

Interactive comment on “A comprehensive evaluation of water uptake on atmospherically relevant mineral surfaces: DRIFT spectroscopy, thermogravimetric analysis and aerosol growth measurements” by R. J. Gustafsson et al.

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Gustafsson et al. presented a laboratory study of water adsorption on the surfaces of ATD and CaCO₃. Authors applied three independent experimental methods to evaluate the water coverage of the surface.

Authors claim that the aerosol size distributions of calcite and ATD aerosol are bimodal (p.7197-7198). If one takes the parameters of the two peaks for the ATD

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($D_1=61\text{nm}$, $D_2=270\text{nm}$, $\sigma_1=10$, $\sigma_2=31$) and sums these peaks to reconstruct the original spectrum then one gets a very broad peak with only one maximum. So it is not clear how the authors deconvolute such a broad peak into two. This is a critical point since it questions the data shown in Fig.4 and Fig.6.

In lines 20-21 (page 7200) the authors write: "As far as we are aware, this is the first laboratory determination of the hygroscopic properties of mineral dust aerosol". It should be mentioned that Archuleta et al. (2005) published the HTDMA data on hygroscopic growth of Asian dust in ACPD earlier this year. In the discussion to that paper Dr. Demott presented the interesting experimental details on aerosol spray generation from the dust suspension. Also the hygroscopic properties of ATD, generated by dry-dispersion method, were measured by the HTDMA method and published in the may2005 issue of the AS&T journal.

Fig.4 and Fig.6 are mixed with each other. In the text p.7198 "CaCO₃ At 80% RH..growth factor 1.09" while on Fig.4 (according to the caption) $GF(80\%)=1.14$.

Archuleta, C.M., DeMott, P.J., and Kreidenweis, S.M.: Ice nucleation by surrogates for atmospheric mineral dust and mineral dust/sulfate particles at cirrus temperatures, Atmos. Chem. Phys. Discuss., 5, 3391-3436, 2005.

Vlasenko, A., Sjogren, S., Weingartner, E., Gaggeler, H.W., and Ammann, A.: Generation of submicron Arizona test dust aerosol: Chemical and hygroscopic properties, Aerosol Sci. Technol., 39, 452-460, 2005.

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