

Control experiments have shown that none of the substances tested significantly inhibited *B. welchii* SR 12 glutamic acid decarboxylase.

It is thus seen that carbutamide and tolbutamide significantly inhibit alanine transaminase, whereas sulphacetamide and sulphadiazine do not, and it is suggested that, by inhibiting transamination, such compounds decrease the rate of neoglucogenesis and hence lower the blood sugar.

I should like to thank the Australian National Health and Medical Research Council and Messrs. Eli Lilly and Co. for their support.

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The α - β Transformation in Keratin

THE α - β transformation, as observed by X-rays, has always held a position of central importance in any considerations on the molecular structure of keratin. It is therefore surprising that no quantitative investigation of the intensity variation of different reflexions comprising the X-ray diagram has been reported in the literature. It is generally accepted that the X-ray diagram of keratin changes little up to about 20 per cent extension (α -pattern), undergoes a rapid change between 30 and 50 per cent extension, and remains essentially unchanged during further extension (β -pattern)^{1,2}. It is also claimed that the onset of the transformation always occurs at about 20 per cent extension irrespective of the medium in which the fibres are stretched¹, and that the general character of the transformation is unaffected by relaxation effects and a wide variety of chemical treatments².

This picture appears to require considerable modification in the light of work which is being carried out by these laboratories. A specially adapted 'Norelco' Geiger-counter diffractometer is being used to investigate the X-ray diagram of wool, in particular the α - β transformation. The specimen, which consists of a bundle of about a thousand Lincoln wool fibres, is held between the jaws of a stretching device inside a chamber at controlled temperature and humidity. With the existing equipment only three reflexions lend themselves to reliable observation: the meridional α -arc (a group of reflexions at about 5.1 A.), the equatorial β -spot at about 4.65 A., and the diffuse equatorial spot (which in porcupine quill tip is a group of reflexions) at about 9.8 A. common to both α - and β -patterns. The fine structure of the 5.1 A. and the 9.8 A. reflexions is not resolved by the present X-ray optical arrangement, which is designed for maximum diffracted intensity rather than optimum resolution.

Interesting results were obtained by observing the variation in peak intensity of these three reflexions with extension under different conditions of temperature and humidity of the fibre bundle. In general, the X-ray diagram of Lincoln wool starts changing at low extensions (5 per cent or less), contrary to previous reports; at 20 per cent extension the α - β transformation is generally well advanced, and there is frequently no evidence of a rapid change between 30 and 50 per cent extension. (Fig. 1 is a typical plot of peak intensity against per-

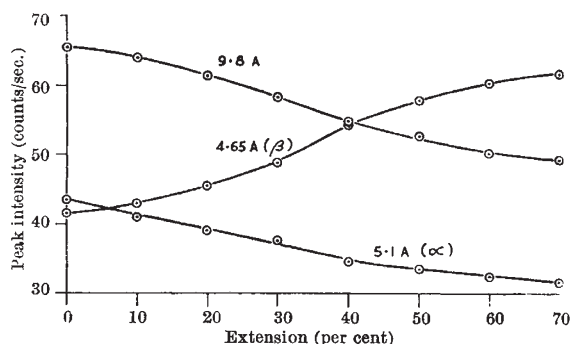


Fig. 1. Variation of peak intensity of the three prominent reflexions of the X-ray diagram of wool vs. percentage extension. In this particular test the X-ray diagrams were obtained at 20° C. and 0 per cent relative humidity; each increment of extension was carried out in water at 50° C.

centage extension for the three reflexions.) It was also found that if the specimen is stretched in air, the α - β transformation proceeds more quickly at 20° C. than at 50° C., and that low humidity accelerates the α - β transformation.

Under some experimental conditions (for example, stretching in air from 0 to 20 per cent extension at 20° C. and 60 per cent relative humidity), it was observed that a decrease in the 5.1 A. reflexion is not accompanied by a related increase in the 4.65 A. reflexion. A similar lack of correspondence was noted when a specimen, previously stretched in air at 20° C. and 100 per cent relative humidity from 0 to 40 per cent extension, was allowed to relax at that extension in water at 50° C. for 10 min. Comparison of the X-ray diagrams before and after stress relaxation revealed no significant change in the intensity of the 5.1 A. and 9.8 A. reflexions, and a marked increase in the intensity of the 4.65 A. reflexion. Observations of this type do not accord well with Astbury's hypothesis of a 'molecular' α - β transformation^{1,3}, as this hypothesis is based to a large extent, either explicitly or by implication, on a 1:1 correspondence of the intensity variation of the 5.1 A. and 4.65 A. reflexions.

The results quoted were obtained after correcting the experimental results for air-scattering, polarization, absorption and variation of diffracting material during extension. The last two corrections are fairly large and are now being tested.

A full account of this work is at present being prepared for publication.

I am indebted to Prof. C. J. Milner, head of the School of Applied Physics at the New South Wales University of Technology, for the use of the Norelco Geiger-counter diffractometer and many other facilities extended during this investigation.

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Nov. 27.

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