Kinetics of the Oxidation of *L*-Cysteine by *trans*- and *cis*-Cobalt(III) and Iron(III) Complexes

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Kinetics of oxidation of *L*-cysteine by pairs of *trans* and racemic *cis* isomers of cobalt(III) and iron(III) based transition metal complexes have been studied in aqueous solution. Kinetics measurements were run under *pseudo* first order conditions in which the concentration of cysteine is between one and two orders of magnitude greater than that of the isomers of the transition metal complex. The orders of the reaction with respect to both cysteine and the isomer were determined.

The observed rate constants and the overall rate constants of the oxidation process were measured. For all geometrical isomers, it was found that the rate constant of oxidation of *L*-cysteine by the *trans* isomer is between one to three orders of magnitude greater than that by the *cis* isomer. The difference in rates can be explained by a geometric factor around the metal ion center in the complex. The less crowded isomer (*trans*) makes electron transfer easier and hence facilitates the oxidation process which leads to a higher oxidation rate.

Key words: Co(III), Fe(III), Kinetics, Cysteine