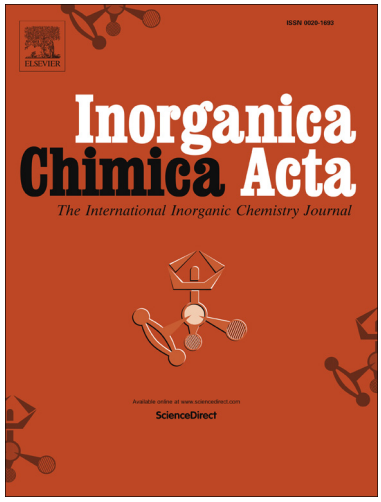

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Synthesis, DNA binding and *in vitro* cytotoxicity studies of a mononuclear copper(II) complex containing N_2S(thiolate)Cu core and 1,10-phenanthroline as a coligand

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Abstract

We report the synthesis, characterization, spectroscopic properties, redox behavior and biological activities of the Cu(II) complex [Cu(pabt)(*o*-phen)](ClO_4) (**1**), (Hpabt = *N*-(2-mercaptophenyl)-2'-pyridylmethylenimine, *o*-phen = 1,10-phenanthroline). The intense purple solution of **1** exhibits electronic spectrum with a strong LMCT band in the visible region mainly associated with S $\rightarrow$ Cu(II). It displays a four-line EPR multiplet due to the interaction of the unpaired electron with the central $^{63/65}$Cu nucleus (I = 3/2) with the A_{iso} value of 80±1.5 G at RT suggesting its monomeric nature in solution. It shows irreversible electrochemical behavior suggesting the instability of the reduced Cu(I) species. It shows catechol oxidase activity and strong intercalative DNA binding as revealed from absorption, emission spectral and viscometric studies. It exhibits strong cytotoxicity against human lung cancer A549 and epidermoid carcinoma A431 cell lines as revealed from the MTT assay. The respective IC_{50} values are: 5.26 μM for A549 and 5.41 μM for A431. The compound is found to be less toxic for the L132