

Synthesis, Crystal Structure, Spectral and Thermal Characterization of *cis*-Diaquabis(1,10-phenanthroline)zinc(II) Diorotate Hydrate, $cis-[Zn(H_2O)_2(phen)_2](H_2Or)_2 \cdot (H_2O)_{2.125}$

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Preparation, X-ray crystal structure, thermal behavior, and IR spectroscopic studies of *cis*-diaquabis(1,10-phenanthroline)zinc(II) diorotate hydrate are described. In the compound $[Zn(H_2O)_2(C_{12}H_8N_2)_2](C_5H_3N_2O_4)_2 \cdot (H_2O)_{2.125}$ (**1**), the zinc ion, located on a twofold axis, is coordinated by two aqua ligands together with a pair of bidentate 1,10-phenanthroline (phen) molecules, and exhibits a distorted octahedral coordination. The orotate anions have a single negative charge each. The metal-coordinated water molecules link the orotate ions to the metal complex *via* O–H···O hydrogen bonds. Also the uncoordinated water molecules are bonded to orotate ions through O–H···O hydrogen bonds. Thus, an extensive network of hydrogen bonds together with π - π , and π -ring interactions stabilize the crystal structure and form an infinite three dimensional structure. The thermal decomposition pathway of **1** has been investigated by the help of thermal analysis data (TG, DTG and DTA).

Key words: Orotic Acid, 1,10-Phenanthroline, Thermal Decomposition