

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

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I agree with the reply that comparing data sets are difficult but it has to be done to make progress in a given area, particularly in this area where we are aware of large differences in nucleation rates between MIT and Colorado groups. Science is often improved when points of view or data sets disagree and not always agree. I still insist that the authors do a careful analysis and present error bars on all experimental data shown (measured in this work or work reported by others). Also, error bars must be plotted (as we did in our paper) to show agreement and disagreement between data sets. Also please note that nucleation is a time-dependent process as well and if your

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composition is changing throughout the experiment (as you indicate in your reply), then that composition change should be modeled over time. It is not just the composition at the nucleation point that determines the rate. It is the integral of the composition change during the time the particles were sampled that determines the rates that you have measured. As far as I know the information on droplet composition reported by Salcedo et al. is VERY accurate (the composition is fixed, there is no evaporation involved here and particles were prepared with a fixed composition and kept the same composition throughout the experiment) and I disagree with your statement in the reply indicating that your lab is the only one with direct measurements of composition at the nucleation point. I am certain that the error bar on your composition is quite large as compared to that of Salcedo et al. and the fact that your composition varies during the course of the experiment and you don't account for that variation adds additional error to your composition analysis and the subsequently reported nucleation rates.

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