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SHORT COMMUNICATION

$Me_4NSO_4SnI_3$: SYNTHESIS AND INFRARED STUDY

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Abstract: Allowing $(Me_4N)_2SO_4 \cdot 2H_2O$ to react with SnI_4, yields $Me_4NSO_4SnI_3$. Its IR study allowed suggesting an infinite chain structure, the environment around the Sn(I)V center being trigonal bipyramidal.

Keywords: *infinite chain structure, IR, spectroscopy, sulphato adduct, trihalotin (IV)*

INTRODUCTION

Our interest for halotin (IV) compounds is related to various applications found for tin (IV) compounds [1]. Many papers dealing with SnX_4 adducts have been already published [2 – 6]. We initiate here the study of interactions between $(Me_4N)_2SO_4{\cdot}2H_2O$ and SnI_4 which has yielded the studied compound, infrared study of which has been carried out then a structure suggested from these obtained data.

EXPERIMENTAL

When $(Me_4N)_2SO_4{\cdot}2H_2O$ is allowed to react with SnI_4 in 1 : 2 ratio, as ethanolic solutions, a brown precipitate is obtained after stirring no less than two hours. Analytical data, % Calculated (% Found): C = 07.16 (07.20); H = 01.79 (01.82); N = 02.09 (02.08); I = 56.83 (56.67). Its analytical data allowed suggesting the following formulae: $Me_4NSO_4SnI_3$.
The reaction equation is:

$$(Me_4N)_2SO_4{\cdot}2H_2O + SnI_4 \rightarrow Me_4NSO_4SnI_3 + Me_4NI + 2H_2O$$

All the chemicals purchased from Aldrich Company were used without any further purification. The IR spectra were recorded by a Perkin Elmer 580 (4000 – 200 cm^{-1}) or a FTIR-Nicolet (600 – 50 cm^{-1}) spectrometer at the University of Padova (Italy), the sample being as Nujol mulls while CsI or polyethylene windows were used. Abbreviations: (vs) very strong, (s) strong, (m) medium, (sh) shoulder.

RESULTS AND DISCUSSION

Let us consider the more relevant IR anion bands and their assignments: 1265 m; 1128 m; 1015 m (ν_3); 920 m (ν_1); 630 m; 615 m; 597 m (ν_4); 478 m (ν_2).
These data allow concluding to C_{2v} point group for sulfate. ν SnI_3 is localized as a strong band at 170 cm^{-1} and νSn-O at 240 cm^{-1} as medium band.
This allows suggesting an infinite chain structure as the one reported by Rosenland *et al.* [7] for the $Bu_4NWO_4SnMe_3$ and $Bu_4NMoO_4SnMe_3$ derivatives, similar by their formulae to our studied derivative, the environment around the tin (IV) centre being trigonal bipyramidal, the sulfate anion behaving as bidentate bridging ligand (Figure 1).
All our attempts to obtain monocrystals were unsuccessful.

CONCLUSION

The studied derivative has a chain structure, the environment around the tin IV center being trigonal bipyramidal.

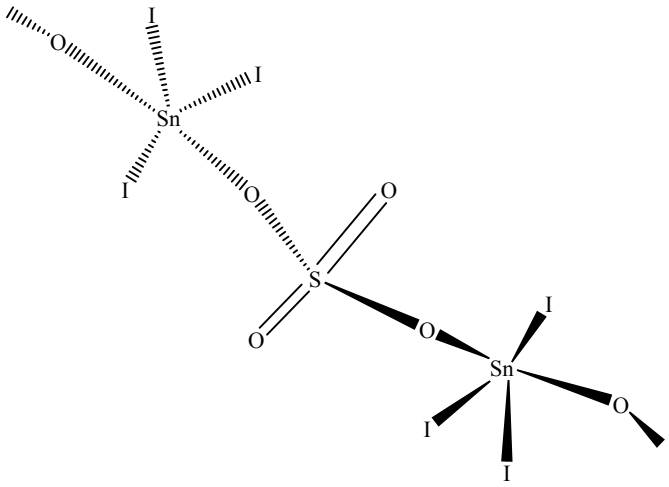

Figure 1. *Infinite chain structure for $Me_4NSO_4SnI_3$*

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