

Abstract

The binuclear copper complex $[\text{Cu}(\text{H}_2\text{slox})]_2$ (1) and heterobinuclear copper and molybdenum complexes $[\text{Cu}(\text{slox})\text{MoO}_2(\text{A})_2]$ (slox = tetraneg. disalicylaldehyde oxaloyldihydrazone) ($\text{A} = \text{H}_2\text{O}$ (2), py (3), 2-pic (4), 3-pic (5), 4-pic (6)) and $[\text{Cu}(\text{slox})\text{MoO}_2(\text{NN})]$ ($\text{NN} = \text{bpy}$ (7) and phen (8)) were synthesized from disalicylaldehyde oxaloyldihydrazone in methanol and characterized by various physicochemistry and spectroscopic techniques. The stoichiometry of the complexes was established based on elemental analyses and thermoanalysis studies. The χ_{eff} values for the complexes rule out metal-metal interaction between the metal centers in the structural unit of the complexes. The dihydrazone has keto-enol forms; in 1, it is a dibasic tetradentate bridging ligand in *enol* form and in heterobinuclear complexes as a tetrabasic hexadentate bridging ligand. Electronic spectra of the complexes show that copper(II) is square-planar in binuclear and heterobinuclear complexes; molybdenum is a distorted octahedral stereochemistry in heterobinuclear complexes. EPR spectra suggest that in all complexes, the unpaired electron is in the $\text{dx}_2\text{-y}_2$ orbital of copper and that the copper in heterobinuclear complexes is tetrahedrally distorted.