Oral Presentation

Water Soluble Novel Dicationic $[Cu(phen)(N_3)]Br_2$ Complexes: DNA-binding and Bio-logical Activities

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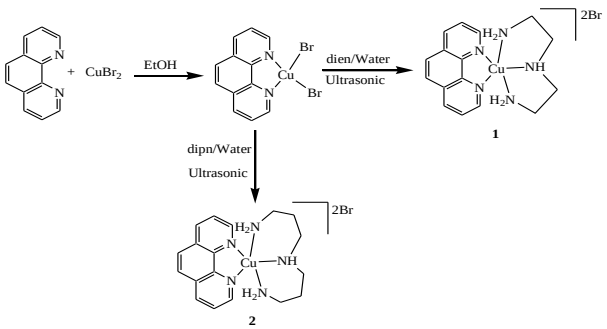
Abstract: Novel water soluble dicationic copper(II) complexes, of general formula [Cu(phen)(NNN)]Br2 [phen = 1,10-phenanthroline , NNN= diethelenetriamine (dien) and dipropylenetriamine (dipn)], have been prepared. The structures of the desired complexes were characterized by spectroscopic, element analysis, Uv-visible, IR, thermal and X-ray crystallographic techniques. These complexes exhibit a promising antimicrobial effect against an array of microbes at 200 µg/ml concentration. The absorption spectra of such complexes were modeled by time-dependent density functional theory (TD-DFT) and the absorption maxima around 620 nm and 280 nm are assigned to the d–d and Phen(π) →Phen(π*) transitions, respectively. Absorption spectral studies revealed that such complexes exhibit strong CT-DNA binding.



Scheme-1: Synthesis of [Cu(phen)(NNN)]Br2

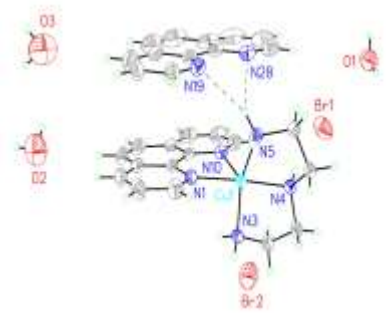


Fig. 1. The ORTEP generated diagram of [Cu(phen)(NNN)]Br_2.

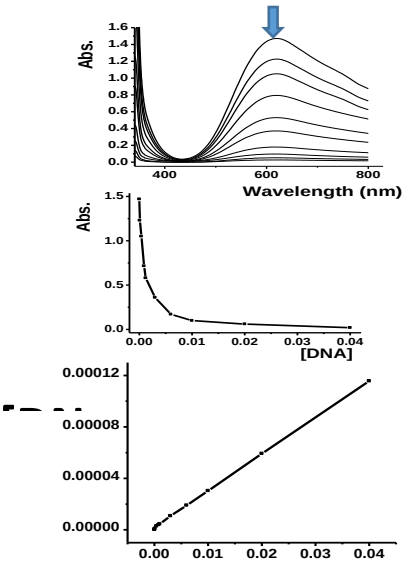


Fig. 2. a) Electronic spectral titration of complex 1 with CT-DNA at 620 nm in Tris-HCl buffer b) Absorption plot against [DNA] to confirm the exponential decreasing relation at 620 nm. c) Plot of [DNA]/(εa- εf) versus [DNA] for the absorption titration of DNA with the copper(II) complex 1.

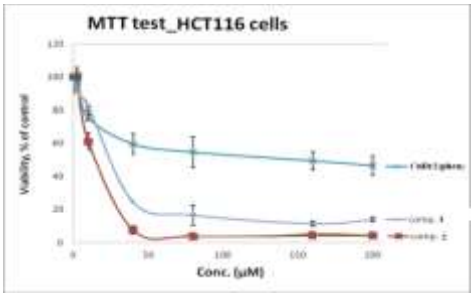


Fig. 3. MTT assay in HCT-116 colon cancer cells after an overnight treatment with various concentrations of the complexes.

Refernces

1. M. Al-Noaimi, A. Nafad, I. Warad, R. Alshwafy, A. Husein, W. H. Talib, T.Ben Hadda Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 122 (2014) 273–282. 2. M. Al-Noaimi, M. I. Choudhar, F. F. Awwadi, W. H. Talib,T. Ben Hadda, S. Yousuf, A. Sawafta, I. Warad, Spectrochimica Acta Part A: Molecular and Biomolecular Spectros-copy 127 (2014) 225–230.