

METHYL-STREPTOMYCIN

A NEW HYDROGENATION PRODUCT OF STREPTOMYCIN

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Streptomycin contains the branched carbohydrate 5-deoxy-3-C-formyl-lyxose (1).

Hydrogenation of streptomycin in aqueous solution with hydrogen on a palladium - on - carbon catalyst yields dihydrostreptomycin (2) which can easily be crystallised as a salt with a mineral acid.

Electrolytic reduction, or reduction with aluminium amalgam yields dihydrodesoxy streptomycin (3).

Treatment of streptomycin with ethylmercaptan and the traditional catalysts, dry hydrogen chloride, anhydrous zinc chloride og anhydrous calcium chloride yields ethyl-thiostreptobios-aminide mercaptal (4) or the streptomycin does not react. It has been found that molecular sieve, BDH.4A XW catalyses the formation of streptomycin-di-(ethyl-thio) acetal in the presence of zinc chloride. Streptomycin-tergitate (84,5 g) was dissolved/suspended in 250 ml of ethyl-mercaptan and added 40 g of the molecular sieve and 6 g of  $ZnCl_2$ . After 24 h the excess of mercaptan was evaporated and the thioacetal was dissolved in methanol. The streptomycin-di-(ethyl-thio) acetal sulfate (27 g) was precipitated by addition of triethylamine sulfate.

Desulfuration of the streptomycin-di-(ethyl-thio) acetal (25 g) with freshly prepared Raney Nickel (10 g) in boiling 50 percent ethanol (200 ml) gave methyl-streptomycin. After filtration the new streptomycin-derivative was precipitated as the crystalline sulfate by addition of further ethanol. Yield after recrystallisation 5 g. Calculated for  $C_{42} H_{90} N_{14} O_{34} S_3 \cdot 6H_2O$ .

C:35,4 H:6,56 N:12,94 found C:35,1 H:6,35 N:12,72

Fig. 1.

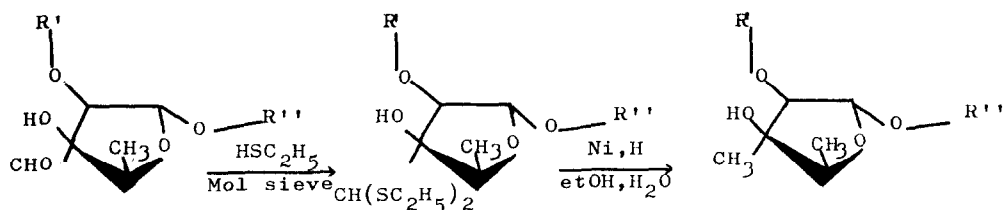


Table I.

NMR data in p.p.m. for dihydrostreptomycin sulfate (I), streptomycin-di-(ethyl-thio) acetal sulfate (II) and methylstreptomycin sulfate (III). Solvent D<sub>2</sub>O. Internal standard: TMS. Instrument Varian A-60.

Group	I	II	III
CHCH <sub>3</sub>	1,19 (d)	1,19 (d)	1,19 (d)
SCH <sub>2</sub> CH <sub>3</sub>	-	1,24 (t)	-
C-CH <sub>3</sub>	-	-	1,35 (s)
N-CH <sub>3</sub>	2,78 (s)	2,78 (s)	2,87 (s)
SCH <sub>2</sub> CH <sub>3</sub>	-	2,80 (q)	-
acetal H <sub>1</sub>	5,28 (s)	5,28 (s)	5,24 (s)
acetal H <sub>2</sub>	5,50 (s)	5,53 (s)	5,53 (s)

#### References

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