

## ***Interactive comment on “Inter-comparison of laboratory smog chamber and flow reactor systems on organic aerosol yield and composition” by E. A. Bruns et al.***

**Anonymous Referee #2**

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General Comments:

In this paper the authors describe results of laboratory studies that compared the results of aerosol aging experiments conducted in a smog chamber, micro-smog chamber, and potential aerosol mass flow reactor. The latter device is often used to obtain high concentrations of OH radicals that allow more extensive oxidation of organic aerosol than can be obtained in a large smog chamber. The micro-smog chamber is a more recent device that is meant to serve a similar purpose. An important question is whether exposures of high OH concentrations for short periods of time is equivalent to exposure to low OH concentrations for long periods of time, which is expected to be

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more similar to the atmosphere. In this study the aerosol composition was measured with an aerosol mass spectrometer, aerosol mass with a scanning mobility particle sizer, organic gas phase species with a proton transfer reaction mass spectrometer, and other gases such as NO<sub>x</sub>, O<sub>3</sub>, CO with other monitors. Oxidative aging was compared for aerosol formed from the reaction of alpha-pinene with ozone and for woodsmoke aerosol. The experiments appear to be technically sound and the data analysis and interpretation is reasonable. The results will be useful for comparison with future studies conducted with these instruments. The manuscript is also clearly written. Overall, the manuscript represents a useful contribution to the literature and so I think should be published. I have a few suggestions.

Specific Comments:

1. The approach of the paper is to mostly note similarities and differences among the results obtained with the three aging apparatus and then provide reasonable speculations about the causes. Although the observations are interesting and may be useful, it seems that no new fundamental insights have been obtained. I come away from reading the paper with a feeling that I have learned relatively little other than sometimes results are similar and other times they are not. Are there no take-home messages? What do you conclude about the advantages and disadvantages of the different approaches? Are there conditions where one approach is likely to work better or worse than the others? How reliable is each approach? Is it worth doing other studies to try to investigate in more detail the various factors discussed as possible sources of differences? What specifically do you suggest? What is the likelihood that one or the other or any approach gives results that are representative of the atmosphere? Some effort should be made to give the reader something to take away.

Technical Comments:

None.