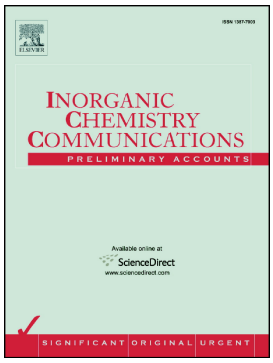

New copper(II) complex with bioactive 2–acetylpyridine-4N-p-chlorophenylthiosemicarbazone ligand: Synthesis, X-ray structure, and evaluation of antioxidant and antibacterial activity

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New copper(II) complex with bioactive 2–acetylpyridine-4N-*p*-chlorophenylthiosemicarbazone ligand: Synthesis, X-ray structure, and evaluation of antioxidant and antibacterial activity

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Abstract

2-acetylpyridine-4N-*p*-chlorophenylthiosemicarbazone ligand (HL) derived from the condensation of 2-acetylpyridine and *p*-chlorophenylthiosemicarbazide (pClT), and the corresponding Cu(II) complex, [Cu(L)Cl] were synthesized and characterized by different spectroscopic methods. Single crystal X-ray study of [Cu(L)Cl] complex displayed a square-planar coordination geometry around Cu(II) ion. The in vitro antibacterial activities of pClT, HL and [Cu(L)Cl] compounds were studied against a series of gram positive and gram negative bacteria, using the zone inhibition methods. Experimental results revealed that the involvement of pyridine cycle in the ligand backbone enhanced the antibacterial activity of the thiosemicarbazone ligand in comparison with its thiosemicarbazide precursor (pClT). In addition, the [CuLCl] complex had higher antibacterial activity than the free ligand. Further, the investigation of antioxidation properties showed that the thiosemicarbazone ligand (HL) and pClT have considerable in vitro radical scavenging activity over the Cu (II) complex, [CuLCl].

Keywords: Thiosemicarbazones; Copper(II) complex; Biological evaluation; Antibacterial; Antioxidant.

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