



International Association of
Scientists
www.iasnetedu.com

Available online at www.jobiost.com

IJBLS 2023; 2(1):91-91



International Journal of
BioLife Sciences

Abstract

Organotin (IV) *N*-Ethyl-*N*-Benzyldithiocarbamates Complexes: Synthesis, Characterization, and Their Cytotoxicity against A549 Human Lung Cancer Cell Line

Nurul Amalina Abd Aziz¹, Normah Awang^{1*}, Kok Meng Chan¹, Nurul Farahana Kamaludin¹,
Nur Najmi Mohamad Anuar¹, Yee Seng Tan², Edward R. T. Tiekink², Chien Ing Yeo², Sang
Loon Tan²

¹ Center for Toxicology and Health Risk Studies, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia

² Research Centre for Crystalline Materials, School of Medical and Life Sciences, Sunway University, 47500 Bandar Sunway, Selangor Darul Ehsan, Malaysia

Received: 23 June 2023

Revised: 25 June 2023

Accepted: 7 July 2023

Abstract

Background and Aim: Organotin derivatives are promising agents which have been shown to be effective against different types of cancer cells *in vitro*. In this work, two new organotin (IV) *N*-alkyl-*N*-benzyldithiocarbamates complexes, namely dimethyltin (IV) *N*-ethyl-*N*-benzyldithiocarbamate (OTC 1), triphenyltin (IV) *N*-ethyl-*N*-benzyldithiocarbamate (OTC 2) were synthesized and screened for their cytotoxicity effects.

Method: These compounds were characterized by elemental analysis and spectroscopic (FT-IR, NMR and UV-VIS). The single crystal structure was determined by X-ray single crystal analysis. Anticancer properties of the compounds were investigated *in vitro* on the human lung carcinoma (A549) cell lines via MTT assay.

Results: The elemental analysis shows in agreement with the suggested formulae of $(\text{CH}_3)_2\text{Sn}[\text{S}_2\text{CN}(\text{CH}_3\text{CH}_2(\text{C}_6\text{H}_5)(\text{CH}_2))]_2$ (OTC 1) and $(\text{C}_6\text{H}_5)_3\text{Sn}[\text{S}_2\text{CN}(\text{CH}_3\text{CH}_2(\text{C}_6\text{H}_5)(\text{CH}_2))]$ (OTC 2). The spectral bands of FTIR showed that the thioureide bands, $\nu(\text{C}=\text{N})$ appeared in the region $1489\text{-}1426\text{ cm}^{-1}$ and $\nu(\text{C}=\text{S})$ bands in the region of $1001\text{-}997\text{ cm}^{-1}$. The ^{13}C NMR chemical shift of the NCS_2 group for OTC 1 and OTC 2 complexes were fall at 197.37 ppm and 200.80 ppm, respectively. X-ray crystallography studies showed the tetra-coordinated geometry for both compounds. OTC 1 show no significant cytotoxic activity ($\text{IC}_{50} > 100\text{ }\mu\text{M}$), whereby OTC 2 (IC_{50} : 1.58 μM) exhibit higher cytotoxicity activity toward A549 cell lines as compared to the commercial chemotherapeutic drug, cisplatin (IC_{50} : 32 μM).

Conclusion: In conclusion, triphenyltin (IV) complex can be a potential anticancer agents and further studies on the mechanism of these compounds inducing cytotoxic effects should be carried out in future.

Keywords: *Organotin (IV), Dithiocarbamate, Synthesis, Characterisation, Cytotoxicity*

***Corresponding author:** Normah Awang, Center for Toxicology and Health Risk Studies, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.

E-mail address: norm@ukm.edu.my