

**SYNTHESIS, STRUCTURES AND BIOINORGANIC
ASPECTS OF ORGANOTIN DERIVATIVES**

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ABSTRACT

Metal complexes are widely prepared and have been successfully used in the treatment of numerous human diseases including cancer. Organotin complexes are also studied due to their potential biological activities such as anticancer, antihistamine, antifungal, biocides and anti-fouling. In addition, Schiff base ligands derived from substituted salicylaldehyde and substituted 2-hydroxyacetophenone are found to be biologically active as anticancer and antimicrobial agents.

It is therefore the focus of this research project to investigate the variation of biological activity of the diorganotin Schiff base complexes in relation to their structures. In the present studies, several series of Schiff base ligands were prepared with salicylaldehyde, substituted salicylaldehyde, 2-hydroxyacetophenone and substituted 2-hydroxyacetophenone.

The diorganotin complexes were subsequently prepared by reacting the ligands with diorganotin dichloride or oxide in 1:1 molar ratio and were characterized by various spectroscopic methods including IR, NMR and UV spectroscopies. The structures of the selected diorganotin complexes were determined by X-ray crystallography and will be briefly discussed.

The *in vitro* cytotoxic activity of the Schiff base ligands and their diorganotin complexes had been evaluated against several cancer cell-lines such as HT-29, SKOV-3 and MCF-7. In general, the cytotoxic activity test showed that the diorganotin complexes had better cytotoxic activity as compared to the Schiff base ligands.

ABSTRACT

Kompleks logam banyak disediakan dan berjaya digunakan dalam pelbagai rawatan manusia, termasuk kanser. Kompleks organostanum juga banyak dikaji kerana mempunyai aktiviti biologi yang berpotensi seperti antikanser, antihistamin, anti-kulat, biosida dan anti-fouling. Ligan bes Schiff yang diperolehi daripada terbitan salisaldehid dan terbitan 2-hidroksiasetofenon juga didapati mempunyai aktiviti biologi seperti antikanser dan antimikrob.

Fokus projek penyelidikan adalah untuk mengkaji perhubungan di antara variasi aktiviti biologi bagi kompleks diorganotin bes Schiff dengan strukturnya. Dalam kerja penyelidikan, beberapa siri ligan bes Schiff telah disediakan dengan salisaldehid, terbitan salisaldehid, 2-hidroksiasetofenon dan terbitan 2-hidroksiasetofenon. Selepas itu, kompleks diorganotin disediakan daripada tindak balas ligan dengan diorganotin diklorida atau oksida dalam nisbah molar 1:1 dan dicirikan dengan pelbagai kaedah spektroskopi termasuk IR, NMR dan spektroskopi UV. Struktur beberapa kompleks diorganotin telah ditentukan dengan kristalografi X-ray dan dibincang secara ringkas.

Aktiviti sitotoksik *in vitro* ligan bes Schiff dan kompleks diorganotin telah dicirikan dengan beberapa sel kanser seperti HT-29, SKOV-3 dan MCF-7. Secara umum, kajian aktiviti sitotoksik menunjukkan bahawa kompleks diorganotin adalah lebih baik berbanding dengan ligan bes Schiff.

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