CORRECTION

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Correction: CO_2 conversion in a dielectric barrier discharge plasma: N_2 in the mix as a helping hand or problematic impurity?

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Correction for 'CO_2 conversion in a dielectric barrier discharge plasma: N_2 in the mix as a helping hand or problematic impurity?' by R. Snoeckx *et al.*, *Energy Environ. Sci.*, 2016, **9**, 999–1011, DOI: 10.1039/C5EE03304G.
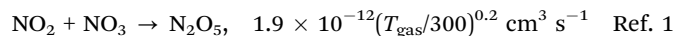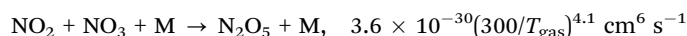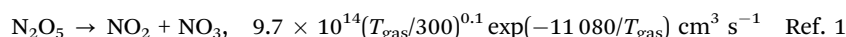
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The use of the reported low-pressure limit rate constants for the reactions $NO_2 + NO_3 + M \rightarrow N_2O_5 + M$ and $N_2O_5 + M \rightarrow NO_2 + NO_3 + M$ (see Section 2.2 of the Supplementary Information) results in a significant overestimation of the rate constants at 1 atm. Therefore, we advise to use the high-pressure limit rate expressions:
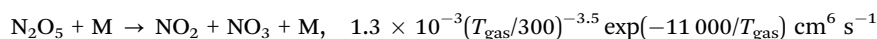
$$NO_2 + NO_3 \rightarrow N_2O_5, \quad 1.9 \times 10^{-12}(T_{gas}/300)^{0.2} \text{ cm}^3 \text{ s}^{-1} \quad \text{Ref. 1}$$

instead of:

$$NO_2 + NO_3 + M \rightarrow N_2O_5 + M, \quad 3.6 \times 10^{-30}(300/T_{gas})^{4.1} \text{ cm}^6 \text{ s}^{-1}$$

and

$$N_2O_5 \rightarrow NO_2 + NO_3, \quad 9.7 \times 10^{14}(T_{gas}/300)^{0.1} \exp(-11\,080/T_{gas}) \text{ cm}^3 \text{ s}^{-1} \quad \text{Ref. 1}$$

instead of:

$$N_2O_5 + M \rightarrow NO_2 + NO_3 + M, \quad 1.3 \times 10^{-3}(T_{gas}/300)^{-3.5} \exp(-11\,000/T_{gas}) \text{ cm}^6 \text{ s}^{-1}$$

Note that these revised reactions are written as: $A + B \rightarrow AB$, but in reality, these are also three-body reactions, hence: $A + B (+M) \rightarrow AB (+M)$. However, the unit for the high-pressure limit corresponds to that of a two-body reaction ($\text{cm}^3 \text{ s}^{-1}$). M is therefore left out of the reaction, to avoid confusion with the unit of the rate constant.

However, the third body is needed, also at high pressure, for conservation of energy and momentum, but the number density of M is no limiting factor, because at high pressure there are sufficient collisions with M. At low pressure, on the other hand, the number density of M will be a limiting factor, and must therefore be accounted for in the reaction rate; hence the need to write it as a three-body reaction.

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.

References

1 R. Atkinson, D. L. Baulch, R. A. Cox, J. N. Crowley, R. F. Hampson, R. G. Hynes, M. E. Jenkin, M. J. Rossi and J. Troe, *Atmos. Chem. Phys.*, 2004, **4**, 1461–1738.

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