\text{O}$  reaction.
- The  $\text{HCOOH}$  yields from the study of Lee et al. (2006) include formation pathways other than the one considered here (the  $\text{CH}_2\text{O}_2 + \text{H}_2\text{O}$  reaction). This is obviously true in the case of  $\alpha$ -pinene; but it is also very likely for terpenes having terminal double bonds.

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- The sentence from Larsen et al. (page 271, lines 14–17), mentioned by C. Percival, “*Comparison of the results of the present work to previous studies on the ozone-initiated oxidation of terpenes (e.g., Glasius et al., 2000), show that OH-radical reactions with terpenes form significantly smaller amounts of carboxylic acids than ozonolysis reactions*” refers obviously to low-volatility acids (e.g. pinic acid etc.), not formic acid. In fact, Glasius et al. (2000) did not measure HCOOH in their experiments.
- The ozonolysis of isoprene generates the Criegee biradical  $[\text{CH}_2\text{OO}]^*$  along with MVK or MACR. Stabilisation is but one of the possible fates of  $[\text{CH}_2\text{OO}]^*$ , along with prompt unimolecular reactions. Therefore the yield of the stabilised Criegee intermediate  $\text{CH}_2\text{OO}$  (which upon reaction with  $\text{H}_2\text{O}$ , generates HMHP and finally HCOOH) is lower than the yield of  $[\text{CH}_2\text{OO}]^*$ . The HCOOH yield of 0.6 mentioned by C. Percival is at least a factor of 2 too high, considering the measurements of Neeb et al. (1997) and Hasson et al. (2001).

#### References

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