

Interactive comment on “Influence of particle size on the ice nucleating ability of mineral dusts” by A. Welti et al.

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General comment

We appreciate the reviewer's corrections to the paper and thank for the proposed improvements. We address the specific points of suggestion below.

Specific comments

1. The reference to figure 8 has been removed.
2. We will rewrite this section of the introduction accordingly.

C1641

3. Reference added.
4. As figure 3 is only the mathematical best fit to the measured size distribution of one dust species presented in order to indicate the problem of multiple charges, it's not appropriate to reference it here.
5. The SEM pictures were made at the EMEZ. <http://www.microscopy.ethz.ch/elmi-home.htm>. We added that.
6. We checked if the positive charges remaining on the dust particles after the DMA influence the condition under which they nucleate ice. We will point this out in the revised manuscript as suggested by the reviewer.
7. Done
8. Done
9. CPC has been spelled out.
10. ZINC is already mentioned in the abstract. But we will repeat the explanation again here, as it is the first time ZINC is mentioned within the following text.
11. We moved these sentences as suggested.
12. The mentioned minimum can also be found for the 800 nm particles of ATD. Error bars have been added.
13. We added "for some of the samples".
14. The spelling has been corrected.
15. The data points for 1% activated fraction of the four particle sizes lie closer together at lower temperatures. Assuming an active side is needed to start ice

C1642

nucleation on a particle at a certain condition, this indicates the presence of an effective active side on the particles independent on particle size. We will reformulate the statement to make this more clear in the revised manuscript.

16. We expect dust particles from the same source and in the same size range to have the same surface properties.
17. Figure 9 depicts the activation spectra of the four different mineral dust species under similar conditions. The nucleation efficiency of the different mineral dusts can be compared.
As mentioned in the text, contact angles have been calculated following the method described in Chen et al. (2008). To discuss the whole procedure is too lengthy.
18. We will change the sequence in the conclusions.

Technical corrections

1. The dust type is now mentioned in the caption.
2. The line is there. We will, however, increase its thickness for better visibility.
3. The mistake in the caption has been corrected.

References

Chen, J., Hazra, A., and Levin, Z.: Parametrizing ice nucleation rates for cloud modeling using contact angle and activation energy derived from laboratory data, *Atmos. Chem. Phys. Discuss.*, 8, 14 419–14 465, 2008.