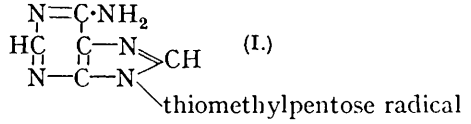
400. *The Constitution of the Purine Nucleosides. Part V. Adenine Thiomethylpentoside.*

By Roderick Falconer and J. Masson Gulland.

In Part IV (J., 1936, 765) it was shown that in adenosine and the related nucleotides the pentose molecule is attached to position 9 of the adenine molecule. This conclusion was based on the resemblance of the ultra-violet absorption spectra of adenosine, the adenine nucleotides and inosine on the one hand, and those of 9-methyladenine and 9-methylhypoxanthine on the other, and on their mutual dissimilarity to the spectra of 7-methyladenine and 7-methylhypoxanthine.

The method has now been extended to the examination of adenine thiomethylpentoside, which was isolated from yeast, from oryzanin and from impure cozymase (Mandel and Dunham, *J. Biol. Chem.*, 1912, **11**, 85; Suzuki, *J. Chem. Soc. Tokyo*, 1914, **34**, 1134; Levene, *J. Biol. Chem.*, 1924, **59**, 465; Suzuki, Odake, and Mori, *Biochem. Z.*, 1924, **154**, 278; v. Euler and Myrbäck, *Z. physiol. Chem.*, 1928, **177**, 237), and yielded adenine and thiomethylpentose when hydrolysed (Suzuki *et al.*, *loc. cit.*; Levene and Sobotka, *J. Biol. Chem.*, 1925, **65**, 551).



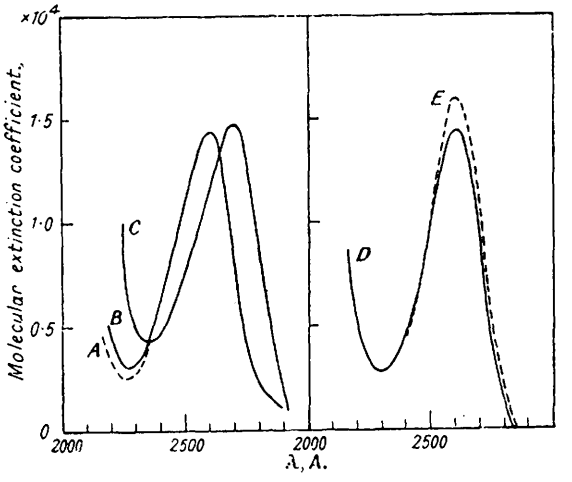
(I.)

(The constitution of thiomethylpentose has not yet been determined.)

The ultra-violet absorption spectra of adenine thiomethylpentoside in aqueous, acid and alkaline solutions (Fig. 2; peak at 2600A.; compare Heyroth and Loofbourow, *J. Amer. Chem. Soc.*, 1934, **56**, 1728) closely resemble those of adenosine and 9-methyladenine in similar conditions and are unlike those of 7-methyladenine (Fig. 1, taken from Part IV). It follows, therefore, that in adenine thiomethylpentoside (I) the thio-sugar is attached to position 9.

We are greatly indebted to Professor U. Suzuki, President of the Continental Institute for Scientific Research, Hsingking, Manchukuo, for a gift of adenine thiomethylpentoside. Measurements were made with a Bellingham and Stanley quartz spectrograph No. 2 and photometer, the light source being a condensed spark between tungsten–steel electrodes. The

FIG. 1. FIG. 2.



A. *Adenosine in water,* N/20-HCl, *and* N/20-NaOH.
B. 9-*Methyladenine in water,* N/20-HCl, *and* N/20-NaOH.
C. 7-*Methyladenine in water and* N/20-HCl.
D. *Adenine thiomethylpentoside in water,* N/20-HCl, *and* N/20-NaOH.
E. *Adenine thiomethylpentoside in* N/20-NaOH *at* 1·5 *hours after preparation of the solution.*

solutions, prepared from dried material and made to a strength of M/100,000, were examined immediately in a layer thickness of 4 cm. against controls. The peaks of the spectra of adenine thiomethylpentoside all lay at 2600A.

It was observed that the extinction coefficient of adenine thiomethylpentoside in alkaline solution had increased when a short time had elapsed after its preparation, the wave-length of the peak, however, remaining unchanged (Fig. 2).

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