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Atmospheric Measurement Techniques Discussions

Interactive comment on "Hyphenation of a EC / OC thermal-optical carbon analyzer to photo ionization time-of-flight mass spectrometry: a new off-line aerosol mass spectrometric approach for characterization of primary and secondary particulate matter" *by* J. Diab et al.

Anonymous Referee #3

Received and published: 8 May 2015

Dear Editor,

this is an interesting paper presenting a new methodology for analysis of carbonaceous aerosols. The structure is clear and the text well written. I have only two main concerns regarding how the novelty of the proposed method is presented: a) it is unclear to me whether the actual methodology (the hyphenation) is actually novel or not, this is unclear in the text; and b) it seems that the main advantage of the proposed technique is

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the identification of fragmentation of species during thermal evolution of the samples, by identifying different species in the different thermal steps. The detection and quantification of single organic species was already available with REMPI and SPI (therefore it is not novel), and the added value of this hyphenation is that this detection may be carried out as a function of the different temperature steps. This seems to be a novel and interesting application (if it is indeed novel), and the paper would benefit from a deeper discussion of this issue, in my opinion. In the current form the paper devotes large sections to results which are interesting although expected (e.g., the high wood burning contributions in winter), whereas the impact of fragmentation and decomposition products is not sufficiently discussed. This could also be discussed from the point of view of literature and existing techniques (if any) which may already do this. In addition, potential limitations of the method (in comparison to existing techniques) should be discussed.

Specific comments:

line 1, abstract: “exposure” should be “characterization”, “discrimination”, . . .

page 273, line 2: “a lot of” should be “numerous”

page 274, line 12: is this the first time that these 2 instruments have been coupled?This is unclear to me. If so, please highlight the novelty.

page 278, line 22: “have” should be “has”

line 27, “230°C”, why was this temperature selected? What is the impact of the temperature difference between the oven (from 140 to 580°C depending on the T step) and the Al box (230°C)? Would this difference not affect condensation or coagulation of gaseous compounds?

page 281, line 9: a word seems to be missing after “desorption of”, should it be “smaller” molecules?

page 282, line 6: please describe the sample conservation procedure for the shipment

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from Hong Kong

page 283, line 8, “organic mass in winter” should be “organic mass in the area studied in winter”

line 14, was the Chow study for the same region? Otherwise I don’t see how both studies can be compared.

page 286, line 8-9, regarding my main comment above: this kind of statement is highly useful for the paper; the authors could add a dedicated section on the specific advantages of the hyphenation in comparison to existing technologies.

line 15-16, same here

page 289, lines 23-26, same here.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 269, 2015.