Supplement of

Retention of α-pinene oxidation products and nitro-aromatic compounds during riming

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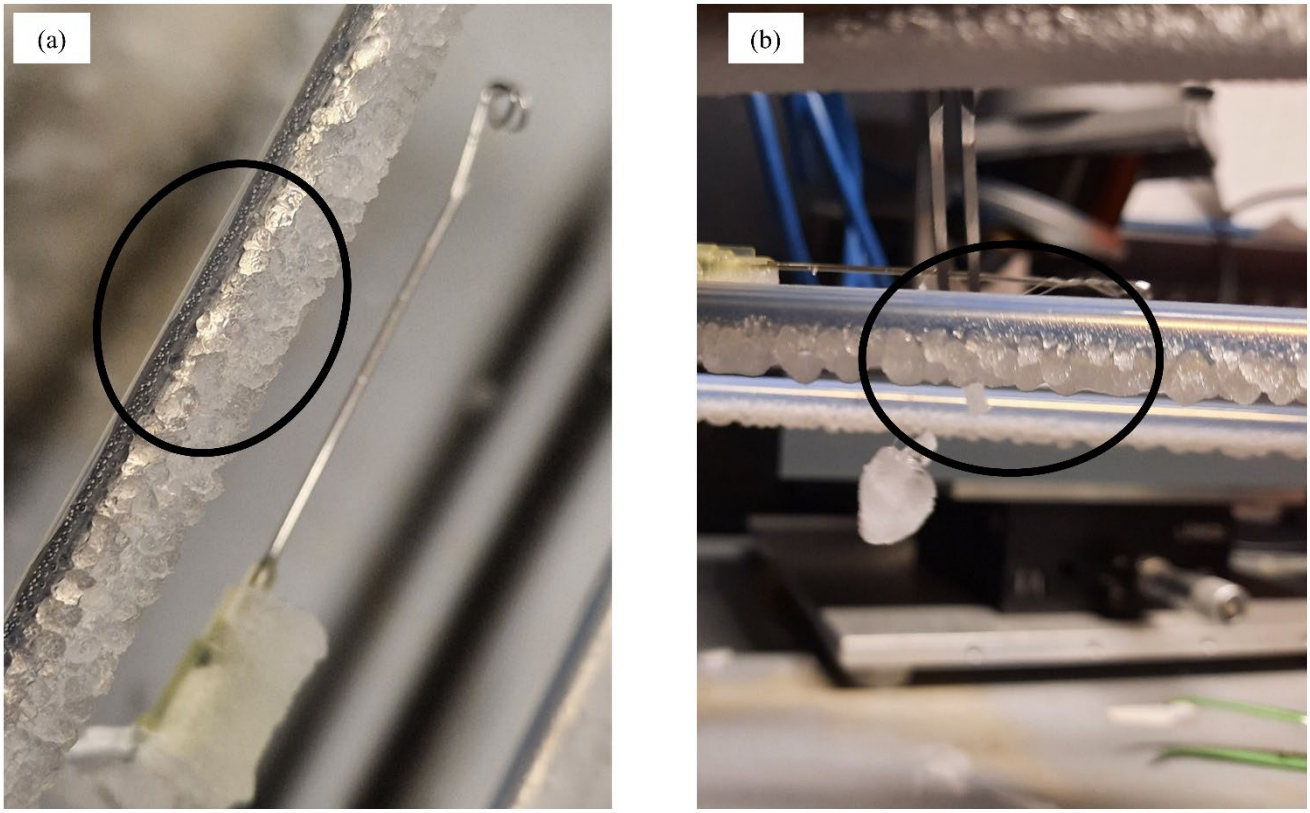
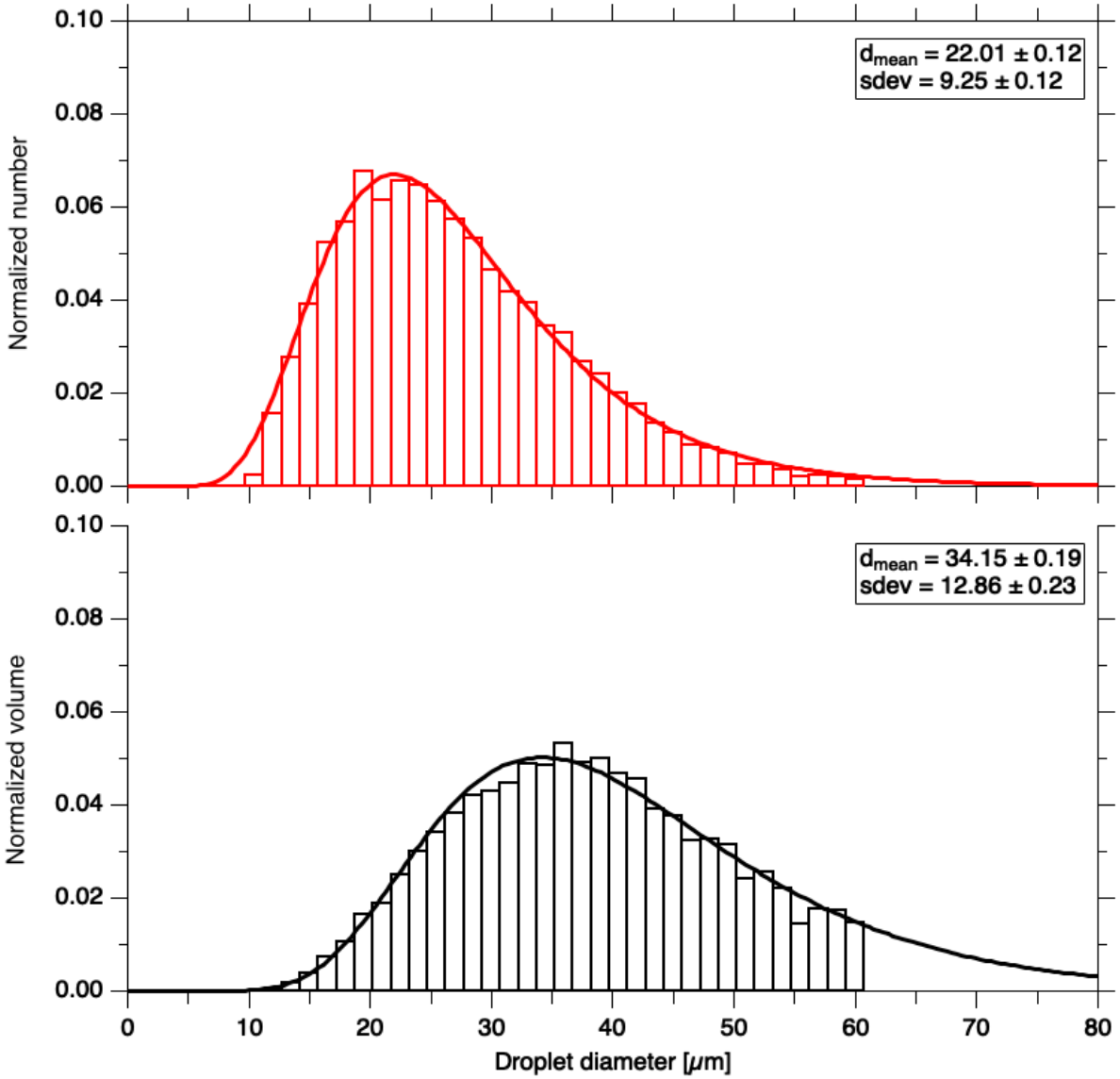


