REACTION BETWEEN TRIMETHYLTIN HYDROXIDE AND METHYLIODIDE.

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Some years ago[1] the author noticed that a beautiful crystalline compound forms when trimethyltin hydroxide and methyliodide are put together in an ethereal solution. Recently this subject was undertaken by Kraus and Bullard[2] by measuring the conductivity of the mixture of trimethyltin hydroxide and methyliodide in acetone solution. They assumed the increase of conductivity of the mixtures due to the formation of a salt having the formula, $((CH_3)_3SnOH)_2CH_3I$. This has lead my attention to further investigation of this reaction. The experimental results show that the crystalline compound is identical with the compound which was obtained by the reaction between trimethyltin hydroxide and trimethyltin iodide[3]. Therefore, the reaction may be formulated as follows:

$$(CH_3)_3SnOH + CH_3X \rightarrow (CH_3)_3SnX + CH_3OH$$
$$2(CH_3)_3SnOH + (CH_3)_3SnX \rightarrow ((CH_3)_3Sn)_3O\cdot X\cdot H_2O$$

Experimental.

Two molecular proportion of trimethyltin hydroxide and one molecular proportion of methyliodide in a large amount of ethyl ether were introduced into a round bottom flask and connected with reflux condenser and heated on a water bath for about three hours. The solution of the mixture was filtered through filter paper while it was hot. The clear solution was kept over night in open air. From this solution a beautiful prismatic compound crystallized out.

On analysis it appeared to be identical to the compound formed between trimethyltin hydroxide and trimethyltin iodide in benzene solution.

Anal: Subs. = 0.2144, 0.1998; AgI = 0.0771, 0.0718 gr. Found: I = 19.44, 19.43%. Calcd. for $C_9H_{29}O_2Sn_3I$: I = 19.46%.

Subs. = 0.3511; SnO_2 = 0.2442 gr. Found (Carius): Sn = 54.77%. Calcd. for $C_9H_{29}O_2Sn_3I$: Sn = 54.59%.

(1) T. Harada, Thesis, Clark University, Worcester, Mass., 1923.
(2) Kraus and Bullard, *J. Am. Chem. Soc.*, **52** (1930), 4057.
(3) Kraus and Harada, ibid., **47** (1925), 2416; Harada, this Bulletin, **2** (1927), 105.

The Conductance of the Compound: No special precautions were taken, since the purpose of measuring the conductance of the compound was to get a general idea of the composition of the compound. The specific conductances of 0.1 N and 0.0166 N solutions of the compound in water were found to be 7.43×10^{-4} and 1.51×10^{-4} respectively and 1.41×10^{-4} and 0.35×10^{-4} in ethyl alcohol respectively expressed as reciprocal ohms at 23°C.

The magnitude of the specific conductance in water is about five times larger than that in alcohol. In other words, the extension of the dissociation of the compound in alcohol is about one fifth lower than it is in water. The equivalent conductances of the compound in alcohol at the concentrations, therefore, are 14.1 and 21.0 respectively. The specific conductance decreases as dilution increases. However, the equivalent conductance increases with increasing dilution. Therefore, the compound appears to be a salt.

Summary.

The reaction between trimethyltin hydroxide and methyliodide was studied. The compound formed from the mixture was identical to the compound formed from trimethyltin hydroxide and trimethyltin iodide having the formula $((CH_3)_3Sn)_3OX$, H_2O.

The conductance of the compound was studied. The results indicate that the compound appears to be a salt.

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