

Interactive comment on “The contribution of tephra constituents during biogenic silica determination: implications for soil and paleoecological studies” by W. Clymans et al.

Anonymous Referee #2

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General comments:

The paper provides new information on the applicability of standard and less used protocols for dissolution of alkaline-extractable fractions of silica previously referred to as biogenic or amorphous (silica). Such new insights into the usability of different methodologies are sorely needed in biogeochemistry and this paper is well within the scope of Biogeosciences. The paper is also very clear and well written, for which the authors are to be much complimented! The methods used are also adequately described and in general, the authors make conclusions which are substantiated by the data presented. The only reasonably critical comments I have are related to the aspirations of the authors to through this manuscript provide more general guidelines for the use of

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alkaline extractions in determination of bioavailable Si pools. The manuscript provides quite good guidelines for the caveats which are involved in using alkaline extractions for volcanic soils, and some of the general observations can be applied to other samples as well, but I would not call them general guidelines. The same applies to the general impacts of the paper: although it is a well-conducted study and the manuscript is well-written with mostly sound conclusions, the role of volcanic soils is, in a global context, quite small. This does not mean the study should not be published, but it should be kept in mind when phrasing the conclusions and determining the impact it will have.

Specific comments and suggestions:

As the provenance of some of the samples used is “unpublished data/manuscript in preparation”, it would be good to have some description of how these samples were obtained and stored. On page 10, last paragraph (beginning of discussion) you state that you formulate general guidelines for the use of alkaline extractions in soils and sediments: this is slightly over-ambitious, taking into account the nature of your samples. Could you dampen this a bit? On p17 line 534: I agree with what I presume you are trying to say, that some more through knowledge of the mineralogical characteristics of your samples would have been good, but could you please rephrase this sentence? As the reactivity constant is not a standard, I would appreciate having the rationale behind its use outlined in a little more detail.

Please don't abbreviate mineral dissolution shape to MDS, you only use it a few times and it takes time too look it up. Does the slope need a unit?

Would it be possible to define a very pure tephra sample as a standard? Does anything like this exist, or was this a goal of the heavy liquid separation that was not quite achieved?

I agree that pretreatments are dangerous, this section is good!

Figure 1: total alkali silica diagram? Please elaborate a bit, is this a standard?

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