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Atmospheric
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Discussions

Interactive comment on “Partially oxidised organic components in urban aerosol using GCXGC-TOF/MS” *by* J. Hamilton et al.

Anonymous Referee #1

Received and published: 1 May 2004

This paper is a short technical note describing a qualitative organic aerosol analysis of 2 urban samples using comprehensive two dimensional chromatography combined with time-of-flight mass spectrometry (GCxGC-ToFMS). Given the growing interest in the nature and sources of organic particulate matter, this paper is a potentially interesting contribution. The main discussion point is the detection of furans, furanones and furandiones in ambient particles, species that have been reported by Forstner et al., 1997 from smog chamber studies of secondary organic aerosol formation from aromatic hydrocarbons. I would point out to the authors the publication of Greaves et al., 1987 (Atmos. Environ., 21, #12, 2549-2561) who also reported GC-MS measurements of furans and furanones from thermal desorption of ambient particles collected on quartz filters. The debate is whether these species are present as a result of sampling artifacts. Other smog chamber investigations have not observed the par-

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ticle phase furandiones and furanones reported by Forstner. The authors discussion does little to advance or recognize the debate about sampling artifacts. There is also little discussion of the other data presented. For example furan and other very volatile species (i.e. toluene, nonane,) are listed as a typical species found in urban particulate matter. Furan has a vapor pressure of almost 600 torr at room temperature so some discussion is warranted on its presence in the particle phase. As a technical report the discussion needs to be more tightly focused on artifact issues, including the literature that discusses filter sampling artifacts for organics. Overall I would rate the quality of this paper as fair to poor.

Specific Comments

The claim in the abstract of good agreement between measured species in your urban samples and smog chamber experiments is not supported by discussion in the text. What species are you referring to and from which smog chamber experiments have these been observed? This needs to be clarified.

How long was there between collection and analysis of the filters? How were the filters stored or handled?

How cool was the GC injection liner? Can some guidelines be given on the volatility range of organics that can be desorbed from quartz filters at 300 C?

What was the heating rate and maximum temperature of the ballistically heated cold trap? Do you think the ballistic heating could be causing decomposition or rearrangements of oxygenated organics such as hydroxy carbonyls?

How were the group trends lines in Figures 1 determined? Can you explain why there is streaking in the 2D chromatogram (upper left to lower right streaks suggest some compounds are slowly eluting off the polar column)

How do your 2D chromatograms compare to those shown by Welthagen et al.?

Is your claim of a typical o-VOC inventory for London based on your 2 samples collected in October? You can not claim a statistically relevant sampling of London based on 2 samples. Have these species been previously identified in London particles?

Is London urban particulate matter acidic enough for the reactions illustrated by Noziere and Reimer to be significant? Particles obtained from roadside sampling should reflect fresh emissions and be largely composed of soot and organics. Is there any supporting information about the inorganic species to say how acidic the London roadside particles were?

Table 4 has a footnote that states the abundance ratio is Şcalculated from Eq. (8.5)Ť. Where is this equation in the text?

Technical Corrections

The font size for Tables 3,4, and 5 are too small. Use a consistent font size for all Tables.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 1393, 2004.

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