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Atmospheric Chemistry and Physics Discussions

Interactive comment on "New cloud chamber experiments on the heterogeneous ice nucleation ability of oxalic acid in the immersion mode" *by* R. Wagner et al.

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We thank Referee #1 for the careful manuscript reading. Below we will address the individual comments.

COMMENT: I just have some minor suggestions that the authors might consider before publication in ACP: The authors might explain why they chose different preparation procedures for the H2SO4/OA/H2O and the NaCl/OA/H2O aerosols.

ANSWER: The aerosol injection via the two-component jet device has already been used in our previous study of the binary OA/H2O system (Wagner et al., 2010) and proved to be a clean and efficient way to generate sufficient aerosol mass loadings in

the AIDA chamber within 5 - 10 s. This was therefore used as the standard injection technique for the experiments in the H2SO4/OA/H2O system. We also used this technique for an additional experiment in the binary NaCl/H2O system (similar to Exp. 1 of the present study) whose results are not shown in the paper because they closely reproduced the results from Exp. 1 where the ultrasonic nebuliser was used for aerosol injection. During most of the time period when the experiments in the NaCl/OA/H2O system were conducted at the AIDA chamber, a new instrument was tested, namely the Small Ice Detector probe SID3, constructed at the University of Hertfordshire (as also mentioned in Wagner et al., 2010). SID3 was primarily constructed to reveal the morphology of ice crystals down to sizes of about 1 micron. But during the reported measurements, SID3 was also tested at the AIDA chamber as a tool for the shape analysis of large aerosol particles. When using the ultrasonic nebuliser (see Fig. 3 in Wagner et al., 2010), aerosol particles with a somewhat larger median particle diameter are generated which comes closer to the size detection range of SID3. To obtain a consistent set of data, most of the experiments in the NaCl/OA/H2O system were then performed with the ultrasonic nebuliser for aerosol generation. In order not to burden the manuscript with additional minor details, and because no SID3 results are shown, we propose not to mention these details in the revised text.

COMMENT: The sections of the paper are quite long. The authors might consider splitting them up into subsections.

ANSWER: As outlined in detail in our response to Referee #3, we have made improvements regarding the manuscript organisation, including new subsections and new introductory comments before each main section.

COMMENT: An additional column might be added to Table 1 summarizing the main results of the experiments (critical ice saturation ratio, frozen fraction).

ANSWER: Table 1 was intended as a look-up table for the various experimental procedures. Details of our findings are summarised in Table 2, already including the critical

ice saturation ratio. We will add respective columns for the ice-active number fraction of the aerosol population, f_ice.

COMMENTS: Specific/technical comments: Page 29465, line 16: add references to this statement. Figure 9 might be improved by stretching the x-axis and only showing the range up to ca. 4000 cm-1. The position and meaning of the dashed line should be indicated.

ANSWER: Will be done.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 29449, 2010.