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# Molar Absorptivity and Quantum Yield of Fe(II) Photo-formation for the Aqueous Solutions of Fe(III)-Dicarboxylate Comlexes

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Fe(III)/Fe(II) cycle in the environment affects formation of active oxygen species such as hydrogen peroxide and hydroxyl radicals, which in turn determines lifetimes of many organic compounds. Although aqueous Fe(III)-dicarboxylate complexes are considered to be an important source of photo-chemically formed Fe(II), molar absorptivity and quantum yield of Fe(II) formation for individual species are not well understood. The Visual MINTEQ computer program was used to calculate the equilibrium concentrations of individual Fe(III)-dicarboxylate species in the aqueous solutions of Fe(III)-dicarboxylate complexes. The molar absorptivity and the product of the quantum yield and the molar absorptivity of Fe(III)-dicarboxylate species were obtained by UV-VIS spectrophotometer and photochemical experiments, and these experimental data were combined with the calculated equilibrium Fe(III)-dicarboxylate concentrations to determine individual molar absorptivity and quantum yield of Fe(II) photo-formation for a specific Fe(III)-dicarboxylate species. Dicarboxylate compounds studied were oxalate, malonate, succinate, malate, and phthalate.