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Supramolecular rectangles and ladders constructed from Ni(II), Cu(II) and Zn(II) mononuclear complexes with bicompartamental ligands and 4-aminopyridine as tectons

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Dedicated to Professor Ionel Haiduc on the occasion of his 80th anniversary

Abstract

By reacting $[M^{II}(\text{valpn})]$ or $[M^{II}(\text{valdmpn})]$ mononuclear complexes with 4-aminopyridine in different molar ratios, five $[M^{II}(\text{valXpn})(4\text{-NH}_2\text{-py})]$ and one $[\text{Ni}^{II}(\text{valdmpn})(4\text{-NH}_2\text{-py})_2]$ complexes were obtained and structurally characterized ($M^{II} = \text{Ni}^{II}, \text{Cu}^{II}, \text{Zn}^{II}$; valpnH_2 and valdmpnH_2 are the Schiff bases resulted from the condensation of *o*-vanillin with 1,3-propylenediamine and 2,2-dimethyl-1,3-propylenediamine respectively). In the $[\text{Cu}(\text{valpn})(4\text{-NH}_2\text{-py})]$, $[\text{Ni}(\text{valpn})(4\text{-NH}_2\text{-py})]$, $[\text{Zn}(\text{valpn})(4\text{-NH}_2\text{-py})]$ and $[\text{Ni}(\text{valdmpn})(4\text{-NH}_2\text{-py})]$ complexes the metal ions are pentacoordinated with a square pyramidal geometry. The specific hydrogen bond interactions of the amino group belonging to the 4-aminopyridine with the free $\text{O}_2\text{O}'_2$ compartment of the Schiff base ligands led to various supramolecular architectures: rectangles, chains, and ladders. The spectroscopic properties of the compounds were also investigated.

Keywords: hydrogen bonding, supramolecular rectangles, supramolecular ladders, bicompartamental ligands, 4-aminopyridine, photoluminescence

Introduction

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