Interactive comment on “Impact of palmitic acid coating on the water uptake and loss of ammonium sulfate particles” by R. M. Garland et al.

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Received and published: 28 June 2005

We would like to thank Referee 1 for their careful reading of the manuscript and for their thoughtful comments. We have addressed their comment below; their original review is in italics with our response following it.

While this study considers the growth after equilibration (the equilibration time was fixed to 3 mins.), it is reasonable to assume that from a kinetic point of view, the growth rate might be dictated by the film properties (diffusion constant), as shown in other studies. The authors could expand a little on to what degree the changed growth rates could have an impact on CCN processes.
That is true. It has been suggested that the deliquescence relative humidity (DRH) and efflorescence relative humidity (ERH) will not change with the addition of a coating, but rather the timescale for water uptake will change (Barnes 1986; Chuang 2003). Many studies have found that while the DRH did not change, the growth rate decreased dramatically, with a particle taking up to 90 minutes to fully deliquesce (Andrews and Larson 1993; Wagner et al. 1996; Chen and Lee 1999). This decrease in growth rate could thus greatly impact aerosols ability to act as CCN. We have added a brief discussion of this point in the discussion section and have added the following references.

Reference:


Interactive comment on Atmos. Chem. Phys. Discuss., 5, 2047, 2005.