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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Real-time measurements of ammonia, acidic trace gases and water-solubleinorganic aerosol species at a rural site in the Amazon Basin" *by* I. Trebs et al.

I. Trebs et al.

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Reply to specific comments:

In Table 1 a hint can be given for the method diffusion denuder for the AiRRmonia ammonia monitor (http: www.mechatronics.nl) as example for a continuously working and minimized system that uses a much lower air flow and less liquids as the wet annular denuder of Slanina and Wyers, 1994. The rotating wet annular denuder is replaced by a channel system positioned on a Teflon membrane and ammonia selected from the ambient air stream via this membrane into demineralized water. The detection of ammonia is similar to FIA (Wyers et al., 1993). A short description is given in Erisman, J.W., Otjes, R., Hensen, A., Jongejan, P., van den Bulk, P., Klystov, A., Möls, H., Slanina, S. Instrument development and application in studies and monitoring of ambient

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ammonia. Atmos. Environ. 35, 1913-1922, 2001.

Response: - Since the detection principle of the AiRRmonia monitor is comparable to the FIA method, we did not include this in the table. However, for the sake of completeness we will add this technique in Table 1.

The problem of gas phase losses (especially for HNO3) in the inlet system was minimized realizing laminar conditions in the conduit and using appropriate material (polyethylene). A Şworst case scenarioŤ that estimates HNO3 losses for the described experiment to lower as 15 % seams to be realistic.

Response: - Considering a Reynolds number of 4500 indicating the transition of laminar to turbulent conditions in the inlet conduit and a coating of the inner conduit walls with water at high relative humidities during nighttime, we find a Şworst case scenarioŤ of 15 % losses as appropriate.

The major problem with any denuder systems for measurement of nitrous acid is the formation of artifact nitrous acid by reaction of NO2 with S(IV) on basic coatings (here 10-4 M NaHCO3 solution). The fact that the SO2 concentration is very low at the described measurement site (NO2 concentrations are not shown) indicates that this nitrous acid formation is unimportant here. But it would be better to mention this potential interference, described recently: Spindler et al., Wet annular denuder measurements of nitrous acid: A laboratory study. Atmos. Environ. 37, 2643-2662, 2003.

Response: - We have excluded this reference because of the reasons mentioned by the referee; however, to strengthen the accuracy of the HONO measurements performed in our study, we will include this reference.

The addition of a small map to the site description (surroundings of the measurement place) makes these better understandable.

Response: - A map is not included in the paper because it does not explicitly serve for the explanation and interpretation of the results.

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Reply to technical corrections:

Page 1216 line 14 the correct number for the Equation of temperature dependency for the conductivity is Eq. (4) instead of Eq. (6).

Response: - This is not true. The equation of temperature dependency for the conductivity is Eq. (4).

Page 1230 and Table 1 There are two citations as Simon and Dasgupta, 1995 for different papers, it would be better to mark these as 1995a and 1995b

Response: - This will be changed.

Page 1229 The citation Middlebrook et al., 2003 is not used in the text.

Response: - The reference will be deleted from the bibliography.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 1203, 2004.