Laboratory and Modelling Studies of Radical (OH, NO3)-Initiated Tropospheric Organic Aqueous Phase Conversion Processes

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Laboratory studies are described which are performed to gain better insight into chemical conversions in clouds and the wet tropospheric aerosol. Results are presented for reactions of OH and NO_3 with organic cloud and aerosol constituents. OH reactions studied focus on C_3 and C_4 compound identified in tropospheric aerosols and clouds. NO_3 reactions have been studied to elucidate possible pathways of nitroaromatic formation in solution processes.
Classes of reactions are discriminated and possible reactivity correlations are outlined. The use of such correlations for extending chemical multiphase mechanism schemes for tropospheric chemistry is discussed.
Model development for tropospheric chemistry will be shortly reviewed and recent results obtained by the application of the aqueous phase chemistry scheme CAPRAM2.4 (MODAC mechanism) in (i) its extended and (ii) a condensed version are presented. Recent work on other versions covering organics beyond C_2-compounds, including an aromatics module, will also be described.
Implications will be discussed and an outlook on further activities in organic tropospheric multiphase chemistry will be given.