SUMMARY

During the last few years extensive research activities are being noticed on different aspects of organotin co-ordination complexes with different ligands like β -diketones, 8-hydroxy quinoline, oximes and hydroxamic acids etc. The present investigation is concerned mainly with the synthesis of different types of organotin co-ordination complexes with the aid of the bidentate versatile chelating agent, diphenyl thiocarbazone (Dithizone)and their characterisation by analytical, UV and IR , N.M.R. spectral data.

In the beginning, a very short introduction of organotin compounds has been presented, followed by a brief description on the nature of bonding and other related properties required to explain the chemical behaviour of organotin compounds in a general way. Next the preparation and properties of some known organotin complex compounds have been discussed. These include organotin adducts formed from mono-, di- and tri organotin compounds; organotin acetylacetonates and other β -diketonates; organotin oximates and substituted hydroxamates; organotin oxinates; Organotin tropolonates, kojates, dithiocarbamates and xanthates; organotin derivatives of (Aryl azo) benzoic acids and Schiff bases.

After this short review, experimental details of the present investigation have been given. First, the preparation of some known compounds which have been required for the present investigation have been given. These were prepared by standard procedure and modified where necessary.

Four types of organotin co-ordination complexes of dithizone have been synthesised e.g. $R_3Sn(HDz)$ (R = Ph, Bu, Pr and H_2Dz = dithizone), $R_2Sn(HDz)_2$ (R = Ph, Bu, Pr, Me, Benzyl, P-tolyl), $R_2SnX(HDz)$ (R = Ph, Bu, Me, Bz, P-tolyl; X = Cl, Br, I, SCN) and RSnXL(HDz) (R = Ph; X = Cl, I ; L = N-phenyl benzohydroxamate and H_2Dz = dithizone). Most of these compounds are beautifully crystallinedand brightly coloured. They could be purified to have a sharp melting point. Besides these, three mixed chelates of the RSnXLL' type have been synthesised (R = Ph, X = Cl, I; L = N-phenyl benzohydroxamate, N-orthotolyl Benzo hydroxamate and L' = Oxine).

Triorganotin dithizonates and diorgano tin bis-dithizonates have been prepared either by refluxing the appropriate oxide with dithizone in 1:2 molar ratio in chloroform solution for about an hour and then crystallising from chloroform-methanol mixture or by the reaction of appropriate organotin halides and dithizone (in 1:1 molar ratio for triorgano tin dithizonates and 1:2 molar ratio for diorgano tin bis-dithizonates) and neutralising the liberated hydrogen halide by concentrated ammonia solution.

Diorganotin halo dithizonates have been prepared either by disproportionation reaction of diorganotin dihalide and diorganotin bis-dithizonates or by the reaction of diorganotin dihalide and dithizone in 1:1 molar ratio and neutralising the liberated hydrogen halides with concentrated ammonia solution.

$PhSnXLL'$ complexes have been synthesised by the reaction of dimeric phenyl halo methoxy tin N-phenyl benzohydroxamate and dithizone or oxine.

Elemental analytical data of the new compounds suggest the molecular composition of these. The electronic, NMR and IR spectra of these compounds have been recorded. These spectra indicate the strong chelating nature of dithizone in these complexes. From the elemental analysis and spectral data the structures and nature of bonding of the organotin dithizonates have been suggested.

Spectrophotometric investigations show that organotin dithizonates are not stable in different organic solvents. Thier stabilities depend on the nature of solvents and presence of light. They undergo deterioration in non polar solvents like carbon tetrachloride and cyclohexane and as well as in polar solvent like methanol. They undergo also photochemical decomposition in organic solvents. The formation of 1,5 diphenyl formazan-3-yl-disulphide has been suggested in almost all cases as one of the products in deteriorated solution of organotin dithizonates.