

Interactive comment on “Chromatography related performance of the Monitor for AeRosols and GAses in ambient air (MARGA): laboratory and field based evaluation” by Xi Chen et al.

Xi Chen et al.

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Response to Anonymous Referee #2

Review of Chen et al. Chromatography related performance of MARGA. This paper is mainly concerned with showing the improvements in data quality through the use of a software tool as an alternative to the standard MARGA data analysis package provided by Applikon. This paper is within the scope of the journal. The authors report that their analysis using alternative proprietary software improves the accuracy of peak identification and corrects for a low bias in anions reported by the standard MARGA analysis. The comparison is grounded by a series of full system calibrations using

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standards of ammonium nitrate and sulfate. The two chromatogram analysis methods were also compared in the field.

Comment: Inflexibility of MARGA tools for the analysis and quality control of chromatograms. The main issue that authors highlight is the inflexibility of the software tools supplied with the MARGA system for the post-processing of data. This is especially problematical with field instruments especially those deployed over extended periods in the field. The authors note that this inflexibility is problematic when dealing with changing instrument performance such as when the column begins degrading with age. In addition to the issues regarding the usability and utility of the MARGA software tools the authors report that the MARGA itself is a useful tool for studying the relationships between the gas and particle phase composition in the atmosphere. I would say that obviously this has been shown before and data sets and validation of the instrument performance have been published by a number of authors.

Response: We agree. The MARGA has been utilized widely around the world and its utility in studies investigating atmospheric composition and air-surface exchange are well documented. A number of relevant publications have been cited in our introduction section (line 77-79).

Comment: My major recommendation for this paper is to add an explicit set of recommendations as if they were providing advice to other users or software developers. A number of issues with the data analysis and flexibility or lack of have been identified by the authors (and in my experience have also noted their existence and the difficulty in post processing of MARGA datasets adequately). In my opinion this instrument could do with far more manufacturer/user group interaction and Applikon may find that if researchers are given permission and the tools to modify and develop the software tools a far more powerful instrumental technique will be developed.

Response: Following the same comment from reviewer 1, a list of recommendations for improving MARGA data quality are now included in the conclusions section (from

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line 577):

“...we make the following recommendations for controlling accuracy: 1. do not rely solely on the LiBr internal standard to ensure accuracy of the chromatographic analysis, 2. calibrate with multi-point curves using external liquid standards, 2. use a range of external standards appropriate for expected ambient concentration levels and for resolving potential non-linearity in detector response at low concentrations.”

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