

***Interactive comment on “The HNO<sub>3</sub> forming  
branch of the HO<sub>2</sub>  
+NO reaction : pre – industrial – to –  
present trends in atmospheric species and radiative forcings”<sup>b</sup>***

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As mentioned in the comment of J. F. Müller, the paper of Butkovskaya et al. (2009) reports a parametrisation for the water effect on the nitric acid formation in the HO<sub>2</sub> + NO reaction. The reference of this paper should be added in the paper of Sovde et al. This parametrisation has been derived from experiments carried out at 298 K and 200 Torr, and it is, in principle, strictly valid only at this temperature and this pressure. However, on the basis of unpublished data from Butkovskaya et al., obtained at 298 K, the pressure dependence of the water effect should be rather weak within the pressure range of the troposphere. Therefore the parametrisation of Butkovskaya et al. can

C5228

be used in atmospheric models to calculate the atmospheric composition near the Earth surface. In contrast, similar calculations at higher altitudes of the troposphere, as reported by J. F. Müller in his comment, remains uncertain as far as the temperature dependence of the water effect on the HNO<sub>3</sub> formation in the HO<sub>2</sub> + NO reaction has not been precisely measured.

Reference:

Butkovskaya, N., M. T. Rayez, J. C. Rayez, A. Kukui and G. Le Bras, Water dependence effect on the HNO<sub>3</sub> yield in the HO<sub>2</sub> + NO reaction: Experimental and theoretical evidence, *J. Phys. Chem. A*, 113, 11327-11342, 2009.

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