occurred as doublets with the large coupling constants (8 Hz), a fact which indicated it to be a β-anomer. The rotation contribution of the glucose component in pteroside B ($[M]_D$ of pteroside B$-[M]_D$ of the aglycone (III)$=-107$) showed that the glucose involved is of the D series.[3]

On the basis of the above evidence, pteroside B is concluded to be 2(*R*), 5,7-trimethyl-4-(2′-hydroxyethyl)-indan-1-one 2′-β-D-glucopyranoside (I).

Acknowledgement We are greatly indebted to Dr. K. Kuriyama, Research Laboratory, Shionogi & Co., Ltd., for the CD data and discussion.

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Received April 1, 1970

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[Chem. Pharm. Bull. 18(7)1489—1491(1970)]

UDC 547.212.04 : 547.213.04

C-13 Resonance Chemical Shift for Substituted Ethyl and Isopropyl Derivatives

Recently, the C-13 resonance chemical shifts for organic compounds have become of interest from the physical, chemical, and biological view point.[1] Numerous C-13 chemical shifts for liquid ethyl and isopropyl derivatives are presented in Tables I and II.

TABLE I. C-13 Chemical Shifts for C_2H_5R Derivatives Ref. CS_2 (ppm)

R	α-C	β-C	
NEt_2	145.8	180.5	
NHEt	148.9	177.6	
OH	135.5	175.1	
OEt	127.4	178.3	
OCOMe	133.1	179.1	173.0 ($OCO^{13}Me$)
Ph	163.8	177.3	
Cl	153.2	174.0	
Br	165.1	173.1	
CO_2H	165.6	184.6	
CO_2Me	166.1	184.4	142.3 ($CO_2{}^{13}Me$)
CHO	156.0	187.1	
COMe	156.8	185.7	164.4 ($CO^{13}Me$)
COEt	158.0	185.6	
CN	71.2	182.4	
NO_2	122.4	181.6	
H[a)]	188.0	188.0	
Me[b)]	177.8	178.3	

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Table II. C-13 Chemical Shifts for Me_2CHR Derivatives Ref. CS_2 (ppm)

R	α-C	β-C	
OH	129.4	167.7	
OCOMe	125.3	170.8	171.6 ($OCO^{13}Me$)
Et	161.4	171.4	163.3 (CH_2)
			181.9 (CH_3)
Cl	133.1	165.7	
Br	148.2	164.1	
CO_2Me	159.3	174.4	142.2 ($CO_2{}^{13}Me$)
CO_2H	159.1	174.7	
CN	173.2	173.2	69.3 (CN)
COMe	151.9	175.3	166.3 ($CO^{13}Me$)
NO_2	114.2	173.0	
H[a]	177.8	178.3	
Me[b]	169.1	169.1	

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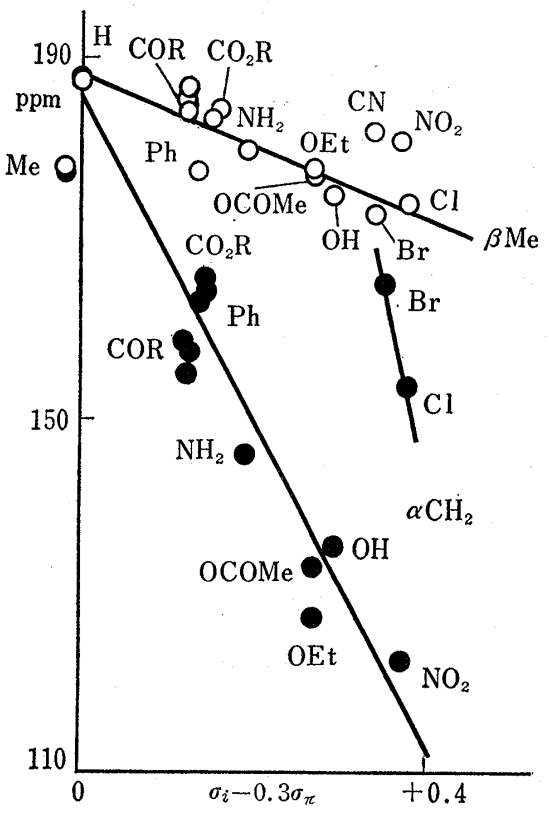

