

Abstract

A set of homo and heterodinuclear complexes of copper(II) and zinc(II) of two μ -bis(tetradentate) ligands have been studied for possible synthetic models for the active sites of different metalloenzymes. Effect of different bridging groups was explored for paramagnetic, electrochemical and EPR studies. Single crystal X-ray crystallographic studies have been made to establish the three dimensional molecular structures of ligands and complexes. Dicopper(II/II) and (I/I) complexes of all N-donor μ -bis(bidentate) Schiff base ligand are developed to explore the effectiveness of the ligand system in stabilizing the +1 state and possibility for phenyl ring hydroxylation reaction. Using these μ -bis(tetradentate) ligands pseudo-octahedral triply bridged dimanganese(III/III) complexes with $[\text{Mn}_2^{\text{III}}(\mu\text{-OPh})]^{5+}$ core and different exogenous bridging groups are synthesized. All these complexes register exogenous bridge are mediated spin-spin magnetic interactions. The multiple electron transfer behaviour of these complexes also establishes the relative thermodynamic stability of the III/III oxidation state.

Key words: Hemocyanin; tyrosinase; Schiff base; imidazolidine; μ -bis(tetradentate); dicopper(II/II); phenoxo-bridging; triply bridging; exogenous; endogenous; X-ray structure; single crystal; alkoxide; heterodimetallic; catechol oxidase; xanthate; cyclic voltammetry; quasireversible; dicopper(I/I); hydroxylation; self-assembly; μ -bis(bidentate); Mn-catalase; ribonucleotide reductase; thiosulphate oxidase; sweet potato phosphatase; diamagnetic; unsymmetrical; dimanganese(III/III); dimanganese(IV/IV); electron paramagnetic resonance.