

## Preliminary communication

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### Sulphinylaminotin compounds

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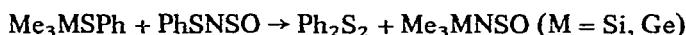
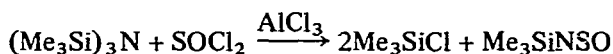
(Received August 18th, 1972)

#### SUMMARY

The metathetical exchange reaction between tin alkoxides and aminosilanes has been used to prepare the first sulphinylaminotin compounds, which will sulphinylate chlorosilanes, giving notably bis(sulphinylamino)dimethylsilane.

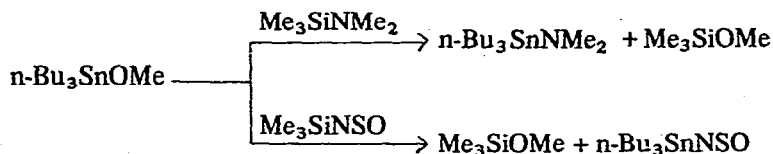
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Sulphinylamine derivatives of organic amines<sup>1</sup> and hydrazines<sup>2</sup> have been known since the last century. However, it was not until 1966 that the first sulphinylamine of other Group IV elements was prepared<sup>3</sup>. This involved the reaction of thionyl chloride and tris(trimethylsilyl)amine. Four years later, a method involving the formation of disulphides was successfully applied to sulphinylaminotrimethylgermane<sup>4</sup>.

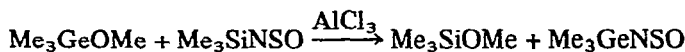


To date, no sulphinylaminotin compounds have been reported, and bis(sulphinylamino)-sulphide,  $\text{S}(\text{NSO})_2$ , is the only compound known with two of the functional groups on the one atom<sup>5</sup>. This note reports the preparation of sulphinylaminotin compounds and bis(sulphinylamino)dimethylsilane.

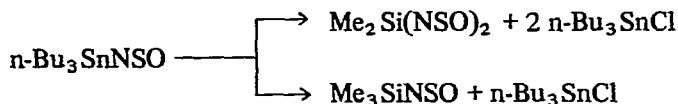
The facile exchange between aminosilanes and tri-*n*-butyltin methoxide gives tin amines in high yield. This exothermic reaction has been successfully applied to the synthesis of sulphinylaminotri-*n*-butyltin, using the sulphinylaminosilane mentioned above. The product is a high boiling, pale yellow liquid with two peaks in its infrared spectrum at 1260 and 1090  $\text{cm}^{-1}$  characteristic of the sulphinylamino group.



Good yields of sulphinylaminotrimethyltin result using trimethyltin ethoxide. Like the n-butyl homologue it is a pale yellow liquid, boiling at  $62^\circ/10$  mm with  $n_D^{25}$  1.5141 and a single peak in the PMR spectrum centred at  $\tau$  9.63 with  $J(^{117}\text{Sn}-\text{C}-\text{H})$  and  $J(^{119}\text{Sn}-\text{C}-\text{H})$  60.0 and 62.7 cps. Sulphinylaminotrimethylgermane can be prepared by the same method, but the reaction requires the use of aluminium chloride as a catalyst.



Lappert<sup>6</sup> has reported that dimethylaminotrimethyltin will aminate various covalent fluorides and chlorides, notably chlorotrimethylsilane. Dimethylaminotri-n-butyltin behaves likewise with this and dichlorodimethylsilane, to give the corresponding aminosilanes. With sulphinylaminotri-n-butyltin and these chlorides, good yields of both sulphinylaminotrimethylsilane and the bis(sulphinylamino)silane  $\text{Me}_2\text{Si}(\text{NSO})_2$  result.



The latter is a bright yellow liquid with a sweet sickly smell. It shows a single peak in the PMR spectrum at  $\tau$  9.38, while intense infrared absorptions at around 1300 and 1100  $\text{cm}^{-1}$  support the presence of the sulphinylamino groups, and boils at  $54^\circ/7$  mm,  $n_D^{25}$  1.4787.

#### EXPERIMENTAL

While all reactions were conducted in a moisture free atmosphere, those involving the tin compounds involved the exclusion of  $\text{CO}_2$  as well. All the reactions were clean, giving yields of the products in excess of 65%.

The authors thank the College for support.

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*J. Organometal. Chem.*, 44 (1972)

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