

Tris-HCl buffer solution (pH=7.0) containing 20 mM sodium chloride at 300 and 310K. Studies of antitumor activity of this complex against human cell tumor lines(k562) have been carried out. It shows IC50 value lower than that of cisplatin. There is a set of 6 binding sites (g) for the complex on the DNA with positive cooperativity in binding. n, the Hill coefficient (as a criterion of cooperativity) find out to be 5.6 at 300 K and 7.3 at 310 K, respectively. K app the apparent equilibrium constant are 21.4 mM⁻¹ and 39.3 mM⁻¹ at 300 and 310K respectively. The above compound can denature the DNA and the concentration of this ligand in the midpoint of transition ([L]_{1/2}), is decreased by improving temperature, from 0.25 mmol/L at 300K to 0.28 mmol/L at 310K. the conformational stability of DNA in the interaction with ligand (ΔG° H₂O) determined to be 32.5 kJ/mol and 35.7 kJ/mol at 300 and 310 K, respectively. Presence of ligand led to less stability of the DNA. values for m, (a measure of ligand strength for DNA denaturation) are 121 and 153 (kJ/mol).(mmol/L)⁻¹ at 300 and 310 K, respectively. Enthalpy of DNA denaturation by the complex (ΔH° coformation or ΔH° denaturation) in the range of 300 and 310 K is find out to be 42.2 kJ/mol. In addition, the calculated entropy (ΔS° H₂O) of DNA denaturation by complex is -0.23 kJ/mol at 300 K. the negative value of entropy change is related to the more disorder of denatured DNA with respect to the native DNA. Fluorescence titration spectra and fluorescence Scatchard plots suggest that the Pd(II) complex intercalate in DNA. The gel chromatograms obtained from Sephadex G-25 column experiments showed that the binding of metal complex with DNA is so strong that it does not readily break.

Keywords: Thermodynamic Parameters, Spectroscopic Techniques, Anti-Tumor, DNA-Binding, Palladium (II) Complex.

Abstract No.87

Spectroscopic Studies on the Thermodynamic and Thermal Denaturation of the CT-DNA Binding with [Pd(en)(dppz)](NO₃)₂

Somaye Shahrak^{}, Hassan Mansouri Torshizi*

Department of Chemistry, University of Sistan and, Baluchestan,
Zahedan, IR
(E-mail: somaye_shahraki@yahoo.com)

The development of new metal complexes which can selectively interact with nucleic acid is of much current interest. During recent years, the interest for metal complexes containing planar extended polyaromatic ligands has increased tremendously, mainly for their usage as probes capable to utilize the nucleic acid structures and as DNA-molecular light

switches. Many efforts have been directed towards the design of complexes containing modified bpy or phen ligands that bind DNA primarily via-base pair intercalation. In this study, we report the results of investigation of interaction between calf thymus DNA (CT-DNA) and [Pd(en)(dppz)](NO₃)₂ complex (where en is ethylenediamine and dppz is dipyrido[3,2-a:2',3'-c]phenazine). Electronic absorption, fluorescence titration and gel filtration experiments were employed to determine the thermodynamic parameters, binding parameters and the mode of binding between this complex and DNA in Tris-HCl buffer solution containing 20mM sodium chloride (pH=7.0) at 300 and 310 K. Studies of antitumor activity of this complex against human cell tumor lines(k562) have been carried out. It shows IC50 value lower than that of cisplatin. The above compound can denature the DNA and the concentration of this ligand in the midpoint of transition ([L]_{1/2}), is 0.046 mmol/L at 300 K and 0.045 mmol/L at 310 K. the conformational stability of DNA in the interaction with ligand (ΔG° H₂O) determined to be 485.5 kJ/mol and 385.2 kJ/mol at 300K and 310K respectively. There is one set of 5 binding sites (g) for the complex on the DNA (per 1000 nucleotides) with positive cooperativity in binding. n, the Hill coefficient (as a criterion of cooperativity) find out to be 4 at 300 K and 6 at 310 K respectively. K app the apparent equilibrium constant are 14.37 mM⁻¹ and 18.9 mM⁻¹ at 300 and 310 K, respectively. Presence of complex led to less stability of the DNA. Values for m, (a measure of ligand strength for DNA denaturation) are 162 and 155 (kJ/mol).(mmol/L)⁻¹ at 300 and 310 K, respectively. Enthalpy of DNA denaturation by the complex (ΔH° coformation or ΔH° denaturation) in the range of 300 and 310 K is find out to be 42.1 kJ/mol. In addition, the calculated entropy (ΔS° H₂O) of DNA denaturation by complex is 0.12 kJ/mol at 300K. Fluorescence titration spectra and fluorescence Scatchard plots suggest that the Pd(II) complex intercalate in DNA. The gel chromatograms obtained from Sephadex G-25 column experiments showed that the binding of metal complex with DNA is so strong that it does not readily break.

Keywords: Thermodynamic Parameters, Spectroscopic Studies, Anti-Cancer, Palladium (II) Complex, DNA-Binding.

Abstract No.88

Comparative Structural Analysis of two forms (m1/m2) of p55 Domain of Helicobacter Pylori Vacuolating Toxin

*Saeid Latifi-Navid¹, Shiva Mohammadi^{*1}, Hamid Latifi-Navid¹,
Saber Zahri¹, Amir Nasser Shamkhali²*

1. Department of Biology, Faculty of Sciences, University of
Mohaghegh Ardabili, Ardabil, IR