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Reactive uptake coefficients for heterogeneous reaction of N_2O_5 with submicron aerosols of NaCl and natural sea salt

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Abstract. The kinetics of uptake of gaseous N_2O_5 on submicron aerosols containing NaCl and natural sea salt have been investigated in a flow reactor as a function of relative humidity (RH) in the range 30-80% at $295\pm 2K$ and a total pressure of 1bar. The measured uptake coefficients, γ , were larger on the aerosols containing sea salt compared to those of pure NaCl, and in both cases increased with increasing RH . These observations are explained in terms of the variation in the size of the salt droplets, which leads to a limitation in the uptake rate into small particles. After correction for this effect the uptake coefficients are independent of relative humidity, and agree with those measured previously on larger droplets. A value of $\gamma=0.025$ is recommended for the reactive uptake coefficient for N_2O_5 on deliquesced sea salt droplets at 298K and $RH>40\%$.

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