

STUDIES ON MERCAPTALS OF SUGARS. II. NORMAL
PROPYL MERCAPTALS OF SUGARS.

By Yūichi MAEDA and Yoshisuke UYEDA.

Received July 5, 1926. Published August 28, 1926.

Normal butyl mercaptals of sugars have been studied by one of the authors (Uyeda) and Kamon, and are described in the previous paper. Now, the authors have tried to study on the normal propyl mercaptals of sugars, according to Fisher's method. The outline of the results is reported in this paper.

Experimental. Mercaptals are prepared by the following method: Each sugar is dissolved in equal quantity of concentrated hydrochloric acid (sp. gr. 1.20), to whose solution, a little excess of molecular proportion of normal propyl mercaptan being added, well shaken and stand over night. Most of them begin to crystallize out within an hour. The crystalline product is filtered, washed with water, and dried on the porous tile. The crude products thus obtained are purified by the recrystallization from dilute alcohol, the mercaptals are nice white crystalline needles.

The physical constants and the results of analysis are summarized in the following tables:

TABLE 1. Properties of Mercaptals.

	M.p.	Sp. rotation $[\alpha]_D^{17}$
Glucose N-propyl mercaptal	147°	+41°
Galactose ,,	129	+27.5
Mannose ,,	125	+31
Rhamnose ,,	130	+10
Arabinose ,,	128	+29
Maltose ,,	146	+25
Sucrose ,,	146	+13.5

TABLE 2. Analysis of Mercaptals.

		Sulphur	
		Calc. %	Found %
Glucose N-propyl mercaptal	$C_6H_{12}O_5(C_3H_7S)_2$	20.38	20.07
Galactose ,,	$C_6H_{12}O_5(C_3H_7S)_2$	20.38	20.15
Mannose ,,	$C_6H_{12}O_5(C_3H_7S)_2$	20.38	20.01
Rhamnose ,,	$CH_3C_5H_9O_4(C_3H_7S)_2$	21.47	21.24
Arabinose ,,	$C_5H_{10}O_4(C_3H_7S)_2$	22.53	22.20
Maltose ,,	$C_{12}H_{22}O_9(C_3H_7S)_4$	20.98	20.61
Sucrose ,,	$C_{12}H_{22}O_9(C_3H_7S)_4$	20.98	20.68

The sulphur was determined by using sodium peroxide in Parr bomb.

Other sugars than these, namely xylose, fructose and lactose, were tried, but ended in negative results.

Summary.

The following sugars were obtained as new crystalline mercaptals by treatments with normal propyl mercaptan :—

Three hexoses, glucose, galactose and mannose ; one pentose, arabinose, one methyl pentose, rhamnose ; two dioses, maltose and sucrose.

Our sincere thanks are due to Assistant Professor Ishinada, who kindly checked carefully the physical constants of our samples.

Organic Chemical Laboratory,
Kanazawa Higher Technical School.
