

Interactive comment on “A zero-dimensional view of atmospheric degradation of levoglucosan (LEVCHEM_v1) using numerical chamber simulations” by Loredana G. Suciu et al.

Anonymous Referee #2

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This paper describes a 0-D modeling framework that has been developed to examine the atmospheric degradation of levoglucosan, an important biomass burning tracer. The model employs the BOXMOX model and is called LEVCHEM_v1. The authors have updated the chemical mechanisms to include degradation of levoglucosan and intermediary products as well as added a gas-particle partitioning mechanism to account for effects of evaporation and condensation on the concentration of levoglucosan. Additionally, they have run their model on data from photo-oxidation chamber experiments of levoglucosan. The results are presented and discussed.

Overall, this is a very good paper. The authors have done a great job explaining their

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model. The paper seems scientifically sound and is easy to follow. I would highly encourage the authors to try out their model on ambient levoglucosan data from aircraft campaigns that were able to follow smoke plumes over time such as WINTER and WE-CAN. I really just have a handful of minor comments outlined below that need to be addressed before the paper can be considered for publication.

General Comments: In the paper it seems to go back and forth if it is written as gas-phase and aerosol-phase (with hyphens) or gas phase and aerosol phase (without hyphens). This should be checked throughout the entire text.

Specific Comments: Line 73 – Suggest adding an of after developed use

Line 173 – Suggest changing particle phase to particle-phase

Line 260 – The comma after Supplemental Information) should be a period

Line 340 – There is an extra space in gas-phase

Line 393 – In the Alvarado et al. reference, periods are missing in the initials for author Akagi

Line 394 – In the Arangio et al. reference, believe oh should be capitalized

Figure 3 -In the plot titles, the hyphen is missing in Gas-phase and Aerosol-phase

Figure 8 -In the plot titles, the hyphen is missing in Gas-phase and Aerosol-phase

Figures S3, S4, S5, S6 -In caption, the hyphen is missing in gas-phase and aerosol-phase

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