

Interactive comment on “Comparison of analytical methods for HULIS measurements in atmospheric particles” by C. Baduel et al.

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We thank the reviewer for his thoughtful and detailed review. In our response below, reviewer comments are stated in italics and our response follows.

conclusion is too far reaching (recommending the DEAE extraction), because only two methods were tested. I agree that, according to their results, the DEAE method appears to be superior to the C18-SAX method. However, I would have been glad to see other widely used isolation methods compared, including a method which follows closely the IHSS protocol for humic substances which involves isolation on XAD-8 resin followed by desalting (Dinar et al., 2006; Taraniuk et al., 2007; Duarte et al. 2004; Sannigrahi et al., 2005; etc.).

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We agree with the reviewer that our conclusion strictly applies only to the two methods tested, and modified our conclusion to acknowledge that. A more complete methods intercomparison would be useful, but should be done in a cooperative work between research groups rather than by a single one.

When it comes to actually choosing an extraction method, with the prospect of doing carbon measurement on the extract, which is the scope of this paper, numerous methods prove rather impractical, such as that of Duarte and Duarte. 2005: using methanol as an eluent really complicates the analytical process, as it implies an evaporation step to eliminate the solvent after elution. Because of its impractical aspect, this method has been discarded, even though from the original publication, it can be estimated that the recovery of fulvic acids on XAD8 would be greater than 95

Published methods that do not use carbonated eluents are mainly Decesari's and Limbeck's methods, which we implemented and compared, plus IHSS derived methods, that have been used, as the reviewer points by Dinar et al, Taraniuk et al and Sannigrahi et al, and extensively tested by Sullivan et al. 2006. These tests show a very good recovery SRFA (93

It is now clearly stated in the discussion and the conclusion that our comparison is intended to complement other detailed studies such as Duarte and Duarte 2005 and Sullivan et al 2006, and that the only specific advantage of the DEAE extraction is that of excluding phenolic species from the extract.

There doesn't seem to be a correspondence between the specific absorbance results reported for non-extracted SRFA in Table 4, and those shown graphically in Fig. 2. According to the Figure, the values given in the Table for SRFA (non-extracted) are too low.

Thanks to the reviewer for pointing this to us. Part of the discrepancy came from the fact that the figures in the table correspond to an average over all the specific absorbance data for all samples at a particular wavelength, whereas the graph corresponds to

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the spectrum of one particular extract. There also was some issues in the calculated average for the SRFA specific absorbance at 254 nm. This has been corrected, and the graph's legend has been changed to specify that it is only one particular spectrum versus average values in the table.

Dinar, et al (2006), *Atmos. Chem. Phys.*, 6, 2465–2482.

Duarte and Duarte (2005) *J. Atmos. Chem.*, 51, 79–93

Sannigrahi et al. (2006) *Environ. Sci. Technol.*, 40,666-672.

Sullivan and Weber (2006), *J. Geophys. Res.*, 111, D05314, doi:10.1029/2005JD006485.

Taraniuk et al. (2007), *Geophys. Res. Lett.*, 34, L16807, doi:10.1029/2007GL029576

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