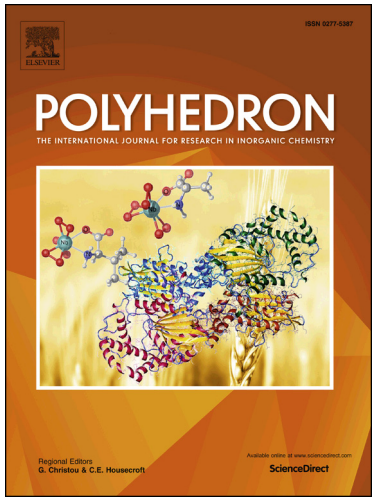

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Synthesis, crystal structure, spectroscopic studies and magnetic behavior of a new diphosphonate-bridged dinuclear copper(II) complex

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Abstract

A new dinuclear diphenyldiphosphonate bridged Cu(II) complex, $[Cu_2(\mu\text{-}Ph_2P_2O_5)_2(dmen)_2]$ (**1**), was synthesized by the reaction of equimolar amounts of $CuCl_2{\bullet}2H_2O$, *P*,*P*-dichlorophenylphosphine ($PhPCl_2$) and *N*,*N*′-dimethylethylenediamine (dmen) in acetonirile under an air atmosphere. The complex was characterized by spectroscopic methods, elemental analysis and single crystal X-ray diffraction studies. X-ray studies indicated that complex **1** is a centrosymmetric diphosphonate bridged dinuclear Cu(II) complex. The Cu(II) ions in complex **1** have a distorted square pyramidal coordination environment generated by the coordination of three oxygen atoms from the diphosphonate ligand and two nitrogen atoms from the dmen ligand. The complex was further studied by magnetic measurements and EPR analyses. Magnetic studies indicated that the diphosphonate ligand mediates a weak antiferromagnetic interaction between the Cu(II) ions, which was also confirmed by EPR analysis.

Keywords: Dinuclear Cu(II) complex; Crystal structure; Magnetic studies; Diphenyldiphosphonate ligand; Spectroscopic studies

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