Figure S1: Photo of ice grown under dry (a) and wet (b) growth conditions.



20 **Figure S2: Normalized droplet number (a) and volume distribution (b) of the supercooled droplets generated using four spraying nozzles. The lines represent the log-normal fit functions.**

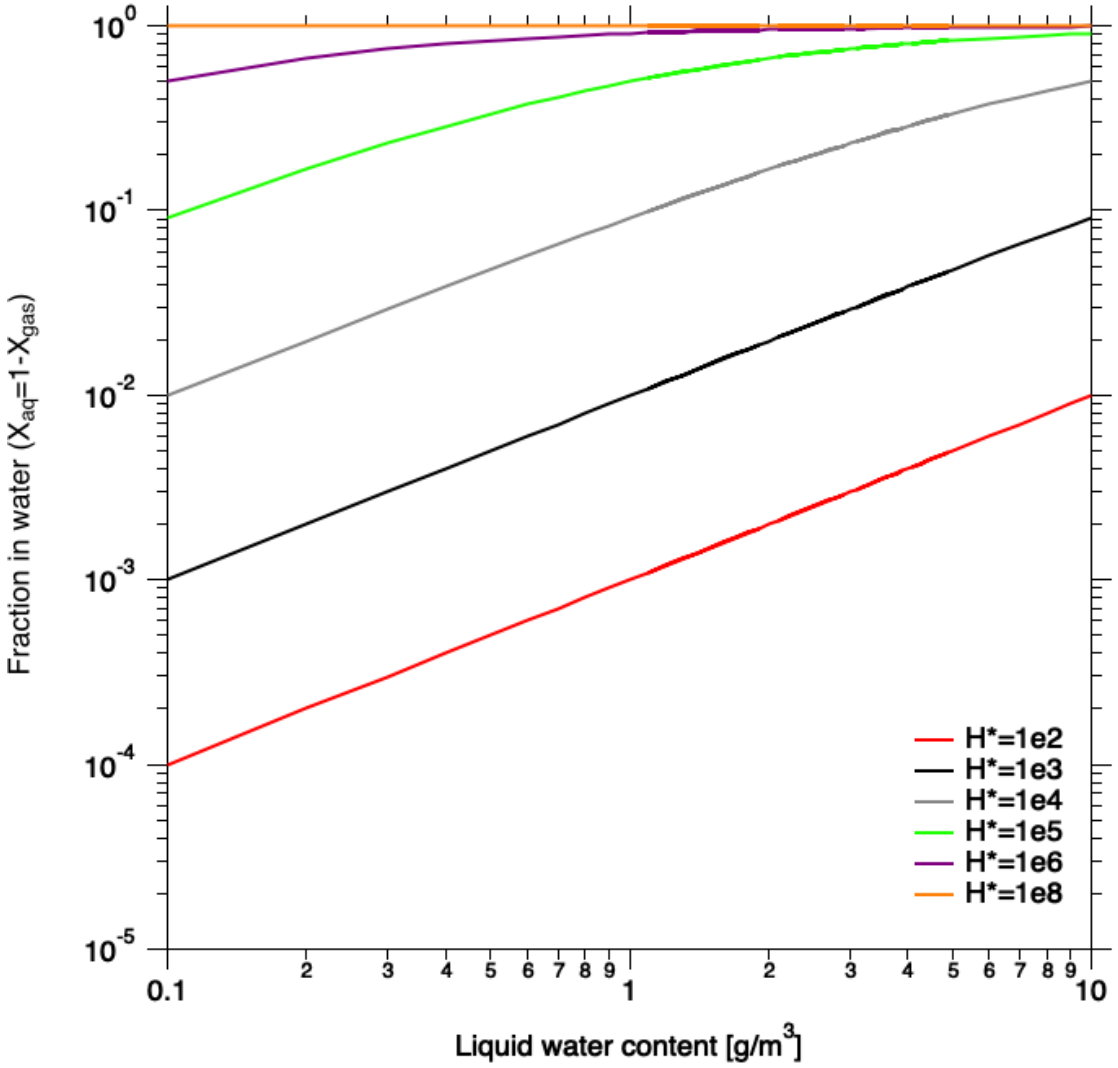


Figure S3: Equilibrium distribution of species between the liquid and gas phase in a confined system as function of the LWC. Figure according to Seinfeld und Pandis (2006).

