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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Composition and mass size distribution of nitrated and oxygenated aromatic compounds in ambient particulate matter from southern and central Europe – implications for origin" *by* Zoran Kitanovski et al.

Anonymous Referee #2

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The paper reports on findings from wintertime measurements of composition and mass size distribution of different nitrated and oxygenated aromatics in Mainz, Germany and Thessaloniki, Greece. Correlation coefficients between the concentration of these species and WSOC, HULIS, K+, and nitrate were determined to investigate sources of the observed N/O aromatics. The authors conclude that air masses sampled in Thessaloniki were impacted by fresh biomass burning while aged air masses (biomass and fossil fuel combustion) were sampled in Mainz. There is a lot of information on the total concentration of the various species and their size-dependent concentration, so

there's certainly value to having this information for these two cities (despite the short duration of the measurements). However the way the paper is structured and the use of this many acronyms make the paper very hard to read. The other major comment I have is about the conclusions of the source attributions. For example nitrate aerosols could be high in biomass burning plumes as well as aged urban plumes, so I'm not sure a correlation can be really conclusive. Another support for the source apportionment conclusions is the mass size distributions; however the resolution of these distributions is so low that I don't think they can be robust for such interpretation. The other comments are highlighted below. I recommend major revisions and reconsideration before accepting the paper for publication.

Line 9: what does the index in the summation sign indicate? It's probably the number of NMAHs, but perhaps it's more clear if it's defined for at least one group of compounds first. Line 151: what's the time resolution of the samples in TK? I believe it flows better if section 2.2 is presented in the beginning of Section 2, followed by sample preparation and analytical methods. I also think section 2.1 (Chemicals and Solutions) can be moved to SI. L185: each filter paper or just sections of it? L230: what justifies assuming that measurements at TK were also PM10? The authors later on do comment that perhaps larger than 10 um particles were sampled in TK (the statement on L 328-329). L255-256: name of the country (Slovania and China, etc) shouldn't be in () with the reference. L320: how can the contribution from primary traffic emissions explain the peak in MSD in the 0.95-1.5 um range? Primary emissions are typically peaking in <100 nm in number distribution, which puts the mass distribution peak at much smaller than 0.95-1.5 um. L422: This sentence doesn't make sense. I thought NPYR is a marker for primary combustion; so why is "long range transported pollution" also included here? Despite this, the authors claim that lack of NPYR isomers suggests advection of chemically aged plumes to MZ. Aren't these sentences contradictory?

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