Atmos. Meas. Tech. Discuss., 5, C114–C116, 2012
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Atmospheric Measurement Techniques Discussions



# *Interactive comment on* "A gas chromatographic instrument for measurement of hydrogen cyanide in the lower atmosphere" *by* J. L. Ambrose et al.

**Anonymous Referee #2**

Received and published: 25 February 2012

The manuscript by Ambrose et al. describes a fully automated gaschromatographic system for the detection and quantification of HCN in ambient air. The instrument uses a thermoionic detector that allows great selectivity for nitrogen containing compounds, but as a downfall requires constant calibration in order to assess the decreased sensitivity overtime. Despite the loss of sensitivity observed during the sampling period the instrument seems to be able to accurately measure HCN at ambient concentration over an extended length of time. It seems that the biggest problem for the instrument is the variability in the HCN concentration in the zero air used, however it looks like the numerous calibration carried out should account for this variability. The other major point is that every data presented in the manuscript is limited to a 28 day period from March 3 to March 31, however the instrument was up and running for several months. It is unclear to the reviewer if the instrument performed with the same precision and



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accuracy over the whole length of the campaign, or if the change in the filaments affected the overall consistency of the measurements. The reviewer suggests including the same calibration curve shown in Figure 3 for the month of January or April, so that the reader could see that the instrument can perform consistently over a much longer period of time. The authors recognizes that the non zero HCN concentration in the zero air can affect the measurement and a big effort has been made in order to account for such variability. The simultaneous presence of a PTRMS at the sampling location offered the great opportunity of an intercomparison (using the CH3CN detected from the thermoionic detector) between instruments, but the reviewer recognized that even if it would strengthen the paper, it would largely increase the length of the paper. As a suggestion a possible intercomparison paper between the two instruments is highly recommended.

The paper is well written a few suggestions are included below:

Please check that throughout the text every chemical species is spelled before the correspondent acronym is used.

Page 954 line 6: the wording integration time makes the reviewer think about area integration of the chromatographic peak, consider changing it with preconcentration time.

Section 2.2.4: the reviewer would like this section to be slightly reworked including more details about the multi-concentration calibration. Instead of just saying periodically, a more precise description of this calibration seems to be required. Also, how was the zero air background subtracted? Did you do a measurement of the zero air background after each standard analysis?

Page 960, lines 24-25. Day-to-day variability in the response of HCN appeared to be greater for more aged surfaces coatings than shown in Fig 3. This sentence is not clear, please rephrase.



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Section 3.1.4 – This section needs to be clarified. The multipoint calibration curve was performed over a period of 8 days. Does every data point represent the standard concentration for a certain day (minus the zero air concentration for the correspondent point)? If so, when was the calibration exactly carried out? Were the dates equally spaced? How does this calibration compare to other calibrations during the field campaign? Do calibration curve change for different filaments? It would be very useful to see how the different type of calibrations carried out by the authors compare over the four months of the deployment.

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Interactive comment on Atmos. Meas. Tech. Discuss., 5, 947, 2012.