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SYNTHESIS, STRUCTURE, AND BIOLOGICAL ACTIVITY OF COPPER COORDINATION COMPOUNDS OF SUBSTITUTED PYRIDINE-2-CARBALDEHYDE 4-(*o*-, *m*-, *p*-METHOXYPHENYL)THIOSEMICARBAZONES

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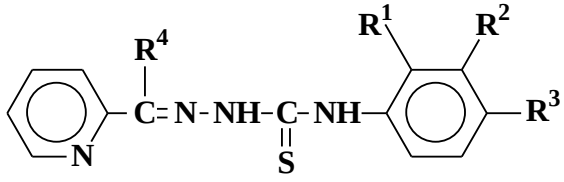
It is known that many thiosemicarbazide derivatives possess biological activity and so are widely used in medical practice for the treatment of infections that are caused by various microorganism. Many of these substances are able to form coordination compounds with transition metals. Many of these coordination compounds are also biologically active. This property allows their use as a base for preparations that can be used in biochemistry and pharmacology. Therefore, synthesis and study of new biometal coordination compounds with thiosemicarbazide derivatives are of both scientific and practical interest.

The aim of this work is the synthesis, determination of the composition, structure, physicochemical properties, and biological activity of copper coordination compounds of 2-formyl- (HL^{1-3}), 2-acetyl- (HL^{4-6}), and 2-benzoylpyridine (HL^{7-9}) 4-(o-, m-, p-methoxyphenyl)thiosemicarbazones.

Thiosemicarbazones HL^{1-9} were obtained by the reaction of condensation:



HL^{1-9}

HL^1 : $R^1 = OCH_3$, $R^2 = R^3 = H$, $R^4 = H$;
HL^2 : $R^1 = R^3 = H$, $R^2 = OCH_3$, $R^4 = H$;
HL^3 : $R^1 = R^2 = H$, $R^3 = OCH_3$, $R^4 = H$;
HL^4 : $R^1 = OCH_3$, $R^2 = R^3 = H$, $R^4 = CH_3$;
HL^5 : $R^1 = R^3 = H$, $R^2 = OCH_3$, $R^4 = CH_3$;
HL^6 : $R^1 = R^2 = H$, $R^3 = OCH_3$, $R^4 = CH_3$;
HL^7: $R^1 = OCH_3$, $R^2 = R^3 = H$, $R^4 = C_6H_5$;
HL^8 : $R^1 = R^3 = H$, $R^2 = OCH_3$, $R^4 = C_6H_5$;
HL^9 : $R^1 = R^2 = H$, $R^3 = OCH_3$, $R^4 = C_6H_5$.

This thiosemicarbazones react with copper(II) salts forming coordination compounds $[Cu(L^{1-9})X]\cdot nH_2O$ ($X = Cl^-$, Br^-, NO_3^-, CH_3COO^- ; n = 1–3). Composition and structure of these compounds were determined on the basis of data from elemental analysis, magnetochemical research, and IR spectroscopy.

The synthesized compounds selectively inhibit growth of human promyelocytic leukemia HL-60 cells, breast cancer MCF7 cells, prostate cancer LNCaP cells, and human melanoma MeW-164 cells in the concentration 10^{-5}-10^{-7} mol/L.

In addition some of the synthesized coordination compounds show selective bacteriostatic and bactericidal activity for some gram-positive, gram-negative microorganisms and fungi in the range of concentration 0.59-200 μg/mL. It was determined that synthesized compounds manifest the best activity towards *Candida albicans* и *Staphylococcus aureus*.

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