Fig. 1. C-13 Chemical Shifts for Substituted Ethyl Derivatives

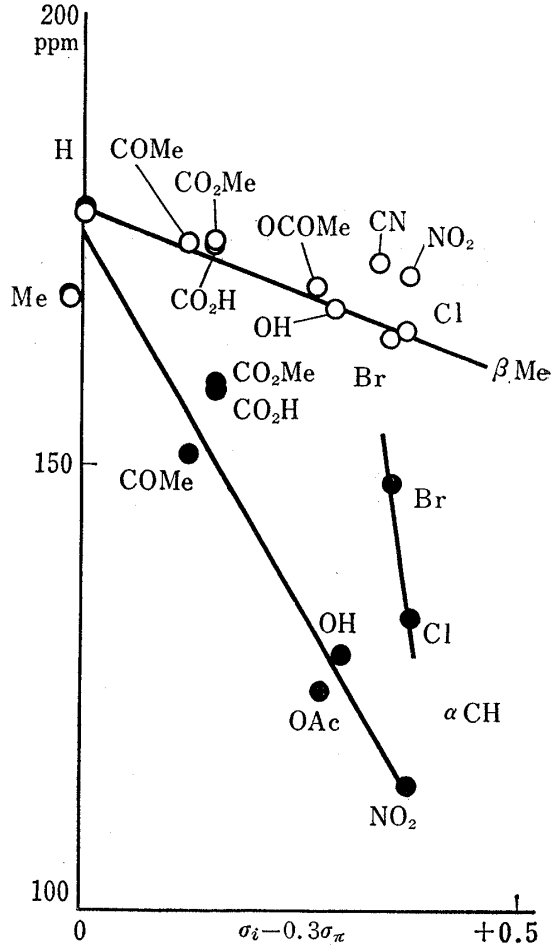

Fig. 2. C-13 Chemical Shifts for Substituted Isopropyl Derivatives

They were all determined by the normal and proton decoupling technique using Hitachi Perkin–Elmer Model R-20A spectrometer equipped with 15.085 MHz transmitter. These

shifts are arranged by the linear combination of the substituent constants σ_i and σ_π,[2] and linear relations among both α- and β-C-13 chemical shifts with respect to σ_i—0.3 σ_π are observed as shown in Fig. 1 and 2.

Our previous study[3] confirmed that the α-H-1 chemical shifts for substituted methyl and ethyl derivatives are linear with σ_i—0.25 σ_π, whereas those in the β- position, separated from the substituent group by three σ bonds, for ethyl and isopropyl derivatives are linear with σ_i, and from this fact it has been expected that the π-electronic effect, in other words, the delocalization effect, is effective through two σ bonds.

In the present, the same conclusion was verified for the β-C-13 resonance chemical shifts for substituted ethyl and isopropyl derivatives. Details of this work will be published in due time.

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[Chem. Pharm. Bull. 18(7)1491—1493(1970)]

UDC 547.854.83.07 : 547.918.07

Synthesis of 2-Thiouridine and 6-Methyl-3-(β-D-ribofuranosyl)-2-thiouracil

Recently several 2-thiopyrimidine nucleosides have been identified as the minor constituent of transfer ribonucleic acids (t-RNAs). 5-Methylaminomethyl-2-thiouridine and 2-thiocytidine were found in t-RNA of *E. coli*[1] and 5-methoxycabonylmethyl-2-thiouridine was in t-RNA of baker's yeast.[2] 2-Thiocytidine has been prepared by the extended Hilbert–Johnson procedure from 4-amino-2-methylthiopyrimidine and a ribosyl chloride *via* the ribosyl pyrimidinium intermediate[3] and by the mercuri–procedure starting from diacetyl-2-thiocytosine.[4] Mercuric cyanide procedure[5] has recently been applied.[6] 2-Thiouridine, which had been prepared by the transformation of uridine through anhydronucleoside,[7] has been reported to be prepared by the mercuri–procedure starting from acetylated 2-thiouracil.[4] More recently, the silyl–procedure has been reported to be effective for 2-thiouridine synthesis.[8] These recent developments to the synthesis of 2-thiopyrimidine nucleosides prompted us to

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