

The interaction of rhenium(V) compounds with DNA and oligonucleotides

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The DNA binding ability of inert chiral transition metal complexes has attracted considerable interest. DNA-binding compounds interact with duplex DNA in two principal ways: groove binding and intercalation.¹ Combinatorial chemistry has made available a large number of candidate DNA-binding agents. A great deal of attention is being paid to DNA interactions of mixed ligand complexes. Some classes of mononuclear rhenium(V) complexes with α -diimine ligands serve as novel types of intra- and interstand cross-links, suggesting that different DNA-binding modes indeed may have different biological effects².

In this work, the synthesis and characterization of new complexes of rhenium(V) with α -diimine ligands is presented. The usual spectroscopic methods (IR, 1D and 2D NMR, UV-Vis) and elemental analysis have been employed for their characterization. Moreover, detailed studies on the interaction of natural DNA with these compounds are presented in order to investigate the conformational changes and thermal stability of DNA double helix. Studies also on the photocleavage of DNA by rhenium complexes have taken place. The interactions of the aforementioned compounds with DNA were investigated through circular dichroism spectroscopy (CD), DNA thermal denaturation analysis, whereas their interaction with oligodeoxynucleotides was studied by 1D and 2D nuclear magnetic resonance, UV-visible and circular dichroism spectroscopy.

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