ABSTRACT

Chapter One reviews the major methods for the synthesis of singly branched-chain sugars. These sugars have attracted considerable interest because of their presence in some antibiotics.

Chapter Two, in part, reviews existing methods of selectively acylating one of two hydroxyl groups of some methyl 4,6-O-benzylidene-α-D-hexopyranosides. The exploration of the phase-transfer method of esterification and the development of a new method of acylation, using an acyl chloride, tetrabutylammonium iodide and potassium carbonate in benzene, are described for methyl 4,6-O-benzylidene-α-D-gluco-, allo- and galacto-pyranosides.

Chapter Three reviews some of the methods of preparation of hexenopyranosiduloses. A new efficient synthesis of these compounds is described. The method involves (a) the reduction of methyl 2-O-benzoyl-4,6-O-benzylidene-α-D-ribo-hexopyranosid-3-ulose with Grignard reagents, (b) the dehydration of the derived methyl 2-O-acetyl-3-C-alkyl-4,6-O-benzylidene-α-D-erythro-hex-3-enopyranoside and (c) the fragmentation of the alkene with methanolic hydrogen chloride to the hexenopyranosidulose.

Chapter Four describes the preparation of an epimeric pair of methyl 4,6-O-benzylidene-2-C,3-C-dimethyl-α-D-hexopyranosides, by the Grignard reduction of a 3-ulose. Contrary to prediction, the reduction did not result in the stereospecific formation of the allo-compound. A general route to the preparation