

2-acetamido 2-deoxy- α -D-altropyranoside (IV), $[M]_D +94^\circ$ (water), which rapidly consumed 1 mol. of periodate without the formation of formaldehyde or acidic products. (The low optical rotation and rapid periodate oxidation of IV suggest conformational instability⁴ of the glycoside.) Thus the acetamido group must be located at C₂ in IV and, assuming normal cleavage⁵ of the epoxide ring (that is, to give two axial substituents) in the reaction of I with methanolic ammonia, then II, III and IV must have the D-altrose configuration.

The absence of an O-acetyl group in II is surprising; further, Peat and Wiggins² reported methyl 2-acetamido 3-O-acetyl 4:6-O-benzylidene 2-deoxy- α -D-altropyranoside, melting point 184°, $[M]_D +179^\circ$ (CHCl₃), to be the major product (54.8 per cent) of the same reaction although full experimental details were not given. Re-investigation of the product isolated by these authors confirmed its identity, since it showed strong absorption at 1,729 cm.⁻¹ (O-acetyl) and 1,624 cm.⁻¹ (N-acetyl) in the infra-red, and on Zemplén deacetylation it was converted into II.

Total acidic hydrolysis of II gave crystalline 2-amino 1:6-anhydro 2-deoxy- β -D-altrose hydrochloride (V), which had an indefinite melting point, $[M]_D -315^\circ$ (water). (Found: C, 35.8; H, 6.0. C₆H₁₁O₄.N.HCl requires C, 36.4; H, 6.1 per cent.)

Substance V did not reduce Fehling's solution (although the hydrolysate from which it was isolated gave a positive reaction suggesting the presence of the free amino-sugar) and consumed 2 moles of periodate (cf. the results of Van Tamelen *et al.*⁵, obtained with 2-amino 1:6-anhydro-2-deoxy- β -D-gulopyranose). For comparison purposes it may be noted that 3-amino 1:6-anhydro 3-deoxy- β -D-altropyranose hydrochloride⁷ and 1:6-anhydro- β -D-altropyranose⁸ have $[M]_D$ values of -339° and -348° respectively. Paper chromatographic analysis, using the organic phase of a butanol/water/acetic acid (4:5:1) solvent system, of V and the hydrolysate from which it was isolated revealed a single component, with an R_F value similar to that of D-glucosamine, which reacted strongly with ninhydrin, aniline hydrogen phthalate⁹ (in the latter case) and ammoniacal silver nitrate¹⁰.

The ease of isolation of 2-amino-1:6-anhydro-2-deoxy- β -D-altropyranose hydrochloride recommends it as a suitable derivative for characterization of the parent amino-sugar, 2-amino-2-deoxy-D-altrose.

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² Peat and Wiggins, *J. Chem. Soc.*, 1810 (1938).

³ Robertson and Whitehead, *J. Chem. Soc.*, 319 (1940).

⁴ Mills, "Advances in Carbohydrate Chem.", 10, 1 (1955).

⁵ Overend and Vaughan, *Chem. and Indust.*, 995 (1955).

⁶ van Tamelen, Dyer, Carter, Pierce and Daniels, *J. Amer. Chem. Soc.*, 78, 4817 (1956).

⁷ Wiggins, *J. Chem. Soc.*, 18 (1947).

⁸ Richtmyer and Hudson, *J. Amer. Chem. Soc.*, 61, 214 (1939).

⁹ Partridge, *Nature* 164, 443 (1949).

¹⁰ Hough, *Nature*, 165, 400 (1950).

Metamict Tantalite from Western Australia

THIRTY-FOUR years ago, Bowley¹ recorded an analysis of a manganese-bearing tantalum-niobium oxide mineral that had been collected by Mr. R. C. Black at Yinnietharra, Western Australia. In his report, Bowley stated that Simpson was of the opinion that this mineral belonged to either the orthorhombic columbite-tantalite series or to the tapiolite-mossite group of tetragonal minerals, and with some element of doubt the mineral was tentatively identified as manganomossite.

Palache, Berman and Frondel² included this mineral in their treatment of the mineralogy of the tapiolite-mossite series, but clearly directed attention to the fact that the true status of the mineral is in doubt.

Type material, very kindly made available to me by Mr. J. C. Hood, director of the Government Chemical Laboratories, Perth, Western Australia, has now been studied. Autoradiographs of polished fragments exhibit weak but uniform radioactivity, and there are no indications of either inclusions, or zonal distribution of radioactive material as reported by Heinrich and Giardini³ for columbite from an unspecified locality in Canada.

X-ray diffraction patterns of single particles, 0.2 mm. in diameter, exhibit a few reflexions that are considerably streaked out along arcs, whereas the powder patterns exhibit about thirteen lines, all of which are exceedingly faint. If the mineral is heated in a silica tube *in vacuo* at 1,200°C. for 1 hr., the resultant material yields a fine X-ray diffraction pattern that is in conformity with that obtained from a member of the columbite-tantalite series; the strongest lines yielded by the heated material correspond in a general way with those found in films obtained when the unheated material is employed.

This evidence suggests that the Yinnietharra mineral is metamict tantalite and not a member of the tapiolite-mossite series; accordingly, this would appear to be the first record of a metamict member of the columbite-tantalite series.

A more detailed account of the mineralogy of this Western Australia mineral is to be given elsewhere.

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³ Heinrich, E. Wm., and Giardini, A. A., *Geol. Soc. Amer. Bull.*, 67, 12, 2, 1704 (1956).

Dependence on Oxygen and Temperature of the Sensitivity of Broad Bean Roots to γ -Radiation

MOTTRAM¹ claimed that the effect of ionizing radiation on the growth of bean roots was greater in the presence of oxygen or in the cold ($\sim 0^\circ\text{C}$). Since then the oxygen effect has been confirmed by Read² and shown in a wide variety of materials. No comparable generalization has been established, however, for temperature. Giles, Beatty and Riley³, investigating chromosome structural changes in