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# SYNTHESIS AND CHARACTERIZATION OF A NAPHTHALENE-DERIVATIZED LIGAND AND ITS RHENIUM TRICARBONYL COMPLEX TOWARDS FLUORESCENT IMAGING

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Renewed interest has been garnered in tertiary sulfonamide linear tridentate ligands and their metal complexes due to promising biomedical properties being reported in rhenium complexes bearing such ligands. In this study, a novel tertiary sulfonamide ligand (N(SO2)(2-nap)dpa) has been synthesized in good yield (78%) by utilizing di-(2-picolyl)amine (N(H)dpa) and 2-naphthalenesulfonyl chloride. The corresponding Re complex ([Re(CO)3(N(SO2)(2-nap)dpa)]PF6) was synthesized by treating the ligand with the fac-[Re(CO)3]+ core. In 1H NMR spectra of N(SO2)(2- nap)dpa and [Re(CO)3(N(SO2)(2-nap)dpa)]PF6 recorded in DMSO-d6, the peaks of the ligand were de-shielded upon metal binding and the singlet peak at 4.60 ppm for methylene protons in the ligand spectrum appeared as two doublets (5.67, 4.59 ppm) in a spectrum of the complex. The high energy absorption peaks around 200- 300 nm in UV-visible spectra may be due to intra-ligand $\pi \rightarrow \pi^*$ and $n \rightarrow \pi^*$ transitions. In an FTIR spectrum of the metal complex, the two strong absorption peaks at 2037.48 and 1912.79 cm-1 were assigned to the stretching vibrations of the metal-CO ligands. The peak at 928 cm-1 due to S-N stretching vibrations in the spectrum of the ligand has shifted to 833 cm-1 in the spectrum of the metal complex. The N(SO2)(2-nap)dpa ligand shows high fluorescence emission both in methanol and in acetonitrile. However, it was lowered in the metal complex possibly attributed to the quenching effect upon direct binding of sulfonamide nitrogen to Re metal. This novel ligand and its metal complex are currently being investigated as potential anti-cancer agents and cell imaging agents.

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**Keywords:** *anti-cancer agent, sulfonamide complexes, Rhenium tricarbonyl, fluorescent*