Synthesis, Spectral and Thermal Studies, and Crystal Structure of *cis*-Bis(imidazole)bis(picolinato)copper(II) Dihydrate $[Cu(pic)_2(im)_2]\cdot 2H_2O$

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The mixed-ligand picolinato (pic) complex of Cu(II) with imidazole (im), $[Cu(pic)_2(im)_2]\cdot 2H_2O$, was synthesized and characterized by elemental analysis, magnetic susceptibility, spectral methods (UV/vis and FT-IR), simultaneous TG, DTA techniques, mass spectroscopy, and X-ray diffraction. The complex crystallizes in the monoclinic space group *Cc* with the following unit cell parameters: $a = 16.381(1)$, $b = 9.556(1)$, $c = 5.177(1)$ Å, $\beta = 119.074(5)^\circ$, $Z = 4$. In the octahedral complex, the picolinato ligands are coordinated to the copper(II) ion as bidentate *N*,*O*-donors forming chelate rings. The imidazole ligands are *N*-coordinated at *cis* positions. The thermal decomposition pathway of the complex has been studied by the help of thermal analyses data (TG and DTA) and of the mass spectroscopic fragmentation pattern. The volatile products observed in the thermal decomposition process were also observed in the mass spectrometer ionisation process, except for the molecular peak, and it was concluded that the ionisation and thermal decomposition pathways of the complex resemble each other.

Key words: Picolinic Acid, Imidazole, Copper(II) Complex, Thermal Decomposition