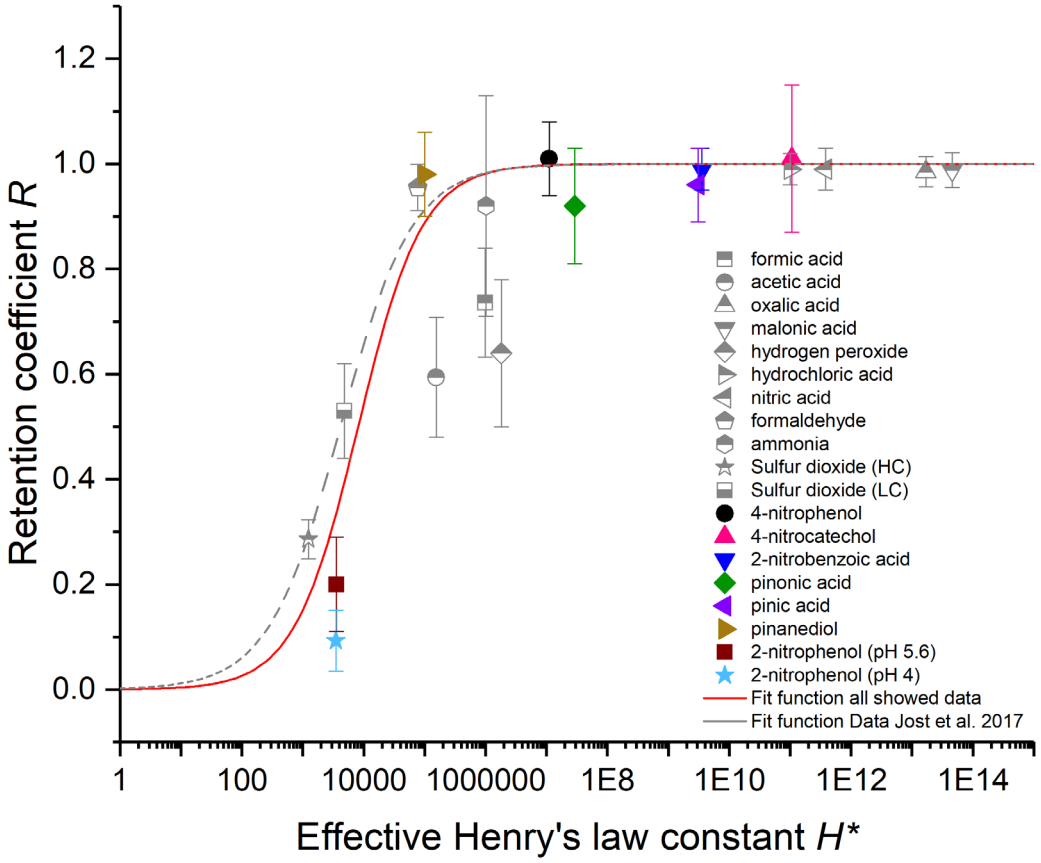


Figure S4: Retention coefficient as a function of *H. Colorful filled symbols: substances investigated in the present study. Grey symbols: wind tunnel data from earlier studies (Jost et al. 2017; v. Blohn et al. 2013; 2011). Fit function: $R_{H^*} = \left(1 + (a\,/\,H^*)^b\right)^{-1}$. Red solid line: new fit to wind tunnel data with all substances ($a_{\mathrm{red}} = (8.10 \pm 2.70) \cdot 10^4$ and $b_{\mathrm{red}} = 0.82 \pm 0.18$). Grey dashed line: fit of only the grey data points $a_{\mathrm{grey}} = (4.15 \pm 1.47) \cdot 10^4$ and $b_{\mathrm{grey}} = 0.74 \pm 0.18$.**

Literature

Jost, Alexander; Szakáll, Miklós; Diehl, Karoline; Mitra, Subir K.; Borrmann, Stephan (2017): Chemistry of riming: the retention of organic and inorganic atmospheric trace constituents. In: *Atmos. Chem. Phys.* 17 (16), S. 9717–9732. DOI: 10.5194/acp-17-9717-2017.

Seinfeld, John H.; Pandis, Spyros N. (2006): Atmospheric chemistry and physics of air pollution. 2nd ed. New York: Wiley.

v. Blohn, Nadine; Diehl, K.; Mitra, S. K.; Borrmann, S. (2011): Wind tunnel experiments on the retention of trace gases during riming: nitric acid, hydrochloric acid, and hydrogen peroxide. In: *Atmos. Chem. Phys.* 11, 11569–11579. DOI: 10.5194/acpd-11-17447-2011.

v. Blohn, Nadine; Diehl, Karoline; Nölscher, Anke; Jost, Alexander; Mitra, Subir K.; Borrmann, Stephan (2013): The retention of ammonia and sulfur dioxide during riming of ice particles and dendritic snow flakes: laboratory experiments in the Mainz vertical wind tunnel. In: *J Atmos Chem* 70 (2), S. 131–150. DOI: 10.1007/s10874-013-9261-x.