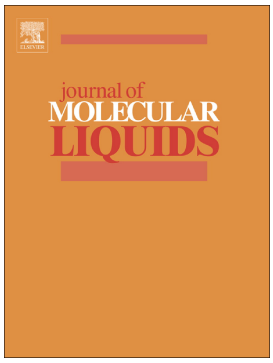



# Multi-analytical studies about physico-chemical properties of Ni(II)-vitamin B6 coordination compounds and their CT-DNA interactions

Agnieszka Chylewska, Małgorzata Biedulska, Mariusz Makowski

PII: S0167-7322(17)32963-X
DOI: doi: 10.1016/j.molliq.2017.08.100
Reference: MOLLIQ 7808

To appear in: *Journal of Molecular Liquids*

Received date: 4 July 2017
Revised date: 25 August 2017
Accepted date: 27 August 2017

Please cite this article as: Agnieszka Chylewska, Małgorzata Biedulska, Mariusz Makowski , Multi-analytical studies about physico-chemical properties of Ni(II)-vitamin B6 coordination compounds and their CT-DNA interactions, *Journal of Molecular Liquids* (2017), doi: 10.1016/j.molliq.2017.08.100

# Multi-analytical studies about physico-chemical properties of Ni(II)-vitamin $B_6$ coordination compounds and their CT-DNA interactions

Agnieszka Chylewska[a], Małgorzata Biedulska[a,*], Mariusz Makowski[a,*]

[a]*Faculty of Chemistry, University of Gdansk, Wita Stwosza 63, 80-309 Gdansk, Poland*

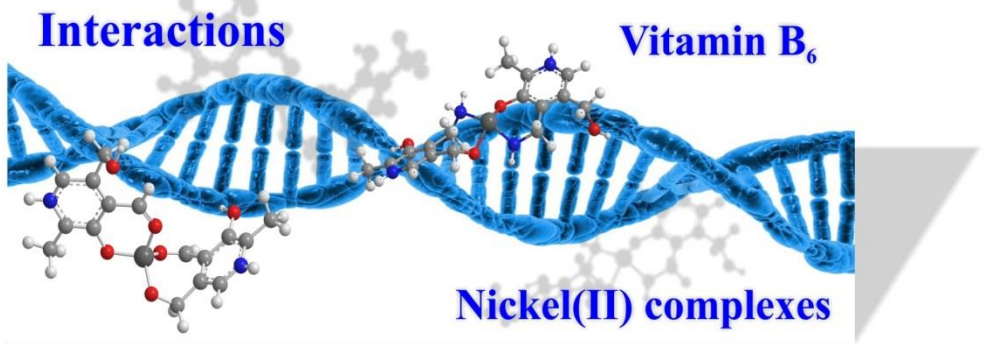
## ABSTRACT

Two coordination compounds and their structural characterization of $[Ni(PM)_2]Cl_2$ and $[Ni(PL)_2]Cl_2$ have been studied. Pyridoxamine (PM) and pyridoxal (PL) denote individual vitamers of vitamin $B_6$ and both demonstrated bidentate nature inside the complexes. The acid-base behavior of the mentioned complexes and their possible interactions with biomolecules in solutions have been never reported. Here, UV-spectroscopic, potentiometric, cyclic voltammetric studies have been carried out on the interaction of the Ni(II)-vitamer complexes with protons as well as with *calf thymus*-DNA (CT-DNA) in aqueous medium. The acidity constants values of coordination compounds studied have been determined and compared. The potentiometric and pHmetric-spectrophotometric microtitrations were carried out at the same conditions of temperature and pH range, 25 °C and 1.72-11.68, respectively. The procedural decomposition temperatures of the complexes were given and considered in relation to the structures of the examined compounds to complete the structural description of $[Ni(PM)_2]Cl_2$ and $[Ni(PL)_2]Cl_2$. The CT-DNA binding potential of Ni(II) complexes was carried out by absorption spectroscopy and cyclic voltammetry methods. Mechanism investigation have demonstrated that examined compounds could interact to CT-DNA by grooving binding mode, which was stabilized by hydrogen bond and van der Waals forces.

***Keywords***

Ni(II) complexes; Pyridoxamine; Pyridoxal; Potentiometry; DNA; UV Spectroscopy; Cyclic voltammetry; Thermogravimetry.

## GRAPHICAL ABSTRACT




*Corresponding authors. E-mails: mariusz.makowski@ug.edu.pl (M. Makowski); malgorzata.biedulska@phdstud.ug.edu.pl (M. Biedulska)