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SHORT COMMUNICATION

CETONIZATION, DESARYLATION AND ESTERIFICATION IN THE INTERACTIONS BETWEEN $PhPO_3H_2$ AND $SnPh_3Cl$: SYNTHESIS OF $OC[OPOSnPh_3OEt]_2$ AND INFRARED STUDY

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Abstract: On allowing $PhPO_3H_2$ to react with $SnPh_3Cl$ in ethanolic media, $OC[OPOSnPh_3OEt]_2$ is obtained by cetonization, desarylation and esterification, has been studied by infrared technic. A discrete structure has been suggested on the basis of infrared data, the anion behaving as a bidentate ligand, the environment around the tin centres being tertrahedral.

Keywords: *bidentate, cetonization, desarylation and infrared, hydrogen bonds, phosphonate, $SnPh_3$ residue, supramolecular architectures, tetrahedral environment*

INTRODUCTION

Because of the various applications found within the organotin (IV) family[1 - 3], our group have been involved in seeking new organo- and halotin (IV) molecules and have reported several papers dealing with[4 - 8]. In this study we have initiated the study of the interactions between $PhPO_3H_2$ and $SnPh_3Cl$ which has yielded the title compound which structure has been determined.

MATERIALS AND METHODS

On allowing $PhPO_3H_2$ to react with $SnPh_3Cl$ in ethanolic media in 1/1 steochiometry a powder is obtained after a slow solvent evaporation. Its analytical data have allowed to suggest **$OC[OPOSnPh_3OEt]_2$[A]:** C = 52.16(53.24), H = 4.27 (4.87) as formula.
The reaction giving A is:

$$2PhPO_3H_2+2SnPh_3Cl+2EtOH+CO_2 \longrightarrow O=C(POOSnPh_3OEt+2HCl+2H_2O+2C_6H_6+O_2$$

In this reaction we can consider that two molecules of $PhPO_3H_2$ have being involved in a cetonization giving *in situ* $O=C(PO_3H_2)_2$ which reacts with two molecules of $SnPh_3Cl$ and two molecules of EtOH by esterification.
The infrared spectrum was recorded at the "Institut de la Matiere Condensee, University of Bordeaux, France" by means of a spectrometer Nicolet 6700 FT-IR, the sample being as Nujol mulls using CsI windows. Infrared data are given in cm^{-1} (abbreviations: (vs) very strong, (s) strong, (m) medium, (w) weak), (vw) very weak, d (doublet). All the chemicals were purchased from ALDRICH Company and used as such.

RESULTS AND DISCUSSION

Let us consider the ir data of the derivative: $\nu C=O$ = 1718(vs); νPO_3 = 1088(s), 1068(s), 1039(s); δPO_3 = 693(s); νPC = 743(m).
The C=O group appears as a strong band at 1718 cm^{-1}; its presence indicates a cetonization. The presence of $SnPh_3$ is well characterized by the presence of a medium triplet between 997 and 1045 cm^{-1} and by a very strong doublet between 710 and 690 cm^{-1}.The stretching vibrations of the PO_3 group appear as a very strong absorption with several components in the 1088 - 1039 region while the deformation modes are assigned to the strong band at 743 cm^{-1}.
The derivative $OC[OPOSnPh_3OEt]_2$ has a discrete structure with monocoordinated $SnPh_3$ residues: it has been obtained by a process of cetonization leading to a dimeric form of the starting acid; the anion $[O=C(PO_3Et)_2]$ behaves as a bidentate ligand, the structure is reported on Figure 1.

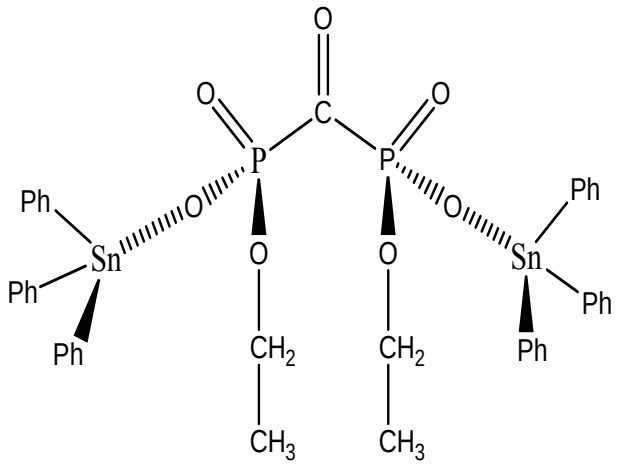

Figure 1. *Proposed structure for* $OC[OPOSnPh_3OEt]_2$

CONCLUSION

The studied derivative has a discrete structure with monocoordinated $SnPh_3$ residues and has been obtained by a process of cetonization, desarylation and esterification leading to a dimeric form of the starting acid; the anion behaves as a bidentate ligand.

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