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ORIGINAL ARTICLE

Chemical and pharmacological aspects of novel hetero MLB complexes derived from NO_2 type Schiff base and N_2 type 1,10-phenanthroline ligands

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Abstract A series of hetero ligand MLB complexes (**1**–**5**) were synthesised from tridentate NO_2 type Schiff base [$\mathbf{H_2L}$: (*E*)-2-((2-hydroxy-4-methoxyphenyl)(phenyl)methyleneamino)benzoic acid; derived from 2-hydroxy-4-methoxybenzophenone and 2-aminobenzoic acid] and bidentate N_2 type 1,10-phenanthroline (**B**: phen) ligands. The structural characterization of the synthesised MLB complexes were carried out *via* analytical as well as various spectral studies. Additionally, the low molar conductance values (Λ_m = 14–22 Ω^{-1} cm^2 mol^{-1}) imply that the complexes (**1**–**5**) are non-electrolytes. The obtained results reinforce that stoichiometry of the mononuclear hetero ligand complexes can be represented as [M(II)-Schiff base(L)-phen(B)·H_2O] and both $\mathbf{H_2L}$ and (**B**) ligands can act as tri and bidentates respectively. Moreover, both the ligands bind with metal(II) ions to build a stable six, six, five membered chelate rings with octahedral geometry. The existing solvent water molecule is confirmed from thermal as well as vibrational analysis. Their microcrystalline nature and uniform surface morphology were confirmed by both powder XRD and SEM studies. 3D molecular modeling and analysis of NiLB and CuLB complexes (**3** and **4**) were also studied. Mn(II), Ni(II) and Cu(II) complexes (**1**, **3** and **4**) strongly interact with DNA through intercalation binding with strong binding constant values. The obtained K_{app} values were 5.23, 4.98, 6.36, 7.21 and 4.86 × 10^5 mol^{-1} for MLB complexes (**1**–**5**) respectively and the negative $\Delta^{\ddagger}G$ values shown that

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