Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2017-329-RC1, 2017

Atmospheric Measurement Techniques Discussions

Interactive comment on "Field measurements of biogenic volatile organic compounds in the atmosphere using solid-phase microextraction Arrow" *by* Luís Miguel Feijó Barreira et al.

Anonymous Referee #1

Received and published: 18 November 2017

General comments:
This paper describes the performances of SPME Arrow compared with SPME fibers for the detection of BVOCs such as monoterpenes and aldehydes. Kinetics of the extraction, the comparisons of the extraction efficiencies between SPME Arrow and SPME fibers and between coated materials, the effect of temperature and humidity on the extraction efficiency were systematically investigated in the laboratory. Then, the SPME system was tested for the field measurement of BVOCs in forest atmosphere. The dependence of BVOCs concentrations on meteorological parameters such as temperature, humidity, precipitation, PAR, ozone, and PNC was discussed. I feel that the present work was well-organized and that the paper is generally well-written.

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Discussion paper

But there were some parts which I did not understand. Especially, I felt that the discussions in Sec. 3.4 were vague and subjective, and were not based on statics. In the field data, the difference between SPME Arrow (PDMS/DVB) and SPME Arrow (PDMS/Carbon WR) was observed although the data were calibrated. The authors should discuss if some meteorological parameters could cause the difference or not. Therefore, I recommend this paper to be revised considering my specific comments below, before it is acceptable in Atmospheric Measurement Techniques.

Specific comments:
(1) Page 6, Lines 16−17: What is the sampling time? 10-min?
(2) Page 7, Line 2: Does it lead to only "underestimation"? Doesn't it happen to overestimate?
(3) Page 7, Lines 15−24: What is the sampling time and the temperature in the caribration? And which type of SPME was calibrated? In Table S1, the calibration carves for only one type of SPME are listed. Later, field data obtained from all types of SPME were quantified. Therefore, calibration carves for all types of SPME should be shown.
(4) Page 9, Line 4: Is it "the ratio between nonanal and decanal"? I think that the authors did not show the results of nonanal in the laboratory experiments.
(5) Page 9, Line 17−Page 11, Line 5: I felt that the discussions here were vague and subjective, and were not based on statics.
What is the reason of the difference between SPME Arrow (PDMS/DVB) and SPME Arrow (PDMS/Carbon WR) in Figs. 6 and 7?
(6) Page 10, Lines 6−7: What is the reason of the anti-correlation between the measured monoterpenes and PAR?
(7) Page 10, Lines 13−14: This sentence is inconsistent with the previous two sentences. Explain the reason more carefully.
(8) Page 10, Lines 21−22: Is negative effect of RH and precipitation on the amount of aldehydes surely "evident"? Discuss more carefully.

(9) Page 10, Line 26: Insert “not”: ....any correlation was “not” observed... Am I right?
(10) Page 14, Figs. 1 and 2: In the results of SPME Arrow (PDMS/DVB), the values of peak area of α-pinene are larger than those of Δ^3-carene. According to kinetic data shown in Figs. S2 and S3, the values of peak area of α-pinene are smaller than those of Δ^3-carene. Are they consistent?
How were the error bars calculated? Define them.
(11) Figs. S2$-$S7: How were the error bars calculated? Define them.
(12) Fig. S11: The data of meteorological parameters seems to be different from those in Figs. 6 and 7. Is it just a careless mistake?
The title of the left axis should be “ratio”. It should not be “mass adsorbed (ng)”.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-329, 2017.

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