

Accepted Manuscript

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PII: S0277-5387(17)30359-5
DOI: <http://dx.doi.org/10.1016/j.poly.2017.05.021>
Reference: POLY 12640

To appear in: *Polyhedron*

Received Date: 25 March 2017
Accepted Date: 3 May 2017

Please cite this article as: S. Kumar, R.P. Sharma, P. Venugopalan, T. Aree, Effect of differently substituted methoxybenzoates on the supramolecular assemblies of three $[\text{Cu}(\text{N-hyden})_2](\text{o-/m-/p-methoxybenzoate})_2$ complexes: Synthesis, spectroscopic characterization and single crystal structure determination, *Polyhedron* (2017), doi: <http://dx.doi.org/10.1016/j.poly.2017.05.021>

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Effect of differently substituted methoxybenzoates on the supramolecular assemblies of three $[\text{Cu}(\text{N-hyden})_2](\text{o-/m-/p-methoxybenzoate})_2$ complexes: Synthesis, spectroscopic characterization and single crystal structure determination

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Abstract

Three new anhydrous $[\text{copper(II)}(\text{N-hyden})_2](\text{o-/m-/p-methoxybenzoate})_2$ complexes, **1-3**, (where *N-hyden* = N-(hydroxyethyl)ethylenediamine) have been prepared by the dropwise addition of *N-hyden* to the hydrated copper(II) o-/m-/p-methoxybenzoate complexes suspended in a methanol-water (4:1 v/v) mixture, followed by evaporation of the resulting solution at room temperature. They have been characterized by elemental analyses, spectroscopic techniques (FT-IR and UV-Vis), conductance measurements and magnetic susceptibility studies. Single crystal X-ray structure determination showed that complexes **1** and **3** crystallize in the monoclinic system $P2_1/c$, while complex **2** crystallizes in the triclinic system $P-1$; all in centrosymmetric space groups. The X-ray analysis of complexes **1-3** clearly revealed their ionic structures, consisting of one complex cation, $[\text{Cu}(\text{N-hyden})_2]^{2+}$, and two respective arylbenzoate (o-/m-/p-methoxybenzoate) anions. The Cu(II) center in each complex is octahedrally coordinated with two tridentate *N-hyden* ligands, in which two nitrogen and one oxygen atom of two *N-hyden* ligands are coordinated *trans* geometries. The crystal lattices in complexes **1-3** are stabilized by non-covalent interactions such as N-H...O, O-H...O hydrogen bonding and C-H... π interactions.

Keywords: copper(II); N-(hydroxyethyl)ethylenediamine; second sphere coordination; spectroscopic techniques; X-ray crystallography

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