Atmos. Chem. Phys. Discuss., 2, S184–S185, 2002
www.atmos-chem-phys.org/acpd/2/S184/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Homogeneous nucleation of NAD and NAT in liquid stratospheric aerosols: insufficient to explain denitrification" *by* D. A. Knopf et al.

Anonymous Referee #2

Received and published: 18 June 2002

This paper describes new laboratory measurements of the homogeneous freezing rates of nitric acid/water droplets. The experiments have been done in a manner equivalent to that successfully used in the MIT laboratory, using an additional analytical technique of Raman spectroscopy to determine the chemical nature of the frozen droplets. The information gathered is of extreme importance to determining the rates of solid Polar Stratospheric Cloud formation because the experiments have been conducted at NAD and NAT supersaturation ratios similar to those encountered in the stratosphere. This has not been true in other studies. The paper convincingly shows that the Tabazadeh et al. (Science, 2001) modelling study of these processes is likely to greatly overpredict the rates of solid PSC formation.

I have only a few relatively minor comments on the manuscript which is, for the most part, very clearly written:

1. In the Experimental section, the geometry of the cell which houses the droplets should be described in more detail. In particular, how are the droplets sealed from the atmosphere. 2. What evidence do the authors have that the droplets do not change their composition from their initial values? 3. How many droplets were used? 4. On page 675, the meaning of n* should be elaborated upon. 5. What is the reproducibility of the measurements? How many times was the experiment conducted on droplets of the same composition?

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 669, 2002.