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Original Research Article

### Synthesis, characterization, and crystal structure determination of a new copper (II) complex: $[H_2en][Cu(pydc)_2] \cdot 2H_2O$

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#### ABSTRACT

The new complex of  $[H_2en][Cu(pydc)_2] \cdot 2H_2O$  (1) (where  $H_2en$  and  $pydc$  are ethylenediammonium and 2,6-pyridinedicarboxylate, respectively) was synthesized by the reaction of a mixture of ethylenediamine ( $en$ ) and 2,6-pyridinedicarboxylic acid ( $H_2pydc$ ) in a mixture of  $CH_3OH/H_2O$  as solvent. This complex was fully characterized by elemental analysis, IR, UV-Vis spectroscopy as well as single-crystal X-ray diffraction method. The crystallographic analysis revealed that the complex of 1 consists of discrete  $[Cu(pydc)_2]^{2-}$  anion, one bis(protonated) ethylene diamine cation and two crystal water molecules. In the anionic part of this complex, the copper(II) cation is coordinated by two tridentate  $pydc$  anionic ligands through the two oxygen atoms of two carboxylate groups and one nitrogen atom of pyridine ring. Also, in this complex, intermolecular C-H...O, N-H...O and O-H...O hydrogen bonds and the strong  $\pi \dots \pi$  interactions between the pyridine rings are effective on the stabilization of the crystal packing.

**Keywords:** Cu (II) complex, Crystal structure, Ethylene diamine, 2,6-Pyridinedicarboxylic acid.

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