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Abstract Title:

Tropospheric multiphase chemistry - from the lab to the field

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Abstract

Atmospheric chemistry fundamentals are heavily fed by laboratory kinetic and photochemical studies. In the TROPOS ACD aqueous phase chemistry laboratory, such reactions are investigated systematically. Hence, in the first part of the presentation, recent results from these fundamental laboratory studies will be presented and discussed. Systems studied include: (i) Peroxyl radical formation - knowns and unknowns, (ii) the photochemistry of iron-dicarboxylate complexes and (iii) small inorganic radical chemistry - an approach for studying reactions under high electrolyte concentrations.

Fundamental studies must be linked to the real atmosphere. In the second part the so-called Hill Cap Cloud Thuringia 2010 experiments is outlined which has been performed with a number of collaborating groups to study aerosol-cloud interaction with an emphasis on chemical processing in particles and clouds. Selected results of this campaign will be presented and discussed. These results relate to the occurrence of functionalised organic compounds in cloudwater, mass closure and in-cloud processing as well as effects of cloud on gas phase HOx.

Finally, a few thoughts will be presented on how fundamental studies can be better embedded into atmospheric chemistry research and an outlook on the further development of multiphase chemistry as an active field within atmospheric chemistry will be discussed.

