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Atmospheric Measurement Techniques Discussions

Interactive comment on "Dynamic-gravimetric preparation of metrologically traceable primary calibration standards for halogenated greenhouse gases" *by* Myriam Guillevic et al.

Anonymous Referee #2

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The manuscript by Guillevic et al. titled "Dynamic-gravimetric preparation of metrologically traceable primary calibration standards for halogenated greenhouse gases" describes the preparation of novel traceable gas standards containing SF6, HCFC-132b, HFC-125, HFO-1234yf, and CFC-13 in air by dynamic means using a permeation device. Many of these compounds are atmospherically important and no traceable reference standards are well established, therefore this is an important publication. The authors discuss the need and uses for these gravimetric standards and compare them to previous calibration scales.

On the whole, the article is well written, with a few minor typos that can easily be

amended. Please see below for my comments and feedback:

Minor changes: For coverage factors and confidence intervals k values should be in italics P1, line 1 remove 'g' from within P3, line 3 add an 'and' P3, line 12 replace 'in' with 'of' P3, line 13 remove end 's' from flasks P6, line 20 transferred 'into' P7, line 2 'checking' P10, line 1 why do you use k = 1?

Comments: In the introduction there is discussion about calibration scales and static point source measurements. It may be worth briefly commenting on atmospheric measurement and sampling of these compounds to highlight the challenges and needs for reference standards. In the introduction you may want to refer to WMO data quality objectives. Emphasise the impact of HFCs etc. on climate forcing and why the dynamically prepared reference standards are so important. One interesting paper is Velders et al. www.pnas.org_cgi_doi_10.1073_pnas.0902817106 Section 2.1 Please give the numeric calibration range. Section 2.4 Describe how equivalent cylinders (e.g. 3&4 or 2&9) were prepared in parallel. Section 3.1 State detection limits (lods). Regarding the stability of the permeation temperature, how critical is this? How can you tell if a sufficiently long stabilisation time has been reached to achieve equilibrium for the permeation device? Does the pressure of the cylinder have an influence? The authors suggest not, however the lower pressure cylinders seem to be more problematic, could this be attributed to wall effects? Surface reactions are mentioned for HFO-1234yf – was performance better in the treated cylinders? Why use stainless steel if dynamically produced standards often show lower values than statically prepared standards for reactive substances? Is your system not Silco treated? Figure 6 is unclear and I recommend removal or overhauling it.

I recommend that this manuscript be published once minor changes have been made. I look forward to seeing the final article.

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