

MS035.P23

*A ferromagnetic tetranuclear Cu(II) complex: catecholase and phenoxazinone synthase activities*Merry Mitra^{1,5}, Tanay Kundu², Gurpreet Kaur³, Gyaneswar Sharma⁴, Angshuman Roy Choudhury⁵, Yogesh Singh⁵, Rajarshi Ghosh⁶

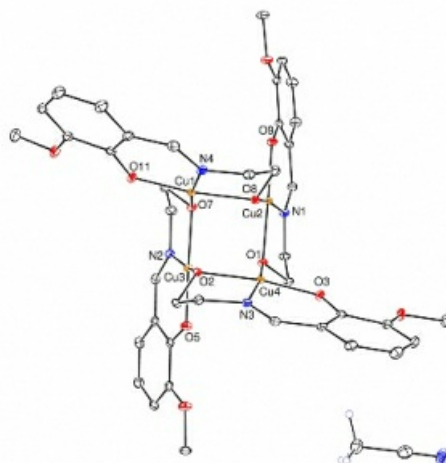
¹Indian Institute Of Science Education And Research, Kolkata, Kolkata, India, ²Physical/Materials Chemistry Division, National Chemical Laboratory, Pune 411 008, India, Pune, India, ³Department of Chemical Sciences, Indian Institute of Science Education & Research, Mohali, S.A.S. Nagar, Mohali, India, ⁴Department of Physical Sciences, Indian Institute of Science Education & Research, Mohali, Sector 81, S.A.S. Nagar, Knowledge City, Manauli PO, Mohali 140 306, India, Mohali, India, ⁵Department of Chemical Sciences, Indian Institute of Science Education & Research, Mohali, Sector 81, S.A.S. Nagar, Knowledge City, Manauli PO, Mohali 140 306, India, Mohali, India, ⁶Department of Chemistry, The University of Burdwan, Burdwan 713 104, India, Burdwan, India
E-mail: merry.mitra@gmail.com

A crystallographically characterized tetranuclear Cu(II) complex [CuII₄(L)₄] (1) [H₂L = N-(2-hydroxyethyl)-3-methoxysalicylalimine] is found to show overall ferromagnetic exchange coupling. High nuclearity transition-metal complexes are of current interest for their possible utility in molecular magnetism¹ with special emphasis on single molecule magnets.² Copper has long been the metal of choice for assembling high nuclearity cluster³ primarily based on ligands with oxygen along with nitrogen donor atoms. Moreover, dinuclear copper complexes play an important role in biological metalloenzymes. Complex (1) mimics the catalytic activity of the plant enzyme catechol oxidase by oxidising 3,5-di-tert-butylcatechol to its corresponding quinone in methanol and dichloromethane medium in presence of aerial oxygen. The reaction follows Michaelis-Menten enzymatic reaction kinetics with turnover numbers (K_{cat}) 6.99 × 10³ and 1.85 × 10³ h⁻¹ in methanol and dichloromethane, respectively. 1 is also phenoxazinone synthase active in methanol medium with a turnover number of 1.21 × 10⁵ h⁻¹.

[1] Hernández-Gil, J. N. et al. (2013) *Inorg. Chem.* 52, 2289-2291.

[2] Masello, A. et al. (2013) *Inorg. Chem.* 52, 10414-10423.

[3] Si, S. -F. et al. (2002) *Inorg. Chem. Commun.* 5, 76-77.



Keywords: [Tetranuclear copper](#), [ferromagnetic](#), [catalysis](#)