

11th Annual Congress on
CHEMISTRY
September 12-13, 2018 Singapore

Synthesis and characterization of a novel Naphthalene-derivatized Tridentate Ligand and its fac-Re(CO)₃L complex as potential imaging and therapeutic agents for Lung cancer

Taniya Darshani, Frank R Fronczek, Inoka C Perera and Theshini Perera
University of Sri Jayewardenepura, Sri Lanka

Organometallic compounds in medical applications is a growing body of research where Re(I) containing compounds have been studied and identified as potential anti-cancer agents and imaging agents. The aim of this study is to contribute towards finding novel drug leads. The synthesis of a novel tridentate ligand, N(SO₂)(2-nap)dienH, derived from diethylenetriamine (dien) moiety and the naphthyl group attached to the terminal nitrogen through a sulfonamide, and secondly, the net neutral fac-Re(CO)₃L complex by treating fac-[Re(CO)₃(H₂O)₃]⁺ with N(SO₂)(2-nap)dienH (71% yield) will be discussed. The compounds were characterized by X-ray crystallography, elemental analysis, ¹H NMR, FTIR, UV-Visible and fluorescence spectroscopy. The complex shows a pseudo octahedral geometry with the terminal nitrogen of the ligand being deprotonated upon binding rhenium and is further corroborated by ¹H NMR data where terminal NH signals appear as two signals orienting towards (endo-NH) and away (exo-NH) from the CO ligands. The two chelate rings of the complex have the same (λλ) chirality. The high energy band between 200-300 nm in the absorbance spectrum of the ligand has shifted to shorter wavelength in the complex and on excitation at 280 nm in methanol, emission was observed at 333 nm for the ligand and 340 nm for the complex. Illumination of *Allium cepa* bulb cells incubated with the compounds generated weak fluorescence images and displayed higher accumulation of the compounds at cell walls and nuclei. The *in vitro* cytotoxicity activity of the two compounds studied using human normal lung fibroblast cells (MRC-5) and non-small cell lung cancer cells (NCI-H-292) reveal that the complex is more toxic than the ligand towards NCI-H-292 lung cancer cells. The promising photo physical properties and cytotoxicity results of the novel synthesized compounds indicate that these compounds may be good candidates to be utilized as potential cell imaging agents as well as anticancer drug leads.

Biography

Taniya Darshani is currently pursuing her Master's degree of Philosophy at the Department of Chemistry, University of Sri Jayewardenepura, Sri Lanka and is passionate about finding novel drug leads to treat or diagnose cancer.

taniya@sjp.ac.lk

Notes: