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SHORT COMMUNICATION

AMINOPHENYL ARSENIATO ADDUCTS AND DERIVATIVES OF SnR_2Cl_2 (R = Ph, Bu): SYNTHESIS AND INFRARED STUDY

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Abstract: Four new phenylarseniato adducts and derivatives have been synthesized on allowing SnR_2Cl_2 (R = Ph, Bu) to react with $Cy_2NH_2.NH_2PhAsO_3H.3/2H_2O$ in specific ratios. The obtained new tin (IV) compounds were studied by infrared, infinite chain and discrete structures were suggested on the basis of spectroscopic data, the oxyanion behaving as a bridging bidentate or a tridentate ligand. When secondary interactions are involved supramolecular architectures were obtained.

Keywords: *coordinating phenylarseniato, SnR_2 residue, infrared, infinite chain and discrete structures, supramolecular architectures*

INTRODUCTION

Evans and Karpel have summarized the main applications found in organotin (IV) family (medicine, agriculture, antifouling paints, and wood preservatives) [1]. This explains the focus of many teams involving our [2-18] in seeking new molecules for widening the family, expecting some applications, and for structural aspects too. Our group initiates here the study of the interactions between $Cy_2NH_2.NH_2AsO_3H$ and $SnPh_2Cl_2$ and $SnBu_2Cl_2$ which has yielded four new adducts and derivatives, infrared study of which has been carried out then structures suggested on the basis of spectroscopic data.

EXPERIMENTAL

$Cy_2NH_2.NH_2PhAsO_3H.3/2H_2O$ (**A**) has been obtained on partially neutralizing $NH_2PhAsO_3H_2$ with Cy_2NH in water and allowing the water to evaporate at 60 °C. On mixing an ethanolic solution of (**A**) with $SnPh_2Cl_2$ or $SnBu_2Cl_2$ in specific ratios, precipitation occurs. The precipitate were stirred around two hours and filtered. The analytical data % Calculated (% Found) reported below have allowed to suggest the following formula.

Table 1. *Results of the elemental analyses*

Compound	Chemical formula	Elemental analysis (%)					
		C		H		N	
		calc.	found	calc.	found	calc.	found
B_1	$NH_2PhAsO_3H.SnPh_2Cl.2EtOH$ (2/1)	40.05	39.32	5.42	6.06	2.12	1.88
B_2	$(Cy_2NH_2)_2NH_2PhAsO_3.3SnBu_2Cl_2.H_2O$ (1/2)	42.72	42.62	7.26	7.03	2.77	3.04
B_3	$(Cy_2NH_2)_2NH_2PhAsO_3.2SnPh_2Cl_2.Cy_2NH_2Cl.2(EtOH)(1/1)$	53.57	54.62	7.01	8.12	3.53	3.85
B_4	$NH_2PhAsO_3(SnPh_2Cl)_2.2H_2O$ (1/2)	41.50	42.00	3.45	4.73	1.61	1.56

The elemental analyses have been performed by the Laboratory of Microanalyses-University of Montpellier II-France The infrared spectra have been recorded at the University of Padova-Italy- by means of a Perkin Elmer spectrometer using CsI, the sample being as Nujol mulls. Infrared data are given in cm^{-1} (IR abbreviations: (vs) very strong, (s) strong, (m) medium, (w) weak, (br) broad). All the chemicals were purchased from Aldrich-Germany- and used as such.

RESULTS AND DISCUSSION

Let us consider the IR data of **B_1-B_4**:
(B_1) = νsOH:429(br); νsNH_2:2425(m); δNH_2:1212(s); ρNH_2:1212(s); νsAsO:868(vs); δAsO:445(vs); $\nu sSnPh_2$:272(m);

