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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Freezing of water droplets colliding with kaolinite particles" *by* E. A. Svensson et al.

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The paper describes a contact freezing nucleation experiment and its results. There is a shortage of information on this particular mode of ice nucleation in the literature, and I think authors have done great work in order to understand more about this nucleation mode.

I have two comments.

After reading the paper I could not find any satisfactory thermodynamical reason for **how contact freezing occurs**. To explain this freezing mechanism authors have highlighted new references like Suzuki et al. (2007a and b), ruling out earlier hypotheses, and indicated solid-liquid-air interface theory could favor the contact freezing nucle-

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ation. I wonder if the authors would like to discuss more about solid-liquid-air interface theory. Would be nice work to develop ice cloud parameterizations using this theory and experimental results presented in the paper. I suggest authors to have a look at Djikaev and Ruckenstein, 2008 (J. Phys. Chem. A 2008, 112(46), 11677) paper for more theoretical discussion on solid-liquid-interface theory applied to contact freezing nucleation mechanism.

In the present paper it is observed that probability of freezing decreases with increase in temperature, whereas it increases with increase in humidity. I was wondering if authors have any detailed explanation for this observation. This could be important as to know whether temperature or humidity or both variables are important for the contact freezing. Also I could not find at what relative humidity values the experiments are carried out, and how do you measure it.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 2417, 2009.

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Interactive Comment