

## ***Interactive comment on “Isolation of quartz for cosmogenic in situ <sup>14</sup>C analysis” by Keir A. Nichols and Brent M. Goehring***

**Anthony Jull (Referee)**

jull@email.arizona.edu

Received and published: 29 July 2019

This paper presents some interesting observations about sources of <sup>14</sup>C contamination during sample processing for in situ cosmogenic <sup>14</sup>C measurements. A contamination from the "frothing process" using laurylamine is reported. I think this is an interesting study and deserves publication, however I have a few comments.

1. In lines 150-152, it is stated that the samples are diluted with (presumably dead) CO<sub>2</sub>. In table 2, this appears to be corrected for the dilution, but the values given for <sup>14</sup>C/<sup>13</sup>C appears to be  $8.47 \times 10^{-12}$  to  $3.64 \times 10^{-11}$  which must be incorrect. Modern carbon is about  $10^{-10}$  <sup>14</sup>C/<sup>13</sup>C. The value stated in the paper for the laurylamine is 1.03 times modern (i.e. about  $1.2 \times 10^{-12}$  <sup>14</sup>C/<sup>12</sup>C. for <sup>14</sup>C/<sup>13</sup>C this should be around

C1

$10^{-10}$ ), so even if the sample was 100% the contaminant this would still be wrong. I assume this is some arithmetic error but it needs to be corrected. 2. In table 2, an explanation of the various columns would be helpful. 3. In table 2, a value of  $\delta^{13}\text{C}$  ca. -5 per mil is given. I assume this is of the diluted (not undiluted) gas? 4. The authors also note that the procedure involves adding the laurylamine to acetic acid. Yet, the acetic acid can be either from biogenic or nonbiogenic sources. Was this tested for <sup>14</sup>C? 5. The authors might wish to review the chemistry of this process and the different phases that can form, for example there is a paper by S. Karlsson et al. (2001) Phase Behavior and Characterization of the System Acetic Acid-Dodecylamine-Water, *Langmuir* 17, 3573.

Sincerely, Timothy Jull (reviewer)

---

Interactive comment on Geochronology Discuss., <https://doi.org/10.5194/gchron-2019-7>, 2019.

C2