### IUPAC Task Group on Atmospheric Chemical Kinetic Data Evaluation – Data Sheet HET\_Org10

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 HO2 + unsaturated functionalized organics  products

Experimental data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | substrate | RH/ % | Temp./K | p(HO2)/ mbar | Reference | Technique/ Comments |
|  |  |  |  |  |  |  |
| *Uptake coefficients*: *γ* |  |  |  |  |  |  |
| < 0.004 | oleic acid | 32 | 293±2 | 4×10-8 | Lakey et al., 2015 | AFT-LIF (a) |
|  |  |  |  |  |  |  |

Comments

 (a) Uptake of HO2 to oleic acid and squalene particles generated by homogeneous nucleation (peak surface area weighted diameter of 84 nm, aerosol surface area up to 10-4 cm2 cm-3). HO2 was generated by the photolysis of H2O in N2 or air and detected as OH (by LIF) following conversion in reaction with NO.

Preferred Values

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | **T/K** |
| *γ* | < 0.004 | 290 – 300 |

Comments on Preferred Values

Uptake coefficients of HO2 to aerosol particles containing unsaturated compounds are lower than those to deliquesced aqueous particles containing dissolved organic components. The single study by Lakey et al. (2015) using liquid oleic acid leads to the preferred upper limit to *γ*. Bulk phase rate coefficients of HO2 with alkenes are too low (in the range of 103 M-1 s-1, Bielski et al., 1985) to drive uptake above the detection limits of the Lakey et al. (2015) study.

# References

Lakey, P. S. J., George, I. J., Whalley, L. K., Baeza-Romero, M. T., and Heard, D. E.: Environ. Sci. Technol., 49, 4878-4885, 2015.

Bielski, B. H. J., Cabelli, D. E., Arudi, R. L., and Ross, A. B., J. Phys. Chem. Ref. Data, 14, 1041-1100, 1985.