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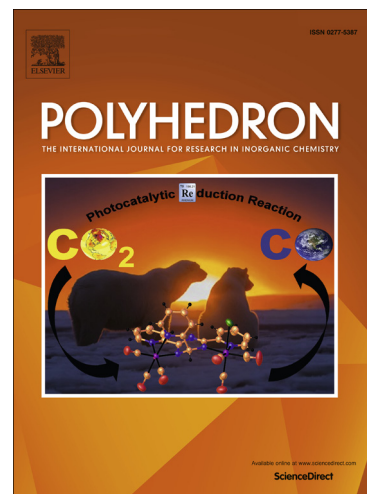
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Synthesis, crystal structure and antibacterial activities of mixed ligand copper(II) and cobalt(II) complexes of a NNS Schiff base

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ABSTRACT

Two new copper(II) complexes of different nuclearities, viz. mononuclear $[\text{CuL}_2(\text{H}_2\text{O})](\text{ClO}_4)_2$ (**1**), binuclear $[\text{Cu}_2\text{L}_2(\text{NCS})_2(\text{NO}_3)_2]$ (**2**) and a mononuclear cobalt(II) complex, $[\text{CoL}_2(\text{NCS})_2]$ (**3**), where HL = 2-{[pyridin-2-ylmethylidene]amino}benzenethiol, a tridentate Schiff base derived from 2-aminothiophenol and pyridine-2-al have been prepared. The complexes have been characterized by microanalytical, spectroscopic, single crystal X-ray diffraction and other physicochemical studies. Structural studies reveal that **1** is a mononuclear copper(II) complex with distorted square pyramidal geometry. But, **2** is a thiocyanato-bridged binuclear species in which each copper(II) ion adopts an irregular octahedral geometry containing chelating nitro groups. Complex **3** is comprised of a mononuclear octahedral unit containing two thiocyanato groups in *cis* positions around the central cobalt(II) ion. The complex units in **1-3** are held together by H-bonding, $\pi \dots \pi$ or $\text{O} \dots \pi$ interactions to develop supramolecular network in their respective solid states. The antibacterial activity of all the complexes along with the constituent Schiff base ligand has been evaluated against some Gram(+) and Gram(−) bacteria.

Keywords: Copper(II); Cobalt(II); Schiff base; Crystal structure; Supramolecular structure; Antibacterial activity

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1. Introduction

Transition metal complexes containing Schiff base ligands have been of specific interest for many years. Synthesis and characterization of such complexes of the first row transition metals including copper and cobalt have received overwhelming attention in recent times due to their important catalytic, magnetic and biological properties in addition to the structural aspects [1-6]. Significance

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