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Atmospheric Measurement Techniques Discussions

Interactive comment on "Continuous-flow isotope ratio mass spectrometry method for carbon and hydrogen isotope measurements on atmospheric methane" *by* M. Brass and T. Röckmann

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This paper gives a good description about measuring δ13C and δD of atmospheric methane. It gave a full description for the used technique and the main precautions to keep the instrument working well. First, this technique could be used for small sample sizes specifically for measuring δD which previously required large size samples. Second, high precisions could get using that technique specifically for δD.

Methane is an important greenhouse gas in the atmosphere after carbon dioxide and water vapor. Methane is not only emitted due to anthropogenic sources such as

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biomass burning, fossil fuel and transportation but also from natural sources such as wetlands, lakes, and termites. Measuring the isotopic composition of atmospheric methane δ13C and δD will help us to reduce the uncertainties of estimating methane budgets since each source and sink has a distinct value of δ13C and δD. The technique described by this paper could measure uses small sample amounts (40mL of air) with precision $\pm$0.07‰ for δ13C and 2.3‰ for δD. The following comments may improve the paper to be in a better form

1- In page 2436 line19 and according to Fig.1 for the whole system, MFC2(not MFC3) controls the high flow rate He stream (20 mL/min) that carries the sample gas from the sample loop to the preconcentartion unit. 2- In page 2436 line22 and according to Fig.1 for the whole system, He from MFC3(not MFC2) is a multi-purpose purge flow that is used to keep the ovens, the split interface and the mass spectrometer clean while residual gases are vented behind the GC column. Some more details that are not mentioned and I think it will make this article stronger: 3- The authors mentioned their technique has those advantages such as fast, high precision ,and very good for small size samples but they didn't i- Mention how long does the run take ii- Compare between other references to show their technique is fast and has high precision. 4- The authors mentioned the HSD should keep at LN bath for at least 20 min but they didn't mention exactly How long HSD should be in LN and did they try longer or shorter time and if yes does the reproducibility become much better for time<20 min. 5- In Page 2439, the authors mentioned the HSD is heated up to+70oC, but they didn't mention for how long to transfer. 6- In Page 2441, the authors mentioned the cryofocussing should be heated to 50oC, but they didn't mention for how long.

Generally, the authors write a good paper however it could be in a better form by making another section "Appendix" to preparation steps, cleaning procedure, and all parts of section 2 (excluding2.1, 2.2., 2.3,2.4) and also 13C,D analysis put under results. So the readers will not confuse about the main procedures for preconcentration and cryofocussing.

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