



SYNTHESIS, STRUCTURAL AND PHOTOPHYSICAL PROPERTIES OF PLATINUM (II) SULFONAMIDO COMPLEXES OF DI-(2-PICOLYL)AMINE

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ABSTRACT

Development of effective and powerful metallopharmaceuticals as diagnostic agents and therapeutic agents is a growing body of research. In this study, two novel platinum(II) complexes [Pt(*N*(SO₂dan)dpa)Cl₂] (C1) and [Pt(*N*(SO₂bip)dpa)Cl₂] (C2) of two ligands *N*(SO₂dan)dpa (L1) and *N*(SO₂bip)dpa (L2) were synthesized in good yield and high purity. The (L2) ligand is new while (L1) ligand was previously reported but its photophysical properties and the potential of the ligand to be used as an imaging agent had not been extensively studied. The four compounds were characterized by ¹H NMR, FT-IR, UV-Vis and fluorescence spectroscopies. In ¹H NMR spectra recorded in DMSO-*d*₆, signals for the methylene protons in the free *N*(SO₂R)dpa ligands (R = dan, bip) were observed as singlets, while they appeared as two doublets in each spectrum of the metal complexes. The ¹H NMR signals obtained for the *N*(SO₂dan)dpa ligand were supported by the 2D NMR study of the ligand. Structural analysis revealed that the (L2) and (C2) compounds recrystallized in a triclinic system. The crystal structure of (C2) revealed that the ligand (L2) acts as a bidentate ligand. Upon complexation, the absorption peaks of the ligands around 260 cm⁻¹ due to pyridine-localized π→π* transitions have shifted towards shorter wavelength in the spectrum of [Pt(*N*(SO₂dan)dpa)Cl₂], while the peaks have red shifted in the spectrum of the [Pt(*N*(SO₂bip)dpa)Cl₂] complex. The emission spectra of the compounds obtained in methanol showed high fluorescent intensities for the compounds (L1) and (C1) even at very low concentrations. At higher concentrations of (L1), a drop in the fluorescence intensity could be observed possibly due to inner filter effect of the fluorophore. With the promising results obtained in fluorescence spectroscopy studies, the compounds are currently being investigated for the potential applications as cell imaging agents.

Keywords: Platinum(II) compounds, sulfonamide complexes, cell imaging agents, fluorescence studies