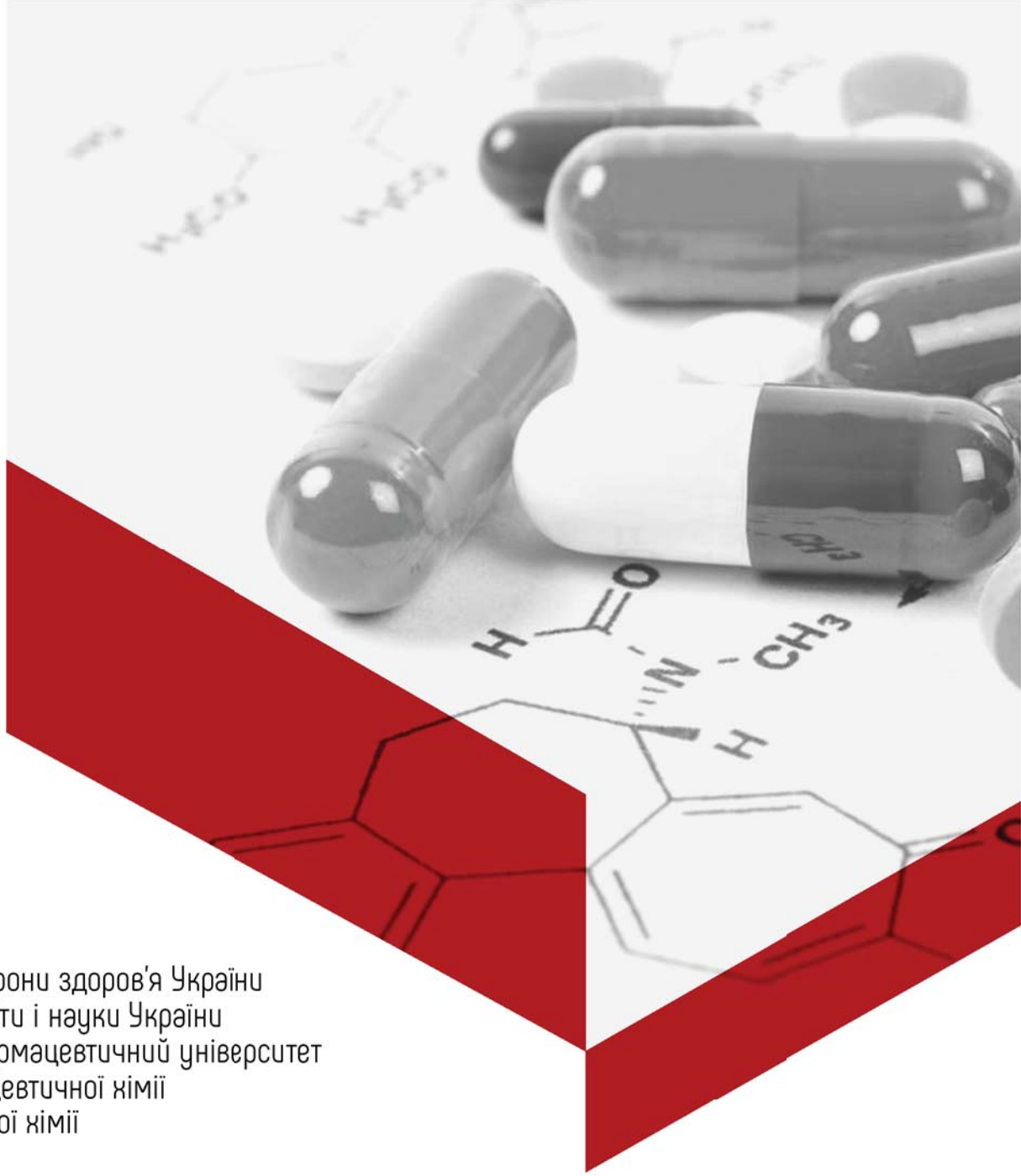

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Antioxidant activity of some 3-(5-mercapto-[1,3,4]oxodiazole-2-yl-methyl)-5,7-dimethyl-3*H*-thiazolo[4,5-*b*]pyridine-2-ones

