Crystal Structures and Stability of Two Bipyridyl Complexes of Metal Chloroacetates

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The complexes Mn(Cl\textsubscript{3}CCOO\textsubscript{2})(4,4\textsuperscript{'}-bpy) (1) and [Cu\textsubscript{2}(CICH\textsubscript{2}COO)(2,2\textsuperscript{'}-bpy\textsubscript{2})(OH)(H\textsubscript{2}O)]\textsuperscript{-(NO\textsubscript{3})\textsubscript{2}} (2) (bpy = bipyridine) were generated under mild reaction conditions and characterized by IR spectra, thermogravimetric analysis (TGA), X-ray powder diffraction (XRD), and single crystal X-ray diffraction. Compound 1 exhibits a two-dimensional network with octahedrally coordinated Mn(II) atoms linked by 4,4\textsuperscript{'}-bpy ligands and Cl\textsubscript{3}COO\textsuperscript{-} ligands. Compound 2 features a supramolecular structure of binuclear complexes, with edge-sharing five-coordinated square-pyramidal units bridged by the CICH\textsubscript{2}COO\textsuperscript{-} ligand, an OH\textsuperscript{-} group and a water molecule. Complex 1 crystallizes in the orthorhombic space group \textit{Pbcn} with cell parameters: \(a = 16.5390(17), b = 11.6396(17), c = 9.9181(12) \text{ Å}, V = 1909.3(4) \text{ Å}^3\), \(Z = 4, wR2 = 0.1576\). Complex 2 crystallizes in the triclinic space group \textit{P1} with cell parameters: \(a = 7.6190(15), b = 11.151(2), c = 16.640(3) \text{ Å}, \alpha = 73.13(3), \beta = 80.89(3), \gamma = 74.51(3)\), \(V = 1298.73(4) \text{ Å}^3\), \(Z = 2, wR2 = 0.1265\).

Key words: Crystal Structures, Metal Chloroacetate Complexes, Thermal Behavior