Recently, Tsuda *et al.*[3] characterized all four 14,15-dihydroxyl isomers derived from progesterone (III) and concluded that the structure of the isomer obtained by hydrolysis of the 14α,15α-epoxide of progesterone (IV), which was found to be identical through infrared spectra with the present specimen, should be 14β,15α-dihydroxyprogesterone (II). Configuration of the hydroxyl group at 3 of purpnigenin (I) is most likely to be β-oriented in view of other natural Δ^5-3-hydroxy steroids.

On the basis of these considerations it would be most appropriate to assign the structure of 3β,14,15α-trihydroxy-14β-pregn-5-en-20-one (I) to purpnigenin which has 14β-hydroxyl group, i.e. C/D-ring *cis*-fused, similar to cardiac aglycones[4] and diginigenin-type steroids.[5]

The author expresses his deep gratitude to Prof. K. Tsuda of The Institute of Applied Micorbiology, University of Tokyo, for his helpful advice.

Research Laboratory,
Shionogi & Co., Ltd.,
Imafuku, Amagasaki, Hyogo-ken.

Hiroshi Ishii (石井 宏)

April 14, 1961.

3) K. Tsuda : Personal communication.
4) L. F. Fieser, M. Fieser : "Steroids," 728 (1959). Reinhold Publishing Corp., New York.
5) R. Tschesche, G. Buschauer : Ann., **603**, 59 (1957).

UDC 547.466.2.02

Assignment of the Absolute Configuration of Optically Active α-Amino Acid by Rotatory Dispersion Curves

Many problems on absolute configuration and stereochemistry have been solved by measurement of their anomalous rotatory dispersion curves.[1] Most of the optically active α-amino acids exhibit only plain dispersion curves over the presently accessible spectral ranges and it is impossible to utilize these plain curves for the determination of their absolute configuration. Recently, Djerassi, *et al.*[2] found that N-dithiocarbalkoxy-α-amino acids of L-series exhibit positive Cotton-effect curves.

Various optically active α-amino acids, especially these not found in nature, have been synthesized in this laboratory. For determining the absolute configuration of these amino acids, attempts have also been made to search for easily prepared α-amino acid derivatives, which show anomalous rotatory dispersion curves. Thus it was found that phthaloyl derivatives (I) of α-amino acids are most suitable for this purpose, because they can easily be prepared in a good yield by Nefkens' mild phthaloylation, and racemization does not occur in the course of this synthesis.[3] As shown in Fig. 1, phthaloyl derivatives of L- and D-α-amino acids exhibit anomalous rotatory dispersion curves. The resulting Cotton-effect curves can apparently be used for absolute configurational assignments of the α-asymmetric center, all members of L-series (L-methionine, L-alanine, L-aspartic acid, L-glutamic acid, and L-phenylalanine), which have so far been examined, show a similar

1) C. Djerassi "Optical Rotatory Dispersion," (1960) McGraw-Hill Book Co., New York.
2) C. Djerassi, B. Sjöberg, A. Fredga : J. Am. Chem. Soc., **81**, 5002 (1959).
3) G. H. L. Nefkens, G. I. Tesser, R. J. F. Nivard : Rec. trav. chim., **79**, 688 (1960).

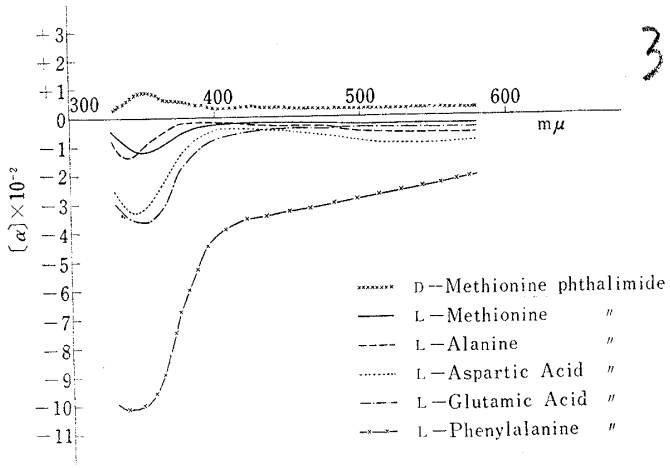
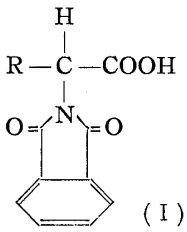
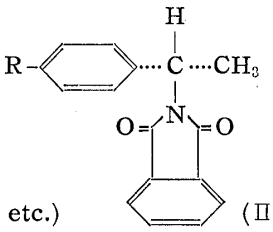


Fig. 1. Optical Rotatory Dispersion Curves (in MeOH)*

* An error of up ±0.2 should be recognized as $[\alpha]\times10^{-2}$ because the measurement was made at c=0.05.



(I) (R=H, NH_2, NO_2, etc.)



(II)

negative Cotton-effect curve, and those of D-series (D-methionine) exhibit a positive Cotton-effect curve which is completely antipodal to L-series. Phthaloyl derivatives (II) of (−)-(S)-α-phenylethylamines show negative Cotton-effect curves[4] which are substantially the same as those of phthaloyl-L-amino acids, but those of the latter seem to occur in a lower wave-length region than that of the former, though the solvent used is different between them. Contrary to the fact that N-dithiocarbalkoxy-α-amino acids of L-series show a positive Cotton-effect, phthaloyl derivatives of the same series show a negative Cotton-effect curve. This cannot be explained exactly, but this phenomenon may be explainable by the distance rule.[5]

Details of this method and its application to α-amino acids not found in nature will be reported in the near future.

The writers express their deep gratitude to Prof. Y. Hirata and Mr. Yamamura of the Nagoya University for the favor of measuring the rotatory dispersion curves and to Dr. M. Suzuki of Tokyo Research Laboratory, Tanabe Seiyaku Co., for the kind advices.

Faculty of Pharmaceutical Sciences,
University of Tokyo,
Hongo, Tokyo.

Shun-ichi Yamada (山田俊一)
Kazuo Achiwa (阿知波一雄)

March 10, 1961.

4) J. H. Brewster, S. F. Osman : J. Am. Chem. Soc., **82**, 5754 (1960).
5) C. Djerassi, "Optical Rotatory Dispersion," 108 (1960). McGraw-Hill Book Co., New York.