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## Synthesis, characterization, structure and DNA binding aspects of a trinuclear copper(II) complex having a Cu<sub>3</sub>O core

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### Abstract

The oxime based ligand, 3-(thiophen-3-yl-methylene-hydrazono)-butan-2-one oxime, has been synthesised by the 1:1 Schiff-base condensation of diacetyl-monoxime monohydrazone with thiophene-2-carboxaldehyde in methanol. Subsequently, the trinuclear copper(II) complex was synthesized by 1:1 reaction of the above ligand with Cu(ClO<sub>4</sub>)<sub>2</sub>.6H<sub>2</sub>O. Both the ligand and complex have been characterized by C, H, N microanalyses, ESI-MS, FT-IR and UV-Vis spectra. The X-ray crystal structure of the complex has been determined. The structure revealed that the oximate bridged trinuclear copper(II) compound has a discrete Cu<sub>3</sub>O core. The DNA binding aspect of both the ligand and complex was studied by several spectroscopic techniques. The thermodynamic parameters of binding were also determined by temperature dependent fluorescence titrimetric means. The negative enthalpy and entropy change suggest that the interaction may take place via van der Waal's interaction or hydrogen bond formation.

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**Keywords:** Oxime; Cu<sub>3</sub>O core; Structure; DNA binding; Thermodynamic parameters

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