Synthesis, Crystal Structure, and DNA-Binding Studies of a Ni(II) Complex with the Tris(N-methylbenzimidazol-2-ylmethyl)amine Ligand

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A tripod ligand tris(N-methylbenzimidazol-2-ylmethyl)amine (Mentb) and its nickel(II) picrate (pic) complex, with composition [Ni(Mentb)(DMF)(H₂O)](pic)₂, have been synthesized and characterized on the basis of elemental analyses, molar conductivities, IR spectra, and UV/Vis measurements. Single-crystal X-ray diffraction revealed that the Ni atom is six-coordinated in a distorted octahedral geometry. In addition, the DNA-binding properties of the ligand Mentb and its Ni(II) complex have been investigated by electronic absorption, fluorescence and viscosity measurements. The experimental results suggest that the ligand and its Ni(II) complex bind to DNA via an intercalation binding mode, and their binding affinity to DNA follows the order of complex > ligand.

Key words: Tris(N-methylbenzimidazol-2-ylmethyl)amine, Ni(II) Picrate Complex, Crystal Structure DNA Binding