

Interactive
Comment

***Interactive comment on* “Comparison of aromatic hydrocarbon measurements made by PTR-MS, DOAS and GC-FID in Mexico City during the MCMA 2003 field experiment” by B. T. Jobson et al.**

Anonymous Referee #2

Received and published: 23 November 2009

This is an interesting comparison paper that is well constructed and generally well thought-out. The paper sheds important light on the sampling complications and implications when comparing point sampling to long path sampling.

The paper describes a comparison of three techniques, PTR-MS, GC-FID and DOAS for aromatic hydrocarbon measurements from a site in the Mexico City Metropolitan area. However it is more about the comparison between the DOAS and the PTR-MS since the GC-FID was really used to establish the apparent fidelity with the PTR-MS measurement – perhaps this could be reflected in the title and abstract.

I agree with Reviewer One on the following point: An independent laboratory study

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demonstrates that under well controlled conditions that both the PTR-MS and the DOAS techniques provide similar quantitative results. This is a useful result but it does not demonstrate that either technique is capable of quantifying these components in the ambient atmosphere.

Some more discussion on this issue is needed especially with regard to the large differences that were observed between the PTR-MS and DOAS. I believe that it is likely that spatial inhomogeneities were responsible for a significant part of the overall differences observed but the paper does not clearly establish this as fact. The analysis of data with respect to wind direction indicates that the level of agreement changes somewhat with the wind direction but unfortunately this is not sufficient evidence to attribute all the observed differences. In fact another interpretation of the data would be that based on the data presented, including the wind data, there are unexplained differences in the two techniques for ambient air sampling for which only a part of the observations are explainable from possible spatial and fetch differences.

I agree with Reviewer One in that the humidity dependence of the PTR-MS instrument should be described in more detail.

Other specific comments:

P 19645 – line 19: Should be FIS I believe not FOS

- line 23 – to verify that the data. . .

P 19646 – line 25: PTR-MS, GC-FID, (add comma) a commercial DOAS

P 19646 – paragraph starting with line 24 – paragraph is written poorly, suggest rewriting

P 19647 line 23 – should be VOCs

P 19648 – line 8: The PTR-MS is insensitive not just to light HCs but to all alkanes and other species with proton affinities less than water

P 19648 – line 23 – missing a period after parentheses

- line 24 suggest changing sentence to read: Given their small difference in mass and hence small difference in ion transmission efficiency, the difference in sensitivity between toluene and phenol was attributed to. . .

P 19650 line 13 (suggest (e.g., Jobson et al., 2004)

P 19651 line 15: suggest semicolon after ..will be presented here;

P 19652 line 20: suggest change to: Since the PTR-MS is not isomer-specific. . .

P 19654 line 10 – replace that with than –

P 19658 – line 12 – replace were with where

P 19660 – line 2 – replace that with than

P 19661 – line 17 - . . .when the wind blew from the south

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 19641, 2009.

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