Synthesis, spectral and magnetic properties, and crystal structures of copper(II)2-methylthionicotinate adducts with chelating ligands.

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The synthesis and characterization of $[Cu_2(2\text{-MeSnic})_4(H_2O)_2]$, $[Cu(2\text{-MeSnic})_2(en)]$, $[Cu(en)_2(H_2O)_2](2\text{-MeSnic})_2$ and $[Cu(dien)(H_2O)_2](2\text{-MeSnic})_2$ (where 2-MeSnic=2-methylthionicotinate, en=ethylenediamine, dien=diethylenetriamine) is reported. The characterizations were based on elemental analysis, infrared, electronic and EPR spectra, and magnetic susceptibility measurements over a temperature range of 1.9–300 K. The available evidence supports a dimeric structure for $[Cu_2(2\text{-MeSnic})_4(H_2O)_2]$ and for $[Cu(en)_2(H_2O)_2](2\text{-MeSnic})_2$ a tetragonal-bipyramidal environment about the copper(II) atom. The other two complexes were studied also by X-ray analysis. The $[Cu(dien)(H_2O)_2](2\text{-MeSnic})_2$ crystallizes in the monoclinic system. The copper(II) atom has a square-pyramidal arrangement, with three nitrogen atoms of the tridentate diethylenetriamine and one water molecule in the base of the pyramid, and the remaining water molecule occupies the apical position. The copper(II) atom deviates from the basal plane by 0.1164(5) Å toward the water molecule in the apical position. The copper(II) atom in $[Cu(2\text{-MeSnic})_2(en)]$ is coordinated by two symmetry-dependent nitrogen atoms of ethylenediamine and by two pairs of non-equivalently coordinated carboxyl oxygen atoms of two symmetry-dependent 2-methylthionicotinates with Cu□O bond distances of 1.975(2) and 2.564(2) Å, respectively, resulting in a highly distorted tetragonal-bipyramidal coordination.

Słowa kluczowe

Chelating ligands, Crystal structures, Copper(II) complexes, Pyridinecarboxylate complexes, Dimeric complexes

Adres publiczny

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