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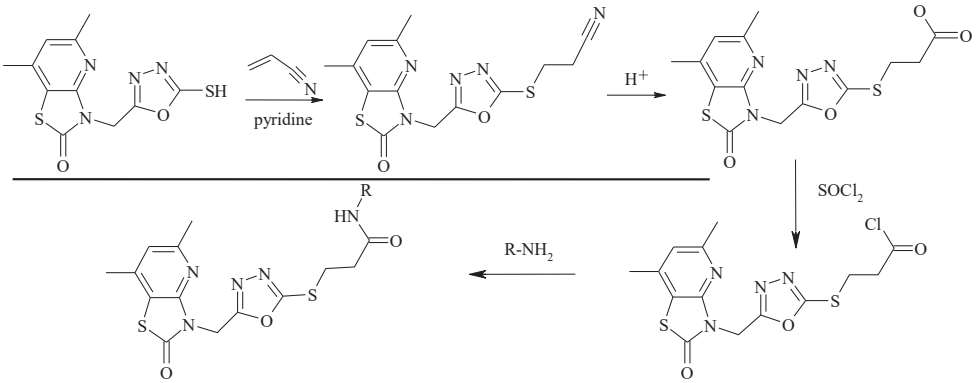
Introduction. Nitrogen-based heterocycles are an extremely important class of organic substances widely used in medicinal chemistry, since more than 60% of drugs and more than 85% of biologically active substances described in the literature contain a Nitrogen-containing heterocycle in their structure. The objective of the present study was to synthesize some novel antioxidant agents via a structural modification of early obtained 3-(5-mercapto-[1,3,4]oxodiazole-2-yl-methyl)-5,7-dimethyl-3*H*-thiazolo[4,5-*b*]pyridine-2-one for further pharmacological screening in vitro as antioxidants.

Results and discussion. For broadening the scope of mercapto substituteds thiazolo[4,5-*b*]pyridines, we involved 3-(5-mercapto-[1,3,4]oxodiazole-2-yl-methyl)-5,7-dimethyl-3*H*-thiazolo[4,5-*b*]pyridine-2-one into cynoethylation reaction taking the advantage of the good leaving hydrogen atom property of the SH-group. It is established that the most optimal conditions for the introduction of the β-cyanoethyl fragment on the base scaffold thiol group consists of the interaction of 3-(5-mercapto-[1,3,4]oxodiazol-2-yl-methyl)-5,7-dimethyl-3*H*-thiazolo[4,5-*b*]pyridin-2-one with acrylonitrile in a pyridine-water medium at a ratio of 5:1, this made it possible to obtain the corresponding 3-[5-(5,7-dimethyl-2-oxothiazolo[4,5-*b*]pyridin-3-ylmethyl)-[1,3,4]oxodiazol-2-ylsulfanyl-propionitrile. Obtained through the mentioned above reaction compound was subjected to hydrolysis leading to 3-(5-hydroxy-7-methyl-2-oxothiazolo[4,5-*b*]pyridin-3(2*H*)-yl) propanoic acid formation. For carboxyl group transformation, the corresponding chloranhydride, which belongs to unstable highly reactive reagents was obtained, so its application in further transformations was carried out without isolation by introducing aromatic amines acylation. The above conversion allowed to obtain a number of suitable propionamides.



The antioxidant activity of the synthesized compounds was measured *in vitro* by the method of scavenging effect on 2,2-diphenyl-1-picrylhydrazyl (DPPH) radicals. The present results of antioxidant activity have shown that the synthesized compounds demonstrated considerable antioxidant effects. Further optimization of the structure to improve biological activity is currently in progress.

Conclusions. A series of thiazolo[4,5-b]pyridine-2-ones possessing antioxidant activities were prepared by the structural modification of the core heterocycle. When compared with existing antioxidants, some our compounds were found to be more potent. Thus the core fused heterocycle may be considered as a promising scaffold for antioxidant drug candidates development.