

# ***Interactive comment on* “Technical Note: Inexpensive modification of Exetainers for the reliable storage of trace-level hydrogen and carbon monoxide gas samples” by Philipp A. Nauer et al.**

**Philipp A. Nauer et al.**

philipp.nauer@monash.edu

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**The authors would like to thank both reviewers for their expert assessment of our manuscript. We have now duly addressed all comments and suggestions to the best of our knowledge. Please find our response to RC1 from Anonymous Referee 1 below in bold, with page and line numbers referring to the revised manuscript.**

RC1, Anonymous Referee 1

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## I) General comments

This technical note conveys a solution for field surveys of trace gas fluxes in remote locations requiring the collection of discrete gas samples that are stored for subsequent laboratory analyses. For H<sub>2</sub> and CO in particular, the storage of small volume gas samples in glass vials is impeded by H<sub>2</sub> and CO emissions from butyl rubber septum fitted to caps.

In a first series of experiments, the authors have carefully tested H<sub>2</sub>, CO and CH<sub>4</sub> emissions from different materials and conditioning protocols. Replacement of conventional butyl rubber septum by silicone plug was proven the most efficient approach to reduce background contamination of H<sub>2</sub> and CO. A second experiment has been undertaken to demonstrate performance for long-term (92 days) storage of gas mixtures in modified vials. Stored gas diffusion through silicone was substantially reduced by replacing septum of screwed caps by a stainless-steel bolt and gasket.

Experiments were well conceived, including relevant controls and adequate number of repetitions.

**We thank the reviewer for the positive general assessment of our work. We agree that among the many potential applications, modified Exetainers may be particularly useful for measuring trace-gas fluxes in remote locations.**

## II) Specific comments

- Comparison of H<sub>2</sub>, CO and CH<sub>4</sub> emission rates reported in Figure 2 should be supported by statistical analyses.

**Thank you for this helpful suggestion. We have conducted a linear regression analysis to compare the slopes of each gas and treatment to the control and reference gas. Results are summarised in a new Table S1 in the supporting information.**

- Slope integrating concentration times series in vials presented in figure S1 should be accompanied with standard error to explicitly show variability of reduction or enhancement of trace gas concentration during long-term storage.

**We agree with the reviewer. The respective standard errors of the regression slope have now been added to Fig. S1.**

- I wonder whether stainless-steel should be replaced with nylon bolt in applications involving survey of marine environments (sea brines cause H<sub>2</sub> emissions originating from metal corrosion).

**This is an excellent suggestion, which we have incorporated in the revised manuscript on p11 I236-239. In our specific application of SEs in marine environments, stainless steel was suitable as gas samples could be kept dry and separate from water samples, but this may not always be possible.**

III) Technical corrections

- L91: References are missing.

**Thank you for pointing this out, the missing references have now been included (p4, I98).**

- L221-223: No data is available to support the statement – better to remove the sentence.

**We agree with the reviewer and have removed the statement in question.**

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