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Note

Mössbauer Data and NMR Spectra for Some Organotin Compounds*

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Mössbauer parameters have been obtained for some organotin oxides of the general formula Me_2SnMO_4 (M=Mo, W, Cr, C; Me=CH_3). The observed parameters for some $SnCl_4 \cdot 2A$ compounds, where A represents various types of electron donating molecules, are also given. The proton NMR shifts and coupling constants for *para*-$XC_6H_4SnMe_3$ compounds (X = MeO, Me, Cl, Br, NMe_2) are presented.

INTRODUCTION

Recently the bonding in a quite few organic tin compounds has been the object of the study by means of Mössbauer spectroscopy[1,2]. A number of rather surprising and unexpected results have emerged and also very many questions still remain to be answered, but these are not considered here. Thus for example, the presence, magnitude, and nature of $p_\pi - d_\pi$ (or $p_\pi - p_\pi$?) interactions in tin is seriously questioned[5].

The object of this note is to report briefly on some Mössbauer and NMR results for two different series of organotin compounds.

RESULTS

All the spectra were recorded in a manner previously described[3,4]. All the compounds were prepared according to already published methods. Also all the measurements were made with the absorber at liquid nitrogen temperature. The isomer shifts are given with respect to grey tin as absorber reference. In Table I results are presented for the oxide series of compounds. Equally, NMR results for *para*-$XC_6H_4SnMe_3$ compounds are listed in Table II

TABLE I

Isomer Shifts and Quadrupole Splittings for Oxides

Compound	Shift (mm sec^{-1}; ± 0.05)	Quadrupole splitting (mm sec^{-1} ± 0.05)
1. Me_2SnWO_4	— 0.71	3.53
2. Me_2SnMoO_4	— 0.68	4.10
3. $Me_2SnOMe_2SnCrO_4$	— 0.82	2.98
4. $Me_2SnC_2O_4H_2O$	— 0.55	4.65

* Taken from a thesis submitted for a M. Sc. degree of the University of Birmingham

temperature. The isomer shifts are given with respect to grey tin as absorber Finally, Mössbauer data for adduct compounds are given in Table III. The accuracy of the measurements is ± 0.05 mm sec^{-1} and ± 0.01 c/sec for Mössbauer and NMR results, respectively.

TABLE II

NMR Data for the Compounds of para-$XC_6H_4SnMe_3$ *Series**

X in *para* $XC_6H_4SnMe_3$	$SnMe_3$ (ppm ± 0.01)	X (ppm ± 0.01)	JSn^{119}—Me (cps ± 0.01)	JSn^{117}—Me (cps ± 0.01)
1. MeO	9.755	6.27	55.1	52.7
2. Me	9.749	7.69	55.0	52.7
3. Cl	9.720	—	55.4	53.1
4. Br	9.725	—	54.9	52.4
5. Me_2N	9.778	7.10	54.4	52.1

* These spectra were recorded and analysed by Dr. E. Mooney using Varian A 60 Spectometer. Chemical shifts were measured with respect to $(Me_3)_4Si$.

TABLE III

Isomer Shifts and Quadrupole Splittings in Some $SnCl_4$ *Adducts*

Compound	Shift (mm sec^{-1} ± 0.05)	Splitting (mm sec^{-1} ± 0.05)
1. $SnCl_4$ bipy	— 1.62	—
2. $SnCl_4$ 2 $P(C_6H_5)_3$	— 1.48	—
3. $SnCl_4$ 2 Et_2O	— 1.61	1.20
4. $SnCl_3(EtO)(EtOH)$	— 1.76	—
5. $SnCl_4$ 2 (Me_2SO)	— 1.76	—

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IZVOD

Mössbauerovi rezultati i NMR spektri za neke organske spojeve kositra

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Mössbauerovi parametri su dobiveni za neke organske okside kositra sa općtom formulom Me_2SnMO_4 (M=Mo, W, Cr, C). Dati su također parametri za $SnCl_4 \cdot 2$ A tip spojeva (A označava elektron donorsku grupu).

Izmereni su protonski NMR pomaci za jedinjenja tipa *para*-$XC_6H_4SnMe_3$ (X=MeO, Me, Cl, Br, NMe_2).

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