

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

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### HO<sub>2</sub> + unsaturated functionalized organics → products

#### Experimental data

substrate	RH / %	Temp./K	p(HO <sub>2</sub> ) / mbar	Reference	Technique/ Comments	
<i>Uptake coefficients: <math>\gamma</math></i>						
< 0.004	oleic acid	32	293±2	4×10 <sup>-8</sup>	Lakey et al., 2015	AFT-LIF (a)

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#### Comments

(a) Uptake of HO<sub>2</sub> to oleic acid and squalene particles generated by homogeneous nucleation (peak surface area weighted diameter of 84 nm, aerosol surface area up to 10<sup>-4</sup> cm<sup>2</sup> cm<sup>-3</sup>). HO<sub>2</sub> was generated by the photolysis of H<sub>2</sub>O in N<sub>2</sub> or air and detected as OH (by LIF) following conversion in reaction with NO.

#### Preferred Values

Parameter	Value	T/K
$\gamma$	< 0.004	290 – 300

#### Comments on Preferred Values

Uptake coefficients of HO<sub>2</sub> 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  $\gamma$ . Bulk phase rate coefficients of HO<sub>2</sub> with alkenes are too low (in the range of 10<sup>3</sup> M<sup>-1</sup> s<sup>-1</sup>, 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.