TROPOSPHERIC AQUEOUS PHASE PROCESSES AND GAS PHASE OXIDANT LEVELS

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In this presentation some current issues in aqueous phase chemical processes of importance for the understanding of tropospheric chemistry are discussed. The systems treated here may be referred to as multiphase chemical systems as differentiated from heterogeneous systems. Some chemical sub-systems will be discussed such as (i) sulfur(IV) oxidation and the influence of transition metal ions (TMI), (ii) tropospheric aqueous particle phase organic chemistry and (iii) ionic strength effects. Whereas in the field of cloud chemistry many uncertainties exist, the understanding of deliquescent aqueous aerosol particle chemistry in the troposphere is even less developed. It is suggested to base models for the high ionic strengths in such systems on a combination of the use of activity coefficients (Pitzer) and, in cases where estimates of activity coefficients are not possible because of too little experimental input parameters to apply an ion-pairing model. Many of the experimentally determined primary kinetic salt effects may be explained and, later, be incorporated into combined multiphase cloud and aerosol models. Apart from selected experimental results and concept discussion the outcome of the latest multiphase modelling efforts using CAPRAM 2.4. will be discussed to quantify the influence of tropospheric aqueous phase reactions on gas phase oxidant levels.

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