

SYNTHESIS AND STRUCTURAL CHARACTERIZATION OF NANO-SCALE TWIN CRYSTAL OF COPPER TARTARATE

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ABSTRACT

Twin crystal structure coordination compound [Cu (Tar)₂(2H₂O)] was synthesized using soft synthetic method by reaction of Cu (II) salt with tartaric acid after complete dissolution of the two reactants. The compound was characterized by Elemental Analysis, Infrared, UV and Visible spectroscopy and Single crystal x-ray diffraction. Elemental Analysis, Infrared, UV and Visible spectroscopy vividly showed the coordination of the deprotonated group of the tartaric acid being coordinated to the copper metal. The 3 dimensional model of the compound revealed twin compound to be found in every single crystal of the compound. The crystals display triclinic space group with $a = 6.7007 (8) \text{ \AA}$, $b = 7.3002 (9) \text{ \AA}$, $c = 8.9439 (14) \text{ \AA}$, $\alpha = 68.499 (4)^\circ$, $\beta = 79.764 (6)^\circ$ and $\gamma = 65.703 (4)^\circ$ by exhibiting octahedral geometry. Each copper (II) ion is thus coordinated to six oxygen atoms; 2 carboxylate oxygen, two hydroxyl oxygen and two oxygen from water molecule.

KEYWORDS: Synthesis, characterization, x-ray crystallography