Tropospheric Aqueous Phase Chemistry Laboratory and Modelling Studies

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Results from recent photochemical and kinetic laboratory and modelling studies of the formation and reactivity of aqueous phase free radicals such as OH, NO_3, and Cl/Cl_2^- will be presented. Laser-based methods have been applied for the specific generation and time-resolved detection of the above transient species in systematic studies. Photolytic radical generation in solution, radical phase transfer, radical interconversion reactions and the influence of organic compounds on the chemistry within the aqueous tropospheric phase will be discussed. Results indicate that solution reactions of the above radicals may significantly influence the net effects of chemistry within droplets and aerosols dispersed in air.

A multiphase box model coupling an advanced aqueous phase mechanism (CAPRAM 2.4) to RADM2/RACM is applied to quantify effects of multiphase conversions. It will be discussed how aqueous phase processes alter the oxidation capacity of the tropospheric gas phase by uptake of trace gases and radicals. Current restrictions of models will be outlined.