Atmospheric Chemistry and Physics Discussions

Interactive Comment

Interactive comment on "Polycyclic aromatic hydrocarbons in the atmosphere of two French alpine valleys: Temporal trends and examination of sources" *by* N. Marchand et al.

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General comments

The paper by Marchand et al. presents an interesting data set of polycyclic aromatic hydrocarbon (PAH) measurements in the air of alpine valleys with strong combustion emissions (traffic and domestic heating sources). The discussion and presentation of measurement results and conclusions, however, could and should be improved substantially. Some specific suggestions are given below.

Specific comments

1) The language should be improved throughout the manuscript, i.e. the phrases and

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statements should be formulated in a more precise and scientific way and in correct English vocabulary and grammar (past/present, singular/plural, verbal conjugation, etc.; proofreading by native English speaker).

2) The mean concentration values and standard deviations for every individual PAH investigated in this study should be included in Table 2. Moreover, characteristic and relevant ratios between the investigated analytes (PAH, PM, TC, EC, OC) should not only be addressed in the text but also included in Table 2.

3) The influence and potential effects of gas-particle partitioning of semivolatile PAH should be addressed and discussed in more detail. It is not clear, why FLA and PYR are assumed to be the only semivolatile components among the investigated PAH. I would suggest to perform statistical analyses not only for the sum of measured PAH (Σ) and for the somewhat arbitrarily defined parameter Σ', but also with the sum of (semivolatile) 3-and 4-ring PAH and with the sum of (more or less completely particle-bound) 5- and 6-ring PAH. In this context, it might be useful to adopt the terminology used by Schauer et al., 2003 (Environ. Sci. Technol., 37, 2861-2868, 2003: PAH(3,4), PAH(5,6), PAH(3,6)), instead of the rather unspecific symbols Σ and Σ'.

4) The influence and potential effects of filter reaction artefacts, in particular the efficient oxidation of PAH by ozone and other atmospheric photooxidants should be pointed out and discussed (e.g. Schauer et al., 2003, and references therein).

5) The overview of PAH emission studies, which are only of limited significance for the results and conclusions of the presented investigations, should be complemented by a comprehensive overview and discussion of earlier field measurements of atmospheric PAH concentrations during different seasons and at different geographical locations. In particular, earlier studies of PAH in alpine environments should be taken into account (e.g. Fernandez et al., Environ. Sci. Technol., 36, 1162-1168, 2002; Schauer et al., Anal. Bioanal. Chem., 378, 725-736, 2004; and references therein).

6) Based on a more comprehensive discussion of the measurement results of this

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study and related earlier studies (including the aspects pointed out above as well as in the other comments published in the interactive discussion of this manuscript) the scientific messages and conclusions should be corroborated and made more specific.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 887, 2004.