(B_2) = νsOH:3400(s); νsNH_{2cat}:2525(s); νsNH_{2an}:2425(m); δNH_{2cat}:1622(m); δNH_{2an}: 1596(s); ρNH_2:1223(w); νsAsO:849(vs); $\nu asSnBu_2$:743(s); $\nu sSnBu_2$:609(m);
(B_3) = νsOH:3400(br); νsNH_{2cat}:2525(s); νsNH_{2an}:2425(m); δNH_{2cat}:1622(m); δNH_{2an}: 1596(s); ρNH_2:1223(w); νsAsO:890(vs); $\nu sSnPh_2$:273(s);
(B_4) = νsOH:3300(br); νsNH_2:2400(m); δNH_2:1650(s); ρNH_2:1220(s); νsAsO:880(vs); δAsO:440(vs); $\nu sSnPh_2$:270(m);

$SnBu_2$ appears as a weak bond allowing us to conclude to linearity for this compound. Therefore we can suggest the discrete structures reported on Figure 1, 2, 3 and 4.

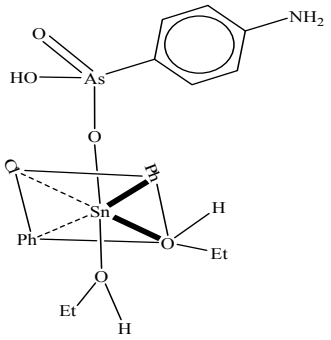

Figure 1. *(B_1)*

This structure is discrete with a monocoordinating anion, the environment around the tin (IV) centre being octahedral. The ethanol molecules are coordinating ones.

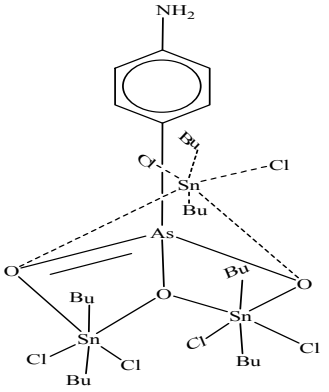

Figure 2. *(B_2)*

This structure is discrete with a trichelating anion, the environment around the tin (IV) centers being octahedral with the butyl groups in *trans* positions.

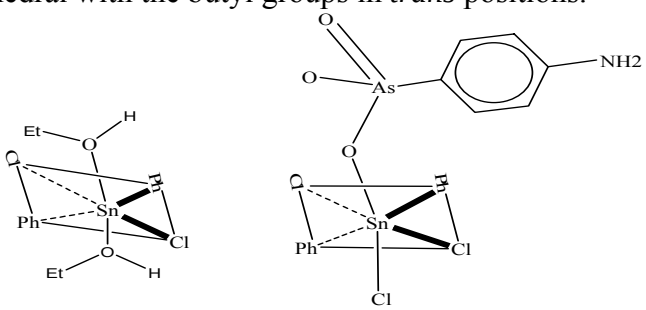

Figure 3. *(B_3)*

This compound is a 1/1 adduct between $SnPh_2Cl_2.2H_2O$ and $(Cy_2NH_2)_3NH_2PhAsO_3.SnPh_2Cl_3$**;** it has an ionic structure with two metallic components (an anionic one and a neutral component), the tin (IV) centers being in an octahedral environment. The anion is a monocoordinating ligand, the water molecules being coordinated to the tin (IV) centre.

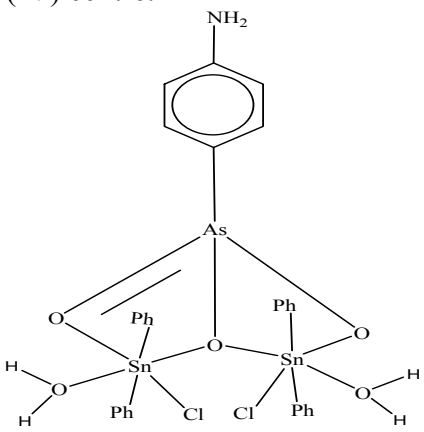

Figure 4. *(B_4)*

CONCLUSIONS

This compound has a discrete structure with a bichelating oxoanion, the environment around the tin centres being octahedral.The water molecules are coordinated ones.
When cations or OH groups are involved in NH- - -O, NH- - -Cl or OH- - -Cl hydrogen bonds, supramolecular architectures are obtained for all the structures.

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