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Atmospheric
Chemistry
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Discussions

Interactive comment on "Atmospheric chemistry of carboxylic acids: microbial implication versus photochemistry" *by* M. Vaïtilingom et al.

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First, we would like to thank Yi Tan for the relevant comments and remarks that will be considered in the revised version of the manuscript (if accepted for publication). Our responses are listed below:

1- Questions about the source of OH radicals in photodegradation tests:

In our photodegradation tests, the durations for complete hydrogen peroxide consumptions were approximately of 6 and 48 h for incubations in irradiation setups S1 and S2. The degradation rates in S1 were determined over the 4 first hours of incubation and over the 8 first hours for experiments in S2; H2O2 was available over these incubation-times. Concerning the non-photodegradation of acetate and succinate, we

are conscious that our photochemical experiments are not adapted to fully reproduce real cloud condition. This is the reason why we added in the manuscript other photochemical scenarios that derive from calculations using kinetic constants and typical OH concentrations from literature. Photo-production of oxalate is considered in atmospheric chemistry modelling studies and also demonstrated in several experimental investigations. Our artificial cloud water is a simplified medium that contains few carbon sources (such as aldehydes, etc.). So, in the absence of photo-production pathway, the effective degradation of oxalate observed in the artificial cloud medium seems consistent. In addition, the oxalate reactivity with OH radical was confirmed by Ervens et al. (2003).

2- Questions about detection limits:

Samples from experiments performed in S1 and S2 were diluted by a factor 5 before analysis by ionic chromatography. Detection limit of succinate is close to 15 nM for our analytical conditions. The nitrate and succinate peaks are correctly separated over time and no interference is observed. The retention times are 12 and 15.4 min for nitrate and succinate, respectively, for our eluant (HO-) concentration gradient (specific for low concentration).

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