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## Esters van tetrathioorthotinzuur

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## SUMMARY.

Claesson claims to have obtained the tetraethyl ester of tetra-thioorthostannic acid by shaking an aqueous solution of stannic chloride with ethylmercaptan and by distilling the heavy oily product. This could not be confirmed.

A mixture of different products is formed, containing possibly among others the tetraester. Even distillation under very low pressure did not give pure products.

Three methods for preparing the esters of tetrathioorthostannic acid were elaborated, viz.:

1<sup>o</sup>. reaction of stannic chloride with a suspension of sodium mercaptide in benzene.

2<sup>o</sup>. reaction of stannic chloride with sodium mercaptide in alcoholic solution, obtained by adding mercaptan to an alcoholic solution of sodium.

3<sup>o</sup>. reaction of stannic chloride, dissolved in benzene, with a benzene solution of mercaptan in the presence of sodium carbonate.

The first of these three methods is the best one. In this way several esters were obtained with a yield varying from 50 to 70%. The two other methods were only used for the preparation of the methyl ester.

The aliphatic esters are liquids, except the methyl, tert. butyl, tert. amyl, dodecyl and cetyl esters. The aromatic esters are crystalline, yellow products. They have the smell of the corresponding mercaptans, which is due to partial decomposition.

Noteworthy is the high melting point of the tert. butyl ester (188°), which shows the characteristic properties of „filled molecules“. The less symmetrical tert. amyl ester melts at 44°.

Oxidation of the esters did not give sulfones. The carbon-sulphur bond was broken and stannic oxide and dialkyldisulphide were formed.

Methyl iodide did not give an addition product. The reaction with mercuric chloride yielded  $\text{HgCl}(\text{SR})$  with decomposition of the ester.

Crystals of the tert.butyl and the cyclohexyl ester of tetra-thioorthostannic acid were measured. They show a very great resemblance to those of the corresponding esters of tetra-thioorthosilicic acid and of tetrathioorthogermanic acid.

Finally, an attempt was made to prepare tetramercaptides of lead by means of interaction of lead tetrachloride and a suspension of sodium mercaptide in benzene. A yellow product was obtained; several analyses led to the conclusion, that the first product was the tetramercaptide, which rapidly decomposed into lead dimercaptide and dialkyldisulphide.

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