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SUPEROXIDE DISMUTASE MIMETIC ACTIVITY OF MONONUCLEAR COPPER (II) COMPLEX OF THE ANTIINFLAMMATORY DRUG NAPROXEN WITH 3-PYRIDYLMETHANOL

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It is well known that copper (II) complexes of the anti-inflammatory drugs are more active than the parent drugs themselves. The majority of clinically useful non-steroidal antiinflammatory drugs (NSAIDs) are carboxylic acids. The sodium salt of naproxen (6-methoxy- α -methyl-2-naphthaleneacetic acid) is one of the most potent of the clinically used NSAIDs and believed to act through inhibition of prostaglandin biosynthesis and like other anti-inflammatory drugs.

The possible medical uses of copper (II) complexes of the anti-inflammatory drugs in the treatment of many diseases such as inflammation and cancer may be based on the ability of the complexes to inhibit DNA synthesis. Another possible mechanism of action of copper (II) complexes involves the scavenging of superoxide anion. Normally, the metalloenzymes superoxide dismutases (SODs) catalyze the dismutation of superoxide anion to hydrogen peroxide and molecular oxygen, and protect the living organisms against several diseases, such as tissue inflammation and cancer, in which superoxide anion appears to play an important role. The clinical use of SODs is limited because of low membrane permeability, solution instability and cost of production. So considerable efforts have been made in order to obtain stable, an inexpensive and low molecular weight biomimetic molecules which are able to catalyze the dismutation of superoxide anion and therefore to provide therapeutic applications. Herein we report the synthesis, molecular structure and SOD mimetic activity of monomeric *trans*-bis (naproxenato) bis (3-pyridylmethanol) copper (II). In the complex the copper ion is essentially in a square-planar environment consisting of two pyridine nitrogen atoms and a carboxylate oxygen atom from each naproxen ligand. The second oxygen atoms of the carboxylate functionalities are involved in weak interactions with the copper ion.

The SOD mimetic activity of the complex has been measured using the indirect xanthine-xanthine oxidase-nitroblue tetrazolium method and compared to that of sodium naproxen and to the native Cu,Zn-SOD enzyme. The activity of the monomeric copper complex is about 10% of Cu,Zn-SOD and about 1000 times higher than that of sodium naproxen.

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