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Atmospheric Measurement Techniques Discussions

Interactive comment on "Evaluation of the performance of a particle concentrator for on-line instrumentation" *by* S. Saarikoski et al.

Anonymous Referee #2

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Review of Evaluation of the performance of a particle concentrator for on-line instrumentation by Saarikoski et al.

General comments:

This paper describes the performance evaluation of the miniature Versatile Aerosol Concentration Enrichment System (m-VACES) for online measurements of aerosols. The authors used various instruments including APS, SMPS, and SP-AMS for the evaluation. They showed the dependence of enrichment factors (EF) on particle size and composition and discussed potential sampling artifacts. The experiments were performed carefully and the interpretation sounds mostly reasonable. I think this paper may be publishable after some minor revisions.

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Specific comments:

Abstract and conclusions: The authors state that the operation of the m-VACES was not found to lead to any severe sampling artifacts. However, the time period for the ambient measurement was too short to draw definitive conclusions. In fact, there seems to be substantial uncertainty in the PMF analysis due to limitation of the dataset (section 3.2.5). I recommend the authors clearly show the time period in the abstract and conclusions and state that further ambient tests are needed. This is important for organic aerosols because the chemical properties of organics may significantly vary depending on time and locations. On the other hand, the current abstract is somewhat redundant. It should be more focused on the important findings.

Figures 7: The size-dependent EF data in ambient air (Figure 7) are quite different from those in the laboratory (Figures 2 and 3), and I guess it was partially due to the mixing state of particles. Is there any possibility that particle morphology and phase were altered by water condensation and drying processes depending on the mixing state (and size) of particles? Does it affect the particle detection efficiency by the SP-AMS as mentioned in section 2.3.2?

Section 3.2.6: The detection of trace elements is interesting but the results are mostly qualitative and not very conclusive. I suggest that the whole section should be moved to SI.

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 2737, 2014.