ABSTRACT

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Title of diploma thesis: Chelation of copper ions by thiol containing chelators

Copper is an essential trace element that is important for many physiological functions. On the other hand, disruption of copper homeostasis associated with its elevated level is dangerous for the organism, because of the formation of free radicals. Copper chelators can represent an effective tool in the treatment of such conditions. Due to the ability of a thiol group to bind metal ions and form a chelate, thiol containing chelators are promising compounds for the reduction of copper levels.

Within this diploma thesis, four compounds containing a thiol group were tested for the ability to chelate copper ions. Spectrophotometric measurement was used for this determination. It is a simple, fast but precise method for determination of the chelation properties *in vitro*. In addition, the ability of these compounds to reduce cupric ions was examined.

When using the basic hematoxylin method, all the tested substances proved they can chelate copper. Their efficacy was practically identical except for the N-acetylcysteine, which was a weaker chelator. According to the more competitive bathocuproin method, however, none of the tested substances was very potent copper chelator. Chelating properties of N-acetylcysteine were even not observed. The chelation by other three compounds did not reach 100% even at the highest concentrations, the complexes were unstable and, in addition, the reduction potential was proved in all four tested substances. In conclusion, according to these results, the clinical use of these substances in chelation of copper excess is not probable.