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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Absolute rate constant and O(^{3}P) yield for theO(^{1}D)+N_2O reaction in the temperature range227 K to 719 K" *by* S. Vranckx et al.

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The authors use a novel kinetic method to determine high-precision rate coefficients k(T) and O(3P) product yields for the important atmospheric reaction O(1D)+ N2O = (products). The results: revise (upwards) the important parameter k(220 K) used to model stratosphere chemistry; reduce overall uncertainties in k(T); revise (down) the possible contribution of the O(3P) product channel.

A few comments / queries:

1) regarding the anomalous k(T) at high T. Could this be a general feature of k(T)for O(1D) reactions? We (Blitz et al. 2004) saw something similar for O(1D)+CO2. Per-

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haps other reactions have not been studied over a large enough range of T?

2) does your cooling cell really work at up to 500 K? If so, could you let us know which fluid you are using?

3) the correlation plot of (per-collision) k vs ionisation potential in Dillon et al. (CPL 443, 2007, page 12) suggests that the smaller values of k for both O(1D) + N2O and CH4 maybe in error. Not sure how much credence to give to such an empirical relationship, but do you have plans to investigate? O3 and H2 are other apparent outliers.

4) you missed a recent publication of k(296 K) from Mainz: ACP 8, 2008, page 1547. (A mere) 2 experiments gave (1.47 +/- 0.08) e-10 cm3 molecule-1 s-1, so in excellent agreement with your more extensive new dataset.

5) you mention a solid line in Fig. 8, though it looks more like a bold dashed line to me.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 8881, 2008.

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Interactive Comment