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Influence of the ionic strength on radical reactions in aqueous solution

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Radical reactions are important sink processes for the degradation of organic compounds in the atmosphere. These reactions take place in all phases of the tropospheric multiphase system as well as at the interfaces. However, while the reactivity of atmospheric radicals (e.g. OH, NO_3 and halogenated radicals) in the gas phase is well investigated, the reactions in the aqueous phase are not so well understood. Especially the knowledge about salt effects on reaction rates is still limited [1,2]. Since the ionic strength of the atmospheric aqueous phase can vary strongly [2], it is necessary to understand these effects for a more precise modelling of atmospheric processes. Using a laser-photolysis-long-path-absorption (LP-LPA) set-up, rate constants for the reactions of different atmospheric radicals with oxygenated organics (alcohols, carbonyls and phenols) in aqueous solution have been measured as a function of the ionic strength. Different ionic strengths were adjusted by adding variable amounts of sodium perchlorate ($NaClO_4$) to the solution. The kinetic results obtained and literature values will be presented, compared and discussed.

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