

Geochronology Discuss., author comment AC3
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Reply on EC1

Benedikt Ritter et al.

Author comment on "Technical Note: Noble gas extraction procedure and performance of the Cologne Helix MC Plus multi-collector noble gas mass spectrometer for cosmogenic neon isotope analysis" by Benedikt Ritter et al., Geochronology Discuss., <https://doi.org/10.5194/gchron-2021-11-AC3>, 2021

We want to thank the editor Cecile Gautheron for the additional comments and suggestions to our manuscript. In the following we will outline every change made, based on the comments of the editor and where appropriate provide suitable rebuttals.

Firstly, please define the name of redair, sputnik.

- As stated in the manuscript Line 177-178 (revised version) “. ‘Air’ is a reservoir of air at atmospheric pressure and ‘RedAir’ a reservoir of air at reduced pressure.” RedAir = Reduced Air; New in text: ‘(lab-name ‘RedAir’ is the abbreviation of that fact).’
- ‘Sputnik’ is our name for the configuration of the clean-up module, which bears resemblance to the ‘Sputnik’ satellite. New explanation in text: (‘Sputnik’, lab-name, referring to the shape and protrusions of the central manifold and its faint resemblance to the first satellite)

The symbols used in Fig. 1 are standard symbols in Vacuum technology, we now provide explanation for all symbols.

Fig.2: in the original manuscript is now figure 3 in the revised version. We improved the quality of the figure, so that all details can be seen.

Fig. 3: Information to data with larger uncertainties: Fig. 3 (former Fig. 2 in original manuscript) displays all RedAir calibrations measured during the period between March 2020 and December 2020. We added to the manuscript: 'The second measurement period, with the increased uncertainties of the $^{21}\text{Ne}/^{20}\text{Ne}$ ratios, was performed after an extended period of development work for other noble gas isotopes.' Line 330-332

Fig. 4 and 5.: We incorporated the Figures now in the text of the manuscript. Explanations for the abbreviations of the individual noble gas labs are now provided in the figure caption.

--> " Derived $^{21}/^{20}\text{Ne}$ and $^{22}/^{20}\text{Ne}$ ratios of 22 aliquots of CREU-1, including five power step extractions (Table 1), reveal a spallation line of 1.078 ± 0.022 ($\pm 2\sigma$), which is indistinguishable from the published value of 1.108 ± 0.014 ($\pm 2\sigma$; Vermeesch et al., 2015, Fig. 5). The calculated cosmogenic ^{21}Ne abundances from 22 aliquots of CREU-1 (Table 1) all agree within 2σ with their arithmetic mean ($348 \pm 10 \cdot 10^6$ atoms/g; $\pm 2\sigma$);

thus, we may calculate an error-weighted mean: $348 \pm 2 * 10^6$ atoms/g ($\pm 2\sigma$), which is indistinguishable from the published value ($348 \pm 10 * 10^6$ atoms/g; Vermeesch et al., 2015, see Fig. 6)." Line 333-339

Figure Caption 6 (former Fig.5): We added "CGN = University of Cologne, ETH = Eidgenössische Technische Hochschule Zürich, BGC = Berkeley Geochronology Center, SUERC = Scottish Universities Environmental Research Centre Glasgow, CRPG = Centre de Recherches Pétrographiques et Géochimiques Nancy, GFZ = Deutsches GeoForschungsZentrum Potsdam."