

# Laboratory studies on the oxidation of small organics in aqueous solution by OH radicals

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Small organic compounds, such as acetone, are emitted by a variety of natural and anthropogenic sources in the atmosphere. The degradation or transformation of these compounds can occur, in the gas phase and in the liquid phase (cloud droplets, fog, rain or hygroscopic particles) of the troposphere. A special role plays the OH radical, which is one of the most reactive radicals in the atmosphere. The objective of this work is to identify and characterize the various transient species formed in the oxidation of small organic compounds by the OH radical. This characterization is necessary to measure rate constants of elementary reaction steps in the course of the degradation process. The spectroscopic and kinetic information obtained will allow a better understanding of the atmospheric fate of organic compounds. In order to characterize the optical properties of the formed transient compounds (e.g. organic peroxy radicals) a laser photolysis long path absorption apparatus coupled with a CCD-camera / grating combination is used. With this technique time resolved spectra (at different delay times after the excimer laser pulse) of the reactants and products can be recorded. Within this contribution organic peroxy radical spectra of the following parent carbonyl compounds (a) acetone, (b) hydroxyacetone and (c) methylglyoxal will be presented, discussed and compared with literature data. OH radicals were generated directly in the reaction cell by the photolysis of hydrogen peroxide ( $\text{H}_2\text{O}_2$ ) at  $\lambda = 248$  nm. All reactions were studied at  $T = 298$  K in the aqueous solution.