

Synthesis, Spectral and Thermal Properties, and Crystal Structure of Bis(ethylenediamine)(aqua)copper(II) (Bis)syringate Ethylenediamine Dihydrate $[\text{Cu}(\text{en})_2(\text{H}_2\text{O})](\text{sy})_2(\text{en})(\text{H}_2\text{O})_2$

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The complex $[\text{Cu}(\text{en})_2(\text{H}_2\text{O})](\text{sy})_2(\text{en})(\text{H}_2\text{O})_2$ has been synthesized and characterized by its electronic and vibrational spectra. The molecular structure of the complex has been determined by X-ray diffraction methods. The complex crystallizes in the orthorhombic space group *Pnma* with unit-cell parameters $a = 10.7236(5)$, $b = 20.4660(10)$, $c = 14.4523(11)$ Å and $Z = 4$. In the cation, the Cu(II) ion has a distorted square pyramidal coordination with two bidentate (en) ligands forming the basal plane and a H₂O molecule in the apical position. The complex cations and syringate anions constitute chains along the *b* axis in –A–B–A– fashion. The members of the chains are linked by through N–H···O hydrogen bonds. The (en) molecules are responsible for connecting adjacent layers.

Key words: Syringic Acid, Ethylenediamine, Copper (II) Complex, Thermal Properties