

Interactive comment on “Atmospheric sulphuric acid and neutral cluster measurements using CI-API-TOF” by T. Jokinen et al.

T. Jokinen et al.

tuija.jokinen@helsinki.fi

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Referee # 2 The authors thank the referee for very useful comments to the manuscript. The manuscript has been carefully read and corrected considering the referees suggestions and comments. Here we give you the answers to the specific comments the referee has pointed out in the manuscript.

Specific comments: 1) We added a more detailed explanation concerning how naturally charged clusters are formed in the atmosphere, P. 31989 (chapter 2.3. Experimental setup and ambient measurements).

2) We have recognised this problem and naturally charged ions will be removed using an ion filter during future measurements. This is mentioned on the manuscript p. 31992

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3) The authors feel that the information of the CI-inlet design is specified in detail in:

Kurtén, T., Petäjä, T., Smith, J., Ortega, I. K., Sipilä, M., Junninen, H., Ehn, M., Vehkamäki, H., Mauldin, L., Worsnop, D. R., and Kulmala, M.: The effect of H₂SO₄ – amine clustering on chemical ionization mass spectrometry (CIMS) measurements of gas-phase sulfuric acid, *Atmos. Chem. Phys.*, 11, 3007–3019, doi:10.5194/acp-11-3007-2011, 2011.

But we improved the description of the CI-inlet in the instrumentation chapter (2.1. Instrumentation), P. 31987

4) This is a very good comment because we did not mention the exact masses of the clusters. The m/z being smaller than the nominal mass is due to mass defect. We corrected the sulphuric acid m/z values from integer masses to exact masses. P. 31990, chapter 3.1. Peak identification, paragraph 2. This should clarify figure 2.

5) a) This is a layout related problem that will hopefully be corrected in the final production of the article. b) The authors feel that there is no reason to assume nitrate ions affect naturally charged ion penetration through the system, thus no extra caution needs to be taken in consideration.

6) We are not assuming the same calibration factor for higher sulphuric acid clusters. Indeed we only give sulphuric acid monomer concentration and all other signals are given in ions/sec not molec/cm³.

7) Other minor comments: 1) We corrected the sentence as requested by the referee. Reference to other cluster spectrometers is given in P. 31986 I. 10 and 11. 2) Spelling has been checked and Weber et al. (1996) has been referred as the referee suggested. 3) Both sides of R1 have been stated now and high signal-to-noise ratio is corrected to low signal-to-noise ratio. 4) Spelling has been corrected.

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