

Dear Prof. Cook,

As requested, I am providing an explanatory document detailing the suggested non-typesetting changes to our manuscript “Technical note: Testing a new approach for the determination of N₂ fixation rates by coupling a membrane equilibrator to a mass spectrometer for long-term observations” (EGUSPHERE-2024-2049) that require editorial approval.

Unfortunately, I have noticed a rounding error in the manuscript that affects the reported accuracy for argon (Ar). This is particularly noticeable when looking at Figure 2. The current rounding results in a wrong and too high error estimate (0.70 % instead of 0.03 %). Therefore, I would like to make the necessary corrections as suggested below, which refer to the abstract, to a sentence in the main text and to Table 2:

Abstract (page 1, line 19, typeset manuscript version 3)

Original text: “Ar (0.70 %)”

Revised text: “Ar (0.03 %)”

Main text (page 5, lines 77-79, typeset manuscript version 3)

Original text: “Due to the lower concentration values, the averaged offset was 0.7 % for Ar, twice as high as that of the other gases (Table 2).

Revised text: “For Ar, the averaged offset was 0.03 %, an order of magnitude smaller than for the other gases (Table 2).”

Table 2 (page 6, typeset manuscript version 3)

Original text:

| Gas | <i>aSD</i> [μmol/L] | <i>rSD</i> [%] | Precision [μmol/L] | Precision [%] | <i>c_{meas}</i> [μmol/L] | <i>c_{sat}</i> [μmol/L] | <i>Δc</i> [μmol/L] | <i>Δc</i> [%] |
|------------------------------|------------------------|-------------------|-----------------------|------------------|-------------------------------------|------------------------------------|-----------------------|------------------|
| ²⁸ N ₂ | 0.15 | 0.03 | 0.30 | 0.05 | 552.3 | 551.2 | 1.1 | 0.2 |
| ³² O ₂ | 0.16 | 0.05 | 0.32 | 0.11 | 292.1 | 291.5 | 0.6 | 0.2 |
| ⁴⁰ Ar | 0.01 | 0.07 | 0.02 | 0.14 | 14.4 | 14.3 | 0.1 | 0.7 |

Revised text:

| Gas | <i>aSD</i> [μmol/L] | <i>rSD</i> [%] | Precision [μmol/L] | Precision [%] | <i>c_{meas}</i> [μmol/L] | <i>c_{sat}</i> [μmol/L] | <i>Δc</i> [μmol/L] | <i>Δc</i> [%] |
|------------------------------|------------------------|-------------------|-----------------------|------------------|-------------------------------------|------------------------------------|-----------------------|------------------|
| ²⁸ N ₂ | 0.15 | 0.03 | 0.30 | 0.05 | 552.3 | 551.2 | 1.1 | 0.2 |
| ³² O ₂ | 0.16 | 0.05 | 0.32 | 0.11 | 292.1 | 291.5 | 0.6 | 0.2 |
| ⁴⁰ Ar | 0.01 | 0.07 | 0.02 | 0.14 | 14.351 | 14.346 | 0.005 | 0.03 |

Additionally, the subscript “0” was missing in Eq. (18) and has now been added as indicated below:

Equation 18 (page 8, typeset manuscript version 3)

Original text: $p_g(t) - p_g(\text{eq}) = [p_g(t) - p_g(\text{eq})] \cdot e^{\left(\frac{-t}{\tau}\right)}$.

Revised text: $p_g(t) - p_g(\text{eq}) = [p_g(t_0) - p_g(\text{eq})] \cdot e^{\left(\frac{-t}{\tau}\right)}$.

Thank you for your attention to these updates. Please don't hesitate to contact me with any questions.

Best regards,
Sören Iwe