

## Performance Study of Organotin (IV) Complexes

Emad Yousif\*, Hanan Ibraheem, Mustafa Ismael, Dina S. Ahmed

Department of Chemistry, College of Science, Al-Nahrain University, Iraq

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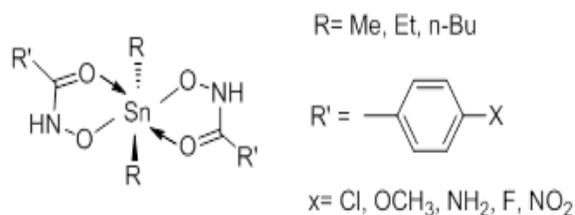
\***Corresponding Author:** Emad Yousif, Department of Chemistry, College of Science, Al-Nahrain University, Baghdad 10072, Iraq [emad\\_yousif@hotmail.com](mailto:emad_yousif@hotmail.com)

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Organotin(IV) complexes possess at least one covalent carbon to organotin bond as part of its structural characteristics [1]. It also contains tin in a +4 oxidation state bonded to donor atoms of a number of ligands. They have received a lot of research interests due to their structural diversity and numerous applications [2]. Organotins are the most widely used organometallic compounds globally ( $\sim 50,000 \text{ t yr}^{-1}$ ) [3] with applications in the stabilization of plastics, precursors in glass coating and as antifungal agents in textiles and other household items [4]. From the 1950s-2001, the major use of tributyltin (TBT) and triphenyltin (TPhT) was as a toxicant in antifoulant paints [4].

A series of tri-alkyl/acyl-substituted-organotin(IV) complexes: tri-n-butylorganotin, tricyclohexylorganotin, and triphenylorganotin compounds are used as biocides for agricultural and industrial applications; and as antifouling agents and disinfectants for surface materials [5]. Similarly, triorganotin(IV) complexes are used as catalysts in some synthetic reactions like the production of polyurethanes [6]. organotin(IV) compounds form a widely studied class because of their apoptotic inducing character[7,8]. Organotin(IV) compounds exhibit remarkable anti-tumor, antibacterial, anti-viral, anti-inflammatory and anti-tuberculosis activities [9]. Recently, many researchers have reported the cytotoxic effects of organotin(IV) compounds against

various cancer cell lines, including human tumor cell lines [10]. One more advantage of these compounds is that they are useful in overcoming the multidrug resistance generally associated with chemotherapeutic treatment by other metal based drugs [9]. Despite their promising activity against a wide range of tumors, organotin(IV) compounds-related studies have failed to reach the clinical trials due to their severe neurotoxicity [11], the mechanism of which is still a mystery [12]. However, their extraordinary anti-cancer activity surmounts their negative effects [13]. The mode of diorganotin(IV) complexes binding and its derivatives.



Organotin(IV) compounds are known to display significant Lewis acid characteristics and expand their coordination number via interactions with non-bonding electron pairs of atoms. Thus, these compounds have additional ligands and intramolecular coordination or association to produce dimers, oligomers, or polymers [14].

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