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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Contributions of nitrated aromatic compounds to the light absorption of water-soluble and particulate brown carbon in different atmospheric environments in Germany and China" *by* Monique Teich et al.

Anonymous Referee #1

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This paper is investigating the concentrations of nitrated aromatic compounds (NACs) in aerosols collected in Germany and China during winter and summer seasons. The contribution of these compounds to the light absorption of BrC PM and water extracts was determined and discussed. This paper is scientifically very interesting and important for understanding the contribution of individual BrC compounds to the light absorption properties of atmospheric aerosols. The manuscript is well written and I have only a few major and minor comments.

Major comment 1. UV-Vis spectra of WSOC fractions were recorded from 300 to 800 nm, however, only 370 nm wavelength was used in the present study (to compare the data with Aethalometer measurements). Different aromatic compounds can have different spectra (see Pretsch et al. 2008, Samburova et al. 2016) and thus their contribution to the BrC absorptivity can vary based on wavelength. It would be very interesting to see how eight NACs contribute to the light absorption of aqueous filter extracts over the spectrum range between 300 and 800 nm.

Major comment 2. Did the author compare the absorption properties of PM water extracts at "natural" pH with artificially acidified and alkylated samples?

Minor comments: Abstract, Line 13. Use (NACs: nitrophenols and nitrated salicylic acid) P. 2, Line 26. "in the UV" means in the "UV-Vis range of the spectrum"? P.2, Line 35. Use "BC" instead of "black carbon", since this abbreviation was introduced above (line 18) P. 3, Lines 6-7. References are needed after ". . .absorption at 365 nm is used to characterize water-soluble BrC." P. 3, Line 33. Use "biomass-burning aerosols" P. 3, Lines 41-43. This long sentence is a little confusing. P4, Line 9. Add the period (not "until 31 January") for "the first half of the campaign". P4, Line 41. It sounds a little better, but optional: "Analysis of WSOC, levoglucosan, NACs and UV/Vis spectrophotometry measurements were carried out using aqueous filter extracts of different portions of filter in ultrapure water." P. 10, paragraph 1. Why significant BB absorption was observed at the German sites during winter campaigns (because there are more domestic biomass-burning events)? P. 10, Line 23. Use abbreviation "NPs" P. 10, Line 40. Use abbreviation "NACs" P.10, Lines 35-39. If BB was not the major contributor to the analyzed BrC particles, what was a possible source of BrC compounds? Suggestions? P.11, Line 41. Delete space between 4 and %

Summary: I recommend this manuscript for publication after minor revisions.

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