



Photochemistry of iron(III)-dicarboxylic acid complexes in aqueous solution

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Photochemistry of organic iron-complexes plays an important role in aquatic systems like rivers, lakes and oceans, but also in cloud droplets and deliquescent particles in the atmosphere, as a source for radicals and the redox cycling of iron. These processes are important for the bioavailability of iron as an essential micronutrient for organisms and ecosystems. Radical production is important for the decomposition and transformation of a variety of chemical compounds. In the atmosphere these processes are often progressing through radical chain reactions. Until now, mainly the iron-oxalate system has been studied intensively [1, 2, 3], whereas only few studies exist for other ligands. Within the present work, a series of other environmentally important organic ligands is investigated.

First, UV-VIS-absorption spectra of iron-dicarboxylic acid complexes have been measured to investigate their light absorption features. Furthermore, photolysis experiments were performed to quantify radical production and quantum yields. An excimer laser operated at wavelengths of 248 nm and 308 nm served as photolysis light source. The photo-bleaching of the solution was measured spectroscopically with a deuterium-lamp as analytical light source in a reaction cell with quartz windows. A diode-array combined with an image amplifier served as detection system. Quantum yields have been calculated with the measured energy of the excimer laser pulse and the initial concentration of the iron-complexes obtained by a speciation program. The measured data will be discussed.

[1] Y. G. Zuo and J. Hoigne, *Environ. Sci. Technol.*, **1992**, 26, 1014.

[2] B. C. Faust and R. G. Zepp, *Environ. Sci. Technol.*, **1993**, 27, 2517.

[3] Y. G. Zuo and J. Hoigne, *Atmos. Environ.*, **1994**, 28, 1231.