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Atmospheric Measurement Techniques Discussions

Interactive comment on "Ultrasonic Nebulization for the Elemental Analysis of Microgram-Level Samples with Offline Aerosol Mass Spectrometry" *by* Rachel E. O'Brien et al.

Anonymous Referee #2

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This manuscript proposes a new method to determine elemental ratios of microgram-level samples using offline AMS technique. Such technique would be quite useful and valuable, and therefore the paper merits publication. The description, justification and discussion of the technique is overall solid, this reviewer has a few comments for the authors to consider before its publication: (1) The manuscript aims to do elemental analysis, but as shown in the paper, it seems like you can also do mass quantification by using an internal standard. So why only mention elemental analysis? (2) Does the size distribution influence the measured particle composition? Also, for different samples, did you observe different size distributions? (3) Dehumidification is not applied in current experiments (although it can be done as you mentioned), therefore there might

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be extra H2O signals influencing quantification of organics? I think you should add dehumidification procedure. (4) You mentioned there might be significant background signals if organic solvent is used to extract the samples. Did you try to use activated carbon to remove organic solvent? (5) You mentioned the ultrasonic nebulization may increase the temperature of your sample solution. This may lead to evaporation of some organics and therefore the composition and elemental ratios of your analysis. How to avoid this and how to consider such uncertainty? (6) Regarding the comparison of AMS mass spectra determined by SVN and online data, you need to be careful that the difference can attribute to a couple of factors: online measurement is for PM1 and can measure both water-soluble and water-insoluble species, while the SVN only determine water-soluble portion and your samples are PM2.5? (7) Why not use Canagaratna 2015 (Atmos. Chem. Phys. 2015, 15, (1), 253-272.) method to calculate H/C and O/C? Other typos: Line 307 3.1 mass spectral analysis. It is not 3.1 Line 316 atomizer (black) and the SVN (green), the colors are inconsistent Line 323èąŇ offline (red) vs. online (black)ïijŇthe colors are inconsistent

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