

Interactive comment on “Aerosol Mass yields of selected Biogenic Volatile Organic Compounds – a theoretical study with near explicit gas-phase chemistry” by Carlton Xavier et al.

Anonymous Referee #2

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This is a good informative study that compares MCM and MCM+PRAM mechanisms to derive model capabilities of known peroxy radical autooxidation mechanisms.

Following are some comments that are recommended to improve the current work: 1. Add a section on experimental details before model description. This could be just a summary of various experimental studies the work is using to evaluate the model with justifications for why they were chosen.

2. On page 17 the authors mention T-dependence of peroxy radical autooxidation needs further improvement/validation. More details on their assumed T-dependence in PRAM are needed. For example, what was the assumed T-dependence as a function

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of precursor VOC, oxidant, NO etc.? What was the T-dependence of saturation vapor pressures of SVOCs in Figure 7? Seems there are 2 different T-dependence that need to be explicitly stated: (A) T-dependence of autooxidation chemistry (B) T-dependence of their C^* i.e. saturation vapor pressure or a physical process of gas-particle partitioning

This is T-dependence is a very important part and needs to be discussed clearly. Also discuss measurements of such T-dependencies as applicable.

(3) Figure 7: Would it be possible to start with a VBS fit at 313 K, and then derive the VBS fit at 258K or vice versa with these T-dependencies without having to run MCM+PRAM at each of these temperatures? This is important for regional and global models that rely on VBS and cannot run full MCM+PRAM.

(4) Do the authors have any recommendations for condensed versions of MCM+PRAM that could be used in regional and global models to predict SOA yields and their oxidation state?

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