



## How organic coatings may suppress the reactive uptake by aqueous aerosols?

T. Anttila, A. Kiendler-Scharr, R. Tillmann, and T. F. Mentel

ICG-II: Troposphäre, Forschungszentrum Jülich, 52425 Jülich, Germany.

Recent experimental evidence indicates that heterogeneous hydrolysis of  $N_2O_5$  in aqueous aerosols may slow down due to a presence of an organic coating. In order to treat comprehensively the mechanisms through which this may occur, an extension of the resistor model, which has been widely applied in investigation of various heterogeneous reactions, was derived. The extension accounts for mass accommodation as well as diffusion and chemical reaction(s) taking place in the organic coating and aqueous phase. Moreover, the developed formalism was applied to explain the observed connection between the rate of  $N_2O_5$  hydrolysis in organic-coated aqueous aerosols and the coating thickness. The coatings were produced through monoterpene ozonolysis and the coating thicknesses, derived from the performed Aerosol Mass Spectrometer measurements, corresponded to that of a few monolayers. In general, thicker coatings lead to smaller values of the uptake coefficient. The analysis showed that decrease in the value of mass accommodation coefficient can not alone explain the observations, but other factors, such as a reduced solubility of  $N_2O_5$  in the coating, are involved as well.