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Preliminary communication

The polymeric structure of the adduct of dimethyltin dichloride with bis(salicylaldehyde) ethylenediimine.

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SUMMARY

Crystal structure analysis has shown the title compound to have a polymeric structure with the Schiff base acting as oxygen-bridged bidentate ligand.

Recently 1/1 adducts, formed by mono- di- and tri-organotin(IV) halides with potentially tetradentate bases have been prepared[1], and studied[2] by means of IR and Mössbauer spectroscopy. On the basis of such results for the $Me_2SnCl_2 \cdot AcacenH_2$ [$AcacenH_2$ = bis(acetylacetone)ethylenediimine], a polymeric structure was proposed for the co pound in the solid state, in which the $AcacenH_2$ ligand acts as bidentate ligand, bridging octahedral tin atoms of the Me_2SnCl_2 group having a *trans*-dimethyl, *trans*-dichloro arrangement. It was not possible to decide, however, whether the neutral ligand was bonded through nitrogen and/or oxygen atoms.

An analogous adduct in which the Schiff-base is bis(salicylaldehyde)ethylenediimine ($SalenH_2$) gives yellow crystals suitable for an X-ray analysis, although all those examined were found to be slightly reflection twins. This significantly lowers the accuracy of the atomic parameters (see the R value), but since the main interest is in the elucidation of the overall structure, one of the crystals was used for the diffraction data collection. The crystal was enclosed in a thin-walled glas capillary because they loose crystallinity if left in the air

Crystal data. $C_{18}H_{22}N_2O_2Cl_2$, monoclinic, space group $P2_1/c$ with a=9.535 b=16.457 c=14.052Å and β 67.9°, Z = 4. The 1997 independent reflections, with $I/\sigma(I) \geqslant 3$, were collected on a Siemens automatic diffractometer using Mo-K_α radiation. The structure, solved by conventional Patterson and Fourier methods, was refined by the block-diagonal least-squares method to a conventional R-factor of 0.14, using isotropic temperature factors for all the atoms.

The structure of $Me_2SnCl_2 \cdot SalenH_2$ in the solid state consists of polymeric chains held together by Van der Waals forces. The $SalenH_2$ molecules bridge the Me_2SnCl_2 units, which have *trans*-dimethyl, *trans*-dichloro geometry, and coordinate to the tin atoms through their oxygen atoms. The chain is shown in Fig. 1 together with some bond lengths. It is probable that the $Me_2SnCl_2 \cdot AcacenH_2$ adduct has the corresponding structure.

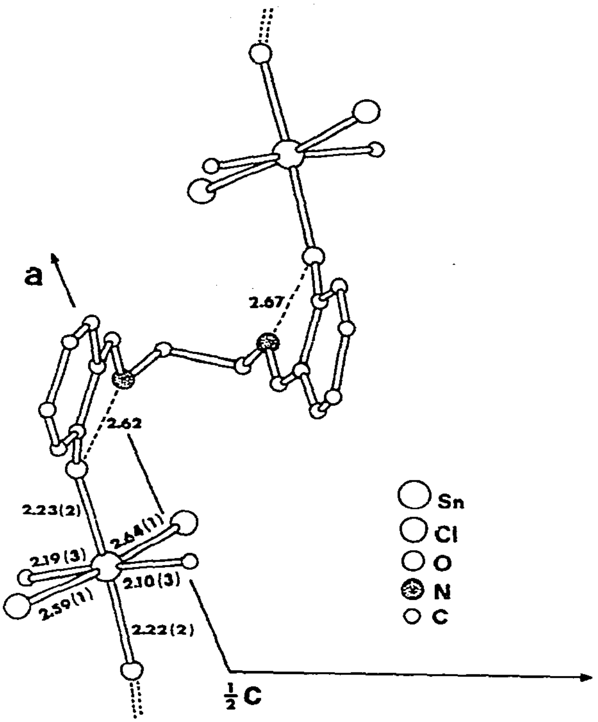

Fig. 1. A view of the polymeric chain projected along the b axis. The e.s.d. for the bond lengths are given in parentheses.

The octahedral coordination around the tin atom is almost regular. The coordination bond angles, involving the equivalent *trans*-ligands, range from 175 to 177°, the other angles being in the range 82 to 100°. The Sn—O bond lengths of 2.22 and 2.23Å are very close to those found in the $Me_2Sn^{IV}Salen$[4] of 2.22(2) and 2.25(2)Å, although in the latter compound the Schiff-base behaves as a dianionic ligand. The non-coordinated nitrogen atoms of $SalenH_2$ ligand are involved in hydrogen bonds with their nearby oxygen atoms (see Fig.1), with N••••O distances of 2.62 and 2.67Å.

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