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Atmospheric Measurement Techniques Discussions

Interactive comment on "A portable dual smog chamber system for atmospheric aerosol field studies" *by* Christos Kaltsonoudis et al.

Anonymous Referee #2

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Review for "A portable dual smog chamber system for atmospheric aerosol field studies" by Christos Kaltsonoudis et al.

This paper presents the construction and characterisation for a transportable twin Teflon chamber design for atmospheric chemistry/physics experiments. The two chambers with a relatively small volume of 1.5m3 each were designed to allow field deployment and ease of transport and to assess the effects of a perturbation (e.g. oxidant concentration) to ambient air. Using their standard set of analysis instruments, i.e. smps, NOx and O3 analysers, PTR-MS and AMS, the chamber volume allows for four hour experiments, which is a typical duration for many chamber experiments. Particle wall losses, inherently variable in Teflon chamber experiments, were particularly carefully determined and were measured at the end of each experiments. Such a careful

experiment protocol should be adopted by other chambers.

Overall this paper describes an interesting design of an atmospheric simulation chamber and I recommend publication in AMT. I suggest the authors consider the few minor points listed below:

Line 105ff. Six panels with 36 UV lights are used to allow photo-oxidation experiments resulting in a J(NO2) of < 0.1 min-1. How does this number compare with other indoor chamber? I think it would be useful for readers if a UV-Vis spectrum of the lamps would be added as a figure.

Line 128. A compressor is used to provide clean air and an activated carbon and silicagel denuders are used to purify the compressed air before introduction into the chamber. How efficient were these denuders to remove O3 and VOCs? Is NOx efficiently removed by this set up?

Line 185. Please describe the meaning of the "theta angle", which is used several times in the paper, for the non-specialist reader.

Line 193. Are the significant losses of particles < 80nm mainly occurring in the pump? How long is the tubing from the inlet to the chambers?

Line 216. Why was the particle loss rate constant over the measured particles sizes in the lab experiments but shows a strong size dependence in field experiments?

Figure 5. This control experiment demonstrates that an entirely deflated chamber caused larger wall losses of particles. Does this result affects the standard field operation of the chambers? Are they transported to the field partially inflated?

Figure 9 and 10. I recognise that this is a chamber characterisation paper but it would be nice if the authors could add a few more thoughts on the interpretation of the measurements they present in figures 9 and 10. How significant are the changes observed? How do these changes compare to organic aerosol evolution in the ambient atmosphere or with "normal" SOA chamber experiments?

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