

Dear editor,

We have carefully considered all the comments by the reviewer and improved the manuscript based on them as explained in the following sections.

Yours sincerely,

Heidi Hellén

Answers to the reviewer comments:

The manuscript "Measurements of atmospheric C10-C15 biogenic volatile organic compounds (BVOCs) with sorbent tubes" by Hellen et al., investigates different materials, sampling efficiency and set-up used for measuring terpenoid compounds using sorbent tubes. I find the manuscript important for the scientific community, specifically for the many groups conducting these measurements and for those willing to start them. The manuscript presents several novel aspects, the methods used are robust and presented in an exhaustive way. I highly recommend the manuscript for publication, and only suggest the authors to provide a few more details that could help other researchers to follow the reported procedures:

L. 118. A brief description of the self-packing procedure is presented at the end of the section. Can the authors provide more details about the procedure, amount of the material used, cleaning processes, conditioning times after the tubes have been assembled? This would be a valuable information to add in the SI since many groups are packing the tubes by themselves but procedures may differ between groups. Are there standard methods reported in literature that could be mentioned here?

-The tubes were packed using a gauze loading rig (PerkinElmer) and following the instructions by Perkin Elmer (Technical note: Packing Thermal Desorption Sample Tubes, 2007). First a stainless-steel net was inserted into the grooved end of a tube. The tube was filled with sorbent leaving ~1.5 cm free from the other end of the tube. Using the gauze loading rig a stainless steel net was inserted also into this end of the tube and after that a spring was adjusted into the tube to keep the net and sorbents fixed. The tubes were cleaned following the instructions provided by sorbent producers. Cleaned tubes were analysed before the use to verify that they were free of contamination. We added a reference to the packing instructions into the manuscript (L- 119-120).

L. 147. Did the authors try different desorbing flows and times that could be mentioned here?

- in this study we did not test different desorption flows since used desorption method was found to be efficient

L. 148. For how long was the sample focused into the cold trap?

-we added to the manuscript that tubes were desorbed for 5 minutes (L. 148).

L. 154. Was there a particular set-up used for liquid injections and which repeatability between different injections of the different compounds was achieved throughout a calibration?

-there was no particular set-up. Just a self-constructed system with stainless steel tubing and a T-connector where solution was injected through a septum into the sorbent tube. Repeatability is included into the uncertainty of the method, and is shown for the alpha-pinene, beta-pinene and

toluene in supplement S2. For Tenax TA tubes repeatability was 2-4 % being highest for terpinolene. We added a comment on this into the manuscript (L. 159).

L. 165. Is there any explanation for the behavior of toluene and was this observed also for similar compounds (e.g. benzene and benzaldehyde)?

-yes, there is always some background for benzene, toluene and benzaldehyde in Tenax TA tubes. A possible source could be the breakdown of sorbents.

L. 274. How long was the aging time of the scrubbers?

-aging depends on the scrubber, ozone levels and used flows. In this study stainless steel and $\text{Na}_2\text{S}_2\text{O}_3$ scrubbers were aged for 10 days at an ozone level of ~ 44 nmol/mol in the flows of 0.1 L min^{-1} and 0.07 L min^{-1} , respectively. MnO_2 scrubbers were aged in a flow of humidified air (1 L/min) enriched with 120 nmol/mol of O_3 for 216 h. KI/Cu scrubbers were installed at a French EMEP rural site "Peyrusse Vieille", for the measurement of oxy-VOCs with DNPH cartridges: 2 measurements/week at a flow rate of 1 L/min for 4 hours (from 12h-16h UTC) for one month and a half. The ozone concentrations ranged from 40 to 60 nmol/mol. Ozone removal capacities of the scrubbers have been studied earlier (e.g. Hellén et al. 2012) and should be tested for specific experiments. We added a description on aging processes into the manuscript Table 2.

L. 517. Did the author investigate any O_3 concentration dependency?

-not in this study

Figure 8. How much aerosol mass was loaded on the filter? And how aged was the F used?

We didn't measure the aerosol's mass loaded. The selected filter was used during a one-month field campaign.

SI. S2. Did the authors assume that the chromatograms integration was very good or was this "good" assessed somehow?

-It was not specifically assessed since separation of the peaks was so clear.