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3-AMINO-PROLINE FROM VIOMYCIDINE

Carlo Gallina, Virginio Koch and Aurelio Romeo
Istituto di Chimica Farmaceutica dell'Università di Roma
Italia

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Viomycidine is one of the compounds formed on acid hydrolysis of viomycin (1) and efforts to elucidate its structural formula (2) have only recently met with success (3).

In this note we report some results obtained concerning viomycidine. It has been observed (2a, 2b) that this compound absorbs hydrogen in the presence of catalysts, but the nature of the reaction has not been explained, since the products have not been isolated. We were led to an investigation of this problem, based on the behaviour of derivatives of 5-amino-proline(*) in hydrogenation reactions.

Viomycidine was subjected to catalytic hydrogenation in acetic acid (palladium on charcoal, 60°C, 10 atmospheres) and formed two main products, as shown by silica gel thin layer chromatography. One of these compounds was isolated in 50% yield as the hydrochloride and analytical data indicated the molecular formula $C_6H_{12}N_4O_2 \cdot HCl$(**) crystallised from water-ethanol, m.p. 245°C, $[\alpha]_D$ + 36,5° (c=1,8; H_2O). This compound gave a strongly positive Sakaguchi test and reacted completely when hydrolysed with barium hydroxide, as shown by silica gel thin layer chromatography which indicated the presence of two main compounds. From the reaction mixture it was possible to isolate

(*) N,N'-dicarbobenzyloxy-5-amino-proline, recently prepared in this laboratory is converted to proline on hydrogenation with palladium on charcoal catalyst.

(**) Elemental analyses of the reported compounds were in agreement with calculated values. Melting points were determined with a Tottoli apparatus.

one of them as the hydrochloride; $C_5H_{10}N_2O_2 \cdot HCl$ [crystallised from water-ethanol, m.p. 228°C, $[\alpha]_D$ = -6 (c=1,8; H_2O)]. This compound gave IR and NMR spectra identical to those of a racemic 3-amino-proline(*) prepared in this laboratory.

We have therefore assigned the formula 3-guanido-proline to the compound prepared by catalytic hydrogenation of viomycidine. On the basis of the structure of viomycidine, cis geometry should be assigned to the 3-guanido-proline.

$$\text{Viomycidine} \xrightarrow{Pd/C,H_2} \text{3-guanido-proline} \xrightarrow{Ba(OH)_2} \text{3-amino-proline}$$

The 3-amino-proline obtained from viomycidine displayed and ORD curve similar to those of D-proline and D-4-hydroxy-proline (4). We do not think that this finding can be related to the corresponding centre of asymmetry in viomycidine, since the relative stabilities of cis and trans forms of 3-amino-proline in alkaline media have not yet been investigated.

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(*) The synthesis was carried out using methyl N-acetyl- Δ^2-pyrroline-2-carboxylate as starting material.