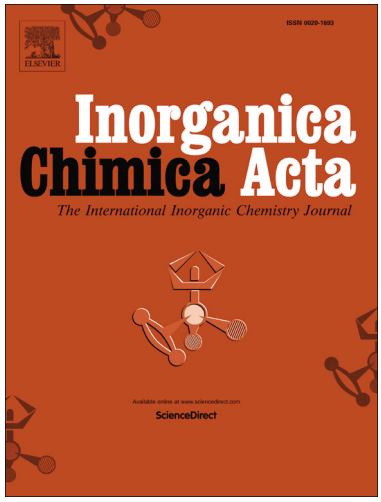

Research paper

Synthesis, Crystal structure and Biological studies of New Hydrazone ligand, 2-(Methoxycarbonyl-hydrazono)-pentanedioic acid and its Silver(I) complex

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Synthesis, Crystal structure and Biological studies of New Hydrazone ligand, 2-(Methoxycarbonyl-hydrazono)-pentanedioic acid and its Silver(I) complex

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Abstract

A new hydrazone ligand (2-(Methoxycarbonyl-hydrazono)-pentanedioic acid, **H_2L**), derived from methyl carbazate and α-ketoglutaric acid, and its Ag(I) complex **[Ag(HL)(H_2L)]** were synthesised and characterised by elemental, spectral and thermal analyses. The X-ray structures of the ligand and complex were determined. The silver ion is hexa-coordinated to two tridentate (O, N, O) hydrazone ligands in a distorted octahedral environment. The binding carboxylic acid group is protonated in one of the ligands (netural) while it is present as the carboxylate in the other (negatively charged) ligand. The bulk material of the complex thermally decomposes to form metallic silver sheets. The ability to scavenge radical of both, the ligand and complex, was studied against these radicals: $DPPH^{\bullet}$, $ABTS^{\bullet+}$, $NO^{\bullet}$ and $O_2^{\bullet-}$. The binding affinity and mode of binding towards CT-DNA were recorded by UV-absorption and the ethidium bromide displacement method. The interaction of ligand and complex with bovine serum albumin was investigated using UV-Vis, fluorescence and synchronous spectroscopic methods. The silver complex showed strong binding propensity than the free Schiff base ligand in binding studies. The antimicrobial activity was studied against both bacteria and fungi strains and the silver complex exhibited significant activity as compared to the ligand alone. Significantly high antimicrobial activity was noticed especially for *Staphylococcus aureus,* and *Escherichia coli* which were extensively studied by MIC