

A SYNTHESIS OF dl-METHYLMYCAMINOSIDE

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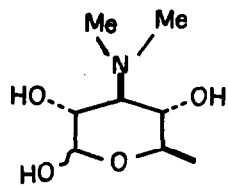
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(Received in Japan 3 September 1969; received in U.K. for publication 22 September 1969)

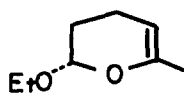
Mycaminose 1, the common component of magnamycin,<sup>1)</sup> spiramycin<sup>1b),2)</sup> and leucomycin,<sup>3)</sup> has been derived from natural sugars by A. C. Richardson<sup>4)</sup> and A. B. Foster et al.<sup>5)</sup> as methylglycoside. In this communication we should like to report a simple total synthesis of dl-methylmycaminoside.

Hydroborated compound 3<sup>6)</sup> from 2-ethoxy-6-methyl-3,4-dihydro-2H-pyran 2 was oxidized with H<sub>2</sub>O<sub>2</sub> in alkaline solution to give an alcohol 4<sup>6)</sup> in 86 % yield from 2. Reaction of the alcohol 4 with bromine in boiling methanol containing hydrogen chloride for 2 days yielded three bromo compounds, 5<sup>7)</sup> m.p. 92 - 92.5° (  $\nu_{\text{max}}^{\text{nujol}}$  3280 cm<sup>-1</sup>,  $\tau^{\text{CDCl}_3}$  8.65 (3H, d, J = 6Hz), 6.45 (3H, s), 5.65 (1H, d, J = 9Hz)), 6, m.p. 44 - 45° (  $\nu_{\text{max}}^{\text{nujol}}$  3340 cm<sup>-1</sup>,  $\tau^{\text{CDCl}_3}$  8.74 (3H, d, J = 6Hz), 6.55 (3H, s), 5.37 (1H, d, J = 3Hz)) and 7, m.p. 76 - 77° (  $\nu_{\text{max}}^{\text{nujol}}$  3240 cm<sup>-1</sup>,  $\tau^{\text{CDCl}_3}$  8.7 (3H, d, J = 6Hz), 6.63 (3H, s), 5.31 (1H, d, J = 1Hz)) in 14, 11 and 47 % yield, respectively. The doublet at  $\tau$  5.65 with J = 9Hz in 5 pointed to the diequatorial disposition of Br and OCH<sub>3</sub> in this compound. Since the anomerization of 5 in methanol saturated with hydrogen chloride afforded an equilibrated mixture of 5 and 6 in a ratio of about 1 : 1, the compound 6 is the anomer.

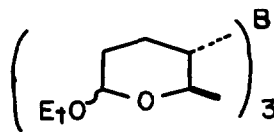
Treatment of 6 with NaN<sub>3</sub> in DMSO at 140° for 24 hours gave unsaturated alcohol 8 in 61 % yield. On the other hand, the compound 7, which indicates a doublet at  $\tau$  5.31 with J = 1Hz in nmr spectrum possesses diaxial Br and OCH<sub>3</sub>, and as expected, readily affords the unsaturated alcohol 8 by treating with NaN<sub>3</sub> in DMF at 120 - 125° for 17 hours, in 71 % yield. Thus the three bromo compounds are convertible to 8.



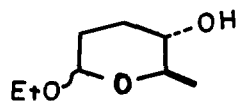
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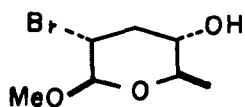
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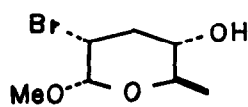
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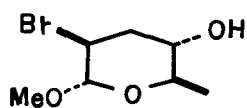
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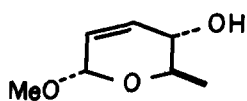
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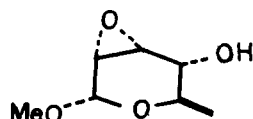
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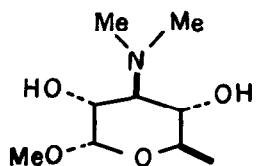
7



8



9



10

On oxidation with perbenzoic acid in dry benzene at room temperature for 7 days, 8 gave an epoxide 9, m.p. 84 - 84.5° ( $\nu_{\text{max}}^{\text{nujol}}$  3400, 900  $\text{cm}^{-1}$ ,  $\tau^{\text{CDCl}_3}$  8.72 (3H, d, J = 6Hz), 6.56 (3H, s), 5.15 (1H, d, J = 3Hz)) in 90 % yield. Subsequent treatment of 9 with saturated aqueous solution of dimethylamine at 80° for 9 hours gave dl-methylmycaminoside 10, m.p. 112 -113.5° ( $\nu_{\text{max}}^{\text{nujol}}$  3540, 3400  $\text{cm}^{-1}$ ,  $\tau^{\text{CDCl}_3}$  8.72 (3H, d, J = 6Hz), 7.5 (6H, s), 7.41 (1H, t, J = 9Hz), 7.01 (1H, t, J = 9Hz), 6.6 (3H, s), 6.25 (1H, q, J = 9 + 4Hz), 5.35 (1H, d, J = 4Hz)) in 75 % yield.<sup>8)</sup> The compound 10 was completely identical with the optical active 10,<sup>9)</sup> derived from leucomycin, in nmr spectrum.

Acknowledgment The authors are grateful to Dr. Ogura for sending us nmr spectral datum of optical active 10.

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