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Reactivity of the OH-radical towards mono- and dicarboxylic acids in aqueous solution

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Radical reactions can considerably contribute to the transformation and decomposition of organic compounds in the atmosphere. Given the relatively high polarity of carboxylic acids, radical reactions with these compounds will be enhanced in the aqueous phase and at the interfaces of the atmospheric multiphase system. The kinetic investigations contribute hereby to a better understanding of decomposition reactions in the atmosphere. These processes are of interest because they can influence the acidity of the aqueous phase and the particle formation in the atmosphere. The kinetic investigations were carried out with a laser photolysis long path absorption set-up. Rate constants were measured with a competition kinetics method. Furthermore, the influence of the temperature and the pH on the rate constants was studied.

The kinetic data obtained will be presented and discussed. The results for the neutral and the dissociated form will be compared. Contributions from different reaction mechanisms to the obtained rate constants will be discussed with the help of reactivity correlations. Additionally, the obtained data and correlations can be used for modelling purposes of atmospheric chemical processes in the aqueous phase.