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BIOLOGICAL EVALUATION OF PLATINUM SULFONAMIDO COMPLEXES: SYNTHESIS, CHARACTERIZATION, CYTOTOXICITY AND BIOLOGICAL IMAGING

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ABSTRACT

Conjugated azobenzene appended dipicolylamine ligand, N(SO2azobenz)dpa and its corresponding novel platinum complex, PtCl2N(SO2azobenz)dpa were synthesized in 98%, 80% yields respectively and characterized by using X-ray crystal data, ^{1}H-NMR, UV-Visible and IR spectroscopic methods. We report the structural data which provide indisputable evidence of the coordination between azobenzene sulfonylchloride and dipicolylamine in the formation of the ligand. Characteristic bands appear at 891 cm^{-1} and 1602 cm^{-1} due to stretching vibrations of S—N bond and asymmetric stretching vibration of N=N bonds, respectively in FTIR spectrum of N(SO2azobenz)dpa.A singlet (4.81 ppm) obtained for methylene CH2 protons in a ^{1}H NMR spectrum of the free ligand, appears as two doublets (5.39, 6.01 ppm) in the metal complex suggesting magnetically inequivalent protons upon ligand coordination to Pt. The absorption bands around 190 nm – 500 nm in UV-Visible spectra can be assigned to intra-ligand $\pi\rightarrow\pi^*$ and $n\rightarrow\pi^*$ transitions. Both ligand and the complex display intense fluorescence. Stained *Allium cepa* cells were incubated in maximum tolerable concentration(1 mg ml^{-1})of ligand, N(SO2azobenz)dpa and complex PtCl2N(SO2azobenz)dpa and observed under epifluorescence microscope. The ligand and metal complex prominently stain the cell wall and the nuclei after incubation of the compound. Significantly low IC50 values in NCI-H292 human lung cancer cells were obtained for both ligand (13.95µg ml^{-1}) and the complex (12.31µg ml^{-1}) which suggest possible use as anticancer agents.

Keywords: N(SO2azobenz)dpa, PtCl2N(SO2azobenz)dpa, ^{1}H NMR, Fluorescence, Cytotoxicity