

Interactive
Comment

Interactive comment on “Homogeneous nucleation rates of nitric acid dihydrate (NAD) at simulated stratospheric conditions – Part I: Experimental results” by O. Stetzer et al.

O. Stetzer et al.

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In answer to the referee's comments:

We will extend the discussion about the WELAS size measurements and add another figure to illustrate this as has been proposed by the 2nd referee. The correction factors for refractive index and counting efficiency have been applied prior to the lognormal fit. The errors are indicated in the new figure. We estimated the error in refractive index to be around 0.02 which results in an error for D_p of about 10 %. The upper limit for the counting error is estimated as 40 % (these will be reported in the final version of the manuscript). The lognormal fit is in agreement with these errors but a complete analysis of error propagation through the fit routine has not been done.

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Interactive Discussion

Discussion Paper

We know of course that NAT was *observed* in the polar stratosphere by the balloon-borne PSC mass spec of Konrad Mauersberger and coworkers and only recently by IR spectroscopy (MIPAS, Höpfner et al. in ACP 2006). However, there is no direct observation of NAD followed by conversion to NAT, to the best of our knowledge. Nevertheless, this mechanism has been considered by several authors as a possible source of NAT. For example, Tabazadeh et al. (Science 2001) suggested this conversion based on the findings in Worsnop et al. (Science 1993), however, their experimental findings only suggest, that HNO₃ vapor pressures over NAD could initiate the formation of NAT on coexisting ice crystals. A direct conversion of NAD into NAT is not mentioned.

The referee is right in suspecting that we cannot make firm conclusions about the conversion of NAD into NAT from our few experiments. We can neither confirm nor exclude such a mechanism. However we may state that, under the conditions of our experiments, the time scale for such a conversion should be larger than about 1 h.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 2091, 2006.

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