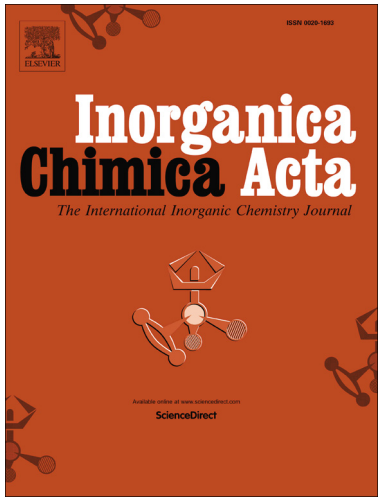

Research paper

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PII: S0020-1693(16)30831-3
DOI: http://dx.doi.org/10.1016/j.ica.2017.03.025
Reference: ICA 17485

To appear in: *Inorganica Chimica Acta*

Received Date: 8 November 2016
Revised Date: 8 March 2017
Accepted Date: 13 March 2017

Please cite this article as: J.P. Naskar, B. Guhathakurta, P. Basu, N. Bandyopadhyay, G.S. Kumar, M. Zhu, L. Lu, Synthesis, characterization, structure and DNA binding aspects of a trinuclear copper(II) complex having a Cu_3O core, *Inorganica Chimica Acta* (2017), doi: http://dx.doi.org/10.1016/j.ica.2017.03.025

Synthesis, characterization, structure and DNA binding aspects of a trinuclear copper(II) complex having a Cu_3O 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 $Cu(ClO_4)_2.6H_2O$. 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 oximato bridged trinuclear copper(II) compound has a discrete Cu_3O 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.

Keywords: Oxime; Cu_3O core; Structure; DNA binding; Thermodynamic parameters