

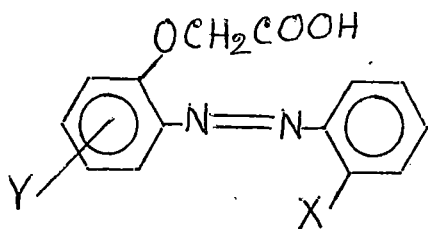
P R E P A R E

The Lewis acidity or the acceptor strength of the tin atom in organotin compounds depends on the number of organic groups attached to the tin atom. The acceptor strength decreases in the sequence $\text{SnX}_4 \gg \text{R}_3\text{SnX}_3 \gg \text{R}_2\text{SnX}_2 \gg \text{R}_3\text{SnX} \gg \text{R}_4\text{Sn}$ ($X = \text{electronegative substituent}$). Thus, tetra organotin compounds hardly form any molecular complexes, the triorganotin compounds generally form 5 co-ordinate complexes; 6-co-ordination is more common with diorganotin or mono organotin compounds and even examples of 7 coordinate complexes are well known in the later case.

Although triorganotin compounds generally form 5-co-ordinate complexes, a number of 6-co-ordinate chelates using (arylate)benzoates as ligands have been recently prepared. Though a few potentially 7 co-ordinate addition complex of the type $\text{R}_3\text{SnX} \cdot \text{L}$ ($R = \text{Ph or Me}$; $X = \text{Cl or SO}_3$; $L = 3\text{-}\left[2\text{-(1,10-phenanthrolyl)}\right]\text{-5,6-dimethyl-1,2,4-triazine}$ and $3\text{-}\left[2\text{-(1,10-phenanthrolyl)}\right]\text{-5,6-diphenyl-1,2,4-triazine}$) have been reported, example of 7 co-ordinate chelates of triorganotin derivative of the R_3SnX ($L = \text{tetradentate ligand}$) has been hitherto unknown.

(IV)

The rather low acceptor strength of the tin atom attached to three organic group disfavors formation 7-co-ordinated chelates unless of course, a sterically favourable environment is created with suitably designed ligand. The case with which 6-co-ordinated triorganotin chelates of O-(2-hydroxy benzene azo)benzoic acid were prepared in this laboratory, led us to believe that I would be a good tetradentate ligand for our purpose.

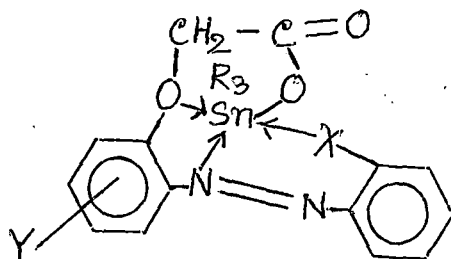


X = OH, F, Cl etc.

I

With appropriate choice of the diazo and coupling components such ligands could be synthesized without great difficulty. Esterification of the carboxyl group by triorganotinanyl group may then be expected to lead to the desired chelates (II) under favourable conditions.

(V)



II

The present thesis describes the results of our studies aimed at synthesizing hitherto unknown 7-co-ordinate triorganotin chelates.

The thesis is divided into four chapters. The first and second chapters provide the back ground material with a review of organotin chemistry in general and organotin complexes and carbonylates in particular.

Synthetic procedure, analytical data and infrared spectra are discussed in chapter III while the electronic absorption spectra are discussed in the last chapter where evidence in favour of 7-co-ordinate complex of type (II) are presented.