Table 2

| Substance | No. rats per group | Wt. of substance giving same response as standard | | M.W. | No. moles cpd. equivalent to 1 mole DOCA | Mean |
|---|---|---|---|---|---|---|
| | | Subst. (mgm.) | Standard (DOCA) (mgm.) | | | |
| (I) | 5 | 3 | 0·33 | 176 | 17 | 16 |
| | 5 | 3 | 0·375 | | 10 | |
| | 5 | 3 | 0·33 | | 17 | |
| | 8–10 | 1 | 0·087 | | 21 | |
| (II) *cis* configuration? | 5 | 3 | 0·6 | 182 | 8·2 | 10·7 |
| | 6 | 2·5 | 0·5 | | 3·9 | |
| | 6 | 2 | 0·5 | | 7·2 | |
| | 4 | 5 | 0·418 | | 21·7 | |
| (III) $R = H$ | | 1·25 | 0·25 | 252 | 6·6 | |
| (III) $R = OCH_3$ | | 1·25 | 0·5 | 282 | 2·9 | |
| (IV) | | 1·25 | 0·5 | 282 | 2·9 | |

The error is of the order 100 ± 80 ($P = 0·95$).

Simpson (salt balance) of the Courtauld Institute of Biochemistry.

Full details of the chemistry and pharmacology will be published elsewhere.

We wish to acknowledge our indebtedness to the Medical Research Council for a grant, and one of us (D. W. M.) is indebted to the University of London for the award of an I.C.I. Fellowship.

W. H. Linnell
D. W. Mathieson
G. Williams

School of Pharmacy,
University of London,
17 Bloomsbury Square,
London, W.C.1.
Nov. 24.

[1] Steiger and Reichstein, *Helv. Chim. Acta*, **20**, 1164 (1937).
[2] Selye and Schenker, *Proc. Soc. Exp. Biol., N.Y.*, **39**, 518 (1938).

## Structure of Adenylthiomethylpentose

It has been shown in a previous communication[1] that the structure of adenylthiomethylpentose is 9′-(5-thiomethyl-ribofuranosyl)-adenine, based on periodate titration of adenylthiomethylpentose, thiosugar and thiopentitol, and from the result of the Boeseken test upon adenylthiomethylpentose. We have now obtained further evidence for this structural formula using synthetic methods.

Adenylthiomethylpentose gave a tritosyl derivative (m.p. 158–160°. Found: N, 9·27; calc. for $C_{32}H_{33}O_9N_5S_4$: N, 9·21 per cent) on treatment with *p*-tosyl chloride in dry pyridine. Since none of its tosyl residue was replaced by iodine on treatment with sodium iodide in acetone during 2 hr. at 100°, it follows that there is no tosyl group at position 5 of the sugar portion.

Condensation of adenylthiomethylpentose with acetone in the presence of zinc chloride gave mono-*iso*propylidene adenylthiomethylpentose (m.p. 143°. Found: N, 19·9; calc. for $C_{14}H_{19}O_3N_5S$: N, 20·7 per cent. Picrate, m.p. 175°. Found: N, 19·76, S, 5·8; calc. for $C_{14}H_{19}O_3N_5S.C_6H_3N_3O_7$: N, 19·78, S, 5·66 per cent), from which the *iso*propylidene group was hydrolysed by dilute acid to give adenylthiomethylpentose again, though the yield was very poor.

On the other hand, monoacetone adenosine, obtained by condensing with acetone in the presence of zinc chloride by the method of Levene and Tipson[2], was converted to 5-tosylmonoacetone adenosine (found: N, 15·52; calc. for $C_{20}H_{23}O_6N_5S$: N, 15·18 per cent) by treating with *p*-tosyl chloride in dry pyridine at room temperature for 24 hr. Dry tosyl monoacetone adenosine and dry sodium methyl mercaptan was dissolved in acetone and the solution heated in a sealed tube at 100° for 2 hr. The reaction product (5-thiomethylmonoacetoneadenosine) after conversion into the picrate, which had a melting point of 172–174° (decomp.) (found: N, 19·3, S, 5·3; calc. for $C_{14}H_{19}O_3N_5S.C_6H_3N_3O_7$: N, 19·7, S, 5·6 per cent), was compared with the monoacetone derivative of the natural compound, and no melting-point depression occurred when admixed with the picrate of monoacetone adenylthiomethylpentose.

Also, from 5-tosyl-2,3-*iso*propylidene inosine[3] (m.p. 185°) 5-thiomethyl-2,3-*iso*propylidene inosine was obtained by heating with sodium methyl mercaptan in acetone. The crude reaction product was converted into picrate (m.p. 102° (decomp.); found: N, 16·4; calc. for $C_{14}H_{18}O_4N_4S.C_6H_3N_3O_7$: N, 17·2 per cent).

Treating adenylthiomethylpentose with nitrous acid gave hypoxanthinylthiomethylpentose (m.p. 221°) as described by Kuhn and Henkel[4], which yielded a monoacetone derivative (m.p. 85° (decomp.)) on condensing with acetone in the presence of zinc chloride. The picrate of the latter had a melting point of 105° (decomp.) (found: N, 16·75; calc. for $C_{14}H_{18}O_4N_4S.C_6H_3N_3O_7$: N, 17·2 per cent), and showed no melting-point depression when admixed with the picrate of the monoacetone-derivative of 5-thiomethyl-inosine.

This work was aided by a grant from the Scientific Research Fund of the Ministry of Education of Japan.

Kiyoo Satoh
Katashi Makino

Department of Biological Chemistry,
School of Medicine,
University of Kumamoto,
Kumamoto.

[1] Satoh and Makino, *Nature*, **165**, 769 (1950).
[2] Levene and Tipson, *J. Biol. Chem.*, **121**, 131 (1937).
[3] Levene and Tipson, *J. Biol. Chem.*, **111**, 313 (1935).
[4] Kuhn and Henkel, *Chem. Abst.*, **36**, 6241 (1942).

## An Isomeric Benzylideneguanosine

Although various investigators[1] have prepared benzylideneguanosine, Michelson and Todd are the only ones who report a specific rotation as well as a melting point for this compound. Recently it became desirable to prepare benzylideneguanosine in this laboratory. Using the same general method described previously[1], we have obtained a benzylideneguanosine with a melting point in agreement with those already reported, but with a specific rotation which is quite different. On the other hand, benzylideneadenosine has also been prepared and has been found to be identical in physical properties with the substance described by Michelson and Todd[1].

Anhydrous guanosine from yeast nucleic acid (m.p. 235° C. decomp. (all melting points are uncorrected); $[\alpha]_D^{26}$ − 60·2° in 0·1 *N* sodium hydroxide*, *c* 3·05; $[\alpha]_D^{21}$ − 34·1° in dimethylformamide, *c* 0·122) was used as the starting material in the preparation of the benzylidene derivative.

* This specific rotation is for guanosine containing two molecules of water of crystallization; all other specific rotations given in this communication are calculated on an anhydrous basis.