

Interactive comment on “Performance of a corona ion source for measurement of sulfuric acid by chemical ionization mass spectrometry” by A. Kürten et al.

Anonymous Referee #1

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Overall a good piece of work. Most of the following comments are of a 'needs clarification' nature but a few may lead to minor substantive changes.

5296 I-18,19 Nothing personal here, just a general " why has the 'norm' changed to this" statement: Referencing what you know is fine but if previous work had already showed the fact that you are stating, why not refer to the archival study? People like to see that their work is referred to in a fair and substantive manner. 5297 I-3 and other: A matter of style but 'molecule cm⁻³' is a fairly standard concentration unit (pluralized when written as a sentence is fine but should not be pluralized as written above.) I-7

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A few words can be omitted: 'Radioactive sources are used because they...' 5298 I-2 '... works, it is stable and reliable,...' >Should include the standard flows for sheath and sample gas. 5299 I-3,4 Reword to something like: 'It is thought that radicals such as OH remain largely in the sheath flow while ions are drawn into the sample flow.' 5300 I-1. '...moved upstream...' 'shield it from the ion/sample ...' I-15 replace very well with highly. This adverb is disputable: see increase in NO₃⁻ with time in Fig. 4. Thus, '...reproducible within normal variations of ion count rate.' I-17 Were the needles cut off and machined in any way? They look like they are sort of cylindrically 'barbed' in the figure. 5302. I 6 'defined'? what is meant by that? I 12 Do you mean by Our CIMS, the radioactive ion source version? Perhaps use alpha and corona as short abbreviations to these types... A matter of style but the authors overuse we, us and our. The distinction is rarely needed. I-17 Should use past tense here 'was' as past results are discussed. Probably other occurrences also. How do you know linearity above a certain amount of H₂O? This is not shown here yet it is not needed: all that is needed is the comparison between alpha and corona. The results show a good agreement EXCEPT at low H₂O which appears to be a systematic difference between alpha and corona rather than the random difference (+ or - temperature error) alluded to by the authors. As an aside, it is unlikely that the sum of SO₃ and H₂SO₄ will change with H₂O content of the calibration source. Did the authors detect any So₃? Is it possible that it is converted to HSO₄⁻ by reaction with water ligands on the ions? 5303 I 24-6 This is example of over use of 1st person as well as too many words: Tighten this up to read: NO₂⁻18O⁻ (64 u) is used because the signal at NO₃⁻ (62 u) often saturates the detector. Or even parenthetically state the last nine words. 5304 I 10. 'can vary by 50%.' ? What is then meant by the previous claims of stability and reliability? Perhaps a plot of representative alpha data should be included so these relative words can be substantiated.

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 5295, 2010.

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