Atmospheric
Measurement
Techniques

Open Access

Discussions

AMTD

Interactive
comment

Interactive comment on "Counting on Chemistry: Laboratory Evaluation of Seed Material-Dependent Detection Efficiencies of Ultrafine Condensation Particle Counters" *by* Peter Josef Wlasits et al.

Peter Josef Wlasits et al.

peter.wlasits@univie.ac.at

Received and published: 11 April 2020

Author's Response to Referee #3

We thank Referee #3 for the critical assessment of our work and the helpful comments. In the following we address the comments point by point:

General: Please use a different method to denote the tuned instrument rather than an asterisk, as this normally implies a footnote. Suggest superscript-'T'

The suggestion will be implemented as stated. All relevant asterisks will be re-

placed by T's (Page/Line: 5/4, 6/19, 7/6, 7/8, 8/5, 8/7, 8/18, 8/26, Fig. 4, Table 3, Table 4 and Fig. 7)

Page 3, line 12: The purities and grades of all of the chemical stocks should be stated, including the solvent used for the BCY solution. Also state the concentration of the BCY solution.

The purity of the used solvent for the BCY solution (water) as well as the concentration of the solution will be added (3/14 and 3/15).

Page 4, line 18: State the method used to generate ozone and control the concentration

An UV lamp was used to generate ozone. The concentrations were not monitored due to previous experiments on the performance of the lamp. The following sentence will be added:

4/19: Ozone was generated using a custom made UV-lamp with adjustable intensity. An intensity/ozone calibration was performed prior to the experiments with an ozone monitor (ThemoFischer Scientific Model i49), suggesting that the ozone concentrations were in the range of 100-500 ppb.

Page 5, line 24: Please do not use the word 'saturates', as this could cause confusion.

In order to avoid confusion, the word 'saturates' will be replaced by the word 'reaches'. The following changes will be made:

5/29: On the contrary, the detection efficiency of the TSI 3789 reaches 1 at

Interactive comment

Printer-friendly version

Discussion paper

about 20 nm.

Page 6, line 5: Is this not related to the particle's solubility rather than polarity?

We suspect that especially in the sub-10 nm size range charge effects might play a crucial role during the activation of seed particles (s. Figure 7 and 8/32). In order to properly include that into our argumentation, we refrained from using the word 'solubility'. Nevertheless, the observed effects are very similar to dissolution processes.

Page 6, line 19: The word 'astoundingly' isn't particularly scientific. Please describe what aspect was unusual or unexpected.

Since the observation is discussed in the following lines, the word 'astoundingly' will be deleted (6/19).

Page 7, line 11: The phrase "The effect of just readjusting temperatures can be clearly seen too by. . ." is very clumsy. Please reword.

The following changes will be made:

7/11: Fig. 6a shows the effect of changing the temperature settings and the inlet flow of the TSI 3776. The effect of just changing the temperature settings is shown in Fig. 6b and Fig. 6c (TSI 3777 and TSI 3789).

Page 8, line 32: Remove brackets around the reported statistic

The brackets will be removed throughout the text (5/17, 5/18, 5/19, 5/24, 6/4 and 8/32).

Page 10, line 6: The statement about the work being performed independently should really come under the competing interests statement. Could the same statement about TSI be extended to Airmodus?

The presented work has been performed without funding from any company. The statement is true for TSI Inc as well as Airmodus Ltd. The related statement will be moved into the "Competing Interest" - Section and Airmodus Inc. will be included.

The following changes will be made:

10/1: Competing interest: All authors declare that they have no conflict of interest. This study was independently performed and was not co-funded by TSI Inc and Airmodus Ltd.

C4