

ABSTRACT

Although C-glycosyl compounds occur widely in nature, there has been comparatively slow progress in the synthesis of this type of compound.

Part I of this thesis reviews the synthesis of C-glycosyl compounds whereas Parts II and III discuss the preparation of some C-glycosyl compounds and their derivatives from the parent sugars - arabinose, galactose, glucose, mannose and xylose.

Part IV discusses the mass spectrometry of some acetylated C-glycosyl compounds. Unlike other acetylated carbohydrate compounds, the primary fragmentation does not involve the loss of the substituent at C-1, but rather the loss of acetic acid from within the molecule.

The study of conformations is of significant importance in carbohydrate chemistry since a complete knowledge of the absolute configuration and conformation of the molecule is necessary for the study of chemical behaviour and reactions.

Recently physical methods - infrared spectroscopy, X-ray crystallography, nuclear magnetic resonance spectroscopy and optical rotatory dispersion - have

been used to determine the conformations of carbohydrate moieties.

The major portion of this thesis outlines the application of some of these methods to the conformations of C-glycosyl compounds.

Part V considers the n.m.r. spectroscopy of these compounds with special reference to the influence of the magnetic anisotropy of small aromatic aglycones on the anomeric proton and the C-2 acetoxy group. It is to be noted that this influence does not have a long range effect as is observed in the C-glycosyl flavones.

Part VI reports the I.R. spectra of some acetylated derivatives of C-glycosyl compounds for samples as potassium chloride discs. Analysis of the spectra revealed groups of absorption bands which showed a concerted shift according to anomeric disposition in the region below 900 cm^{-1} .

In Part VII the circular dichroism of some acetylated C-glycosyl benzenes has been measured in order to assign the stereochemistry of the derivatives. The sign of the 1L_b band appears to be diagnostic for the configuration at C-1, though the configurations of other asymmetric centres cannot be obtained due to the preponderances of benzene transitions in these molecules.