

Research title : Iron, zinc and copper complexes with a multidentate ligand

Abstract

The Methyl 2-((2-hydroxy-5-methyl-3-(((2-amino-2-oxoethyl)pyridin-2-ylmethylamino)methyl)benzyl)(2-hydroxybenzyl)amino]acetate (H_2L), which is a multidentate ligand, able to react with transition metals to form binuclear metalloenzymes where the necessity for a heterovalent active site [Fe(III) - Fe(II)] and [Fe(III) - Zn(II)] for enzymes catalyst of binuclear complexes has been established. In this research, the Infrared, 1H -NMR, ^{13}C -NMR and mass spectrometry techniques were used to confirm structures. H_2L , which is a ligand, has been reacted with iron(III) / iron(II) or iron(III) / zinc(II) to produce a binuclear complex, complex **(1)** and tetranuclear complex, complex **(2)**. Both complexes have been characterized by spectroscopy techniques and UV - Visible. It was found that six donor atoms set of the ligand surrounded to the binuclear of metal centers, Fe(III), Fe(II) in complex **(1)** and Fe(III), Zn(II) in complex **(2)** as confirmation from mass spectra. The UV - Visible absorption maxima of [Fe(III) - Fe(II)] and [Fe(III) - Zn(II)] have been found at 456 and 471 nm, respectively, in which these spectra are charge - transfer metal to ligand. The chemical formula of complex **(1)**, $[Fe_2(L)(\mu - O)(H_2O)_2](ClO_4)_2 \cdot 4H_2O$ and of complex **(2)**, $[Fe_2Zn_2(L)_2(\mu - O)(\mu - OH)(OAc)_2](ClO_4)$ has been confirmed by mass spectrometric technique.

Keywords : Heterovalent active site [Fe(III) - Fe(II)] and [Fe(III) - Zn(II)]