

Abstrakt v angličtině

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmacology and Toxicology

Candidate: Lucie Pohanová

Supervisor: Assoc. Prof. Přemysl Mladěnka, Pharm.D., Ph.D.

Title of Thesis: Chelation of ferrous ions by xanthen-3-one derivatives

Iron is an essential element important for proper function of cells. Imbalance of iron levels can lead to serious diseases. Since there is no excretory mechanism, the homeostasis is regulated at the level of absorption in the intestine. The iron overload, which leads to tissue damage due to catalysis of the formation of free radicals, occur because of genetic disorders such as hemochromatosis or owing to frequent administration of transfusions. Rational therapy for iron overload is the administration of the chelators.

The aim of this study was to evaluate the ability of derivatives of 2,6,7-trihydroxyxanthen-3-one (synthesized at the University of Sarajevo - Dr. Durić) to chelate iron in 4 (patho) physiologically relevant pH conditions. The ferrozine spectrophotometric method was used to determine the degree of chelation.

Measurements showed dependency of the chelating effect on pH: lowering pH resulted in the decrease of the effect. At pH 7.5, most of the substances showed 100% ferrous ion chelation in the stoichiometric ratio of 1 : 1. In the case of pH 6.8, the chelating effect of all substances was weaker, highest efficiency had 4'-dimethylamino and 4'-trifluoromethyl derivatives. At pH 5.5 the formation of complexes with most substances decreased by a half. At pH 4.5 the chelating ability was greatly reduced.

The results indicate that the derivatives 4'-dimethylamino and 4'-trifluoromethyl proved to be the most effective at high pH. In contrast, it can be said that there was no huge differences in the chelation due to the modification of substituents on the 9-aryl ring of 2,6,7-trihydroxyxanthen-3-one.