

Turkish Journal of Chemistry

Turkish Journal
of
Chemistry



Synthesis and crystal structure of a novel multimodal ligand, 6,6'-bis(2-(di(pyridin-2-yl)methylene)-1-methylhydrazinyl)-2,2'-bipyridine, and its copper(I) complex, $\{[\text{Cu}_3\text{L}_2](\text{PF}_6)_3 \cdot 3\text{H}_2\text{O}\}$ (1)

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Abstract: The single crystal X-ray structure of the novel multimodal ligand 6,6'-bis(2-(di(pyridin-2-yl)methylene)-1-methylhydrazinyl)-2,2'-bipyridine, $\text{C}_{34}\text{H}_{28}\text{N}_{10}$ (L), was determined at 120 (2) K. The ligand possesses a centre of symmetry that generates a planar bipyridyl core with the hydrazone substituents in a trans-geometry. The di-2-pyridyl moieties at either terminus of the molecule twist out of the plane (52.90 and 56.32 Å). The crystal structure comprises 2-dimensional ribbons that stack about each other so as to optimise van der Waals interactions and packing efficiency. Studies of the coordination properties of the novel multimodal ligand with copper(I) show that 2 ligand strands wrapped around the copper(I) having a preference for tetrahedral geometry to furnish a supramolecular self-assembled of a double-stranded tri-nuclear helical complex, $\{[\text{Cu}_3\text{L}_2](\text{PF}_6)_3 \cdot 3\text{H}_2\text{O}\}$ (1), as revealed by the ESI-MS, and further characterised by ¹H-NMR, UV-Vis, and FT-IR spectra.

Key Words: Bipyridine derivatives; hydrazone; dipyridyl ketone; metal complexes; N-donor ligands

Turk. J. Chem., **34**, (2010), 781-791.

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