

SYNTHESES OF 4-(C-GLYCOSYL)ISOXAZOLINE N-OXIDES AND RELATED SUBSTANCES

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A new type of C-nucleoside; 4-(C-glycosyl)isoxazoline N-oxides and related substances were synthesized directly from aldehyde sugars by one-step cyclization with double moles of methyl nitroacetate in reasonable yield. The reaction of 2,3-O-isopropylidene-D-glyceraldehyde (1a) with two equivalents of methyl nitroacetate in the presence of an equivalent of diethylamine in N,N-dimethylacetamide afforded 3,5-bis(methoxycarbonyl)-4-(1,2-O-isopropylidene-D-glycero-dihydroxyethyl)isoxazoline N-oxide (2a) in 74 % yield. The same treatment of 2,3:4,5-di-O-isopropylidene-aldehyde-L-arabinose (1b) and aldehyde-D-glucose pentaacetate (1c) also gave the corresponding 4-(polyhydroxyalkyl)isoxazoline N-oxides (2b and 2c) which are considered to be promising precursors in the C-nucleoside synthesis.

Under similar reaction conditions 4-(aldofuranosyl)isoxazoline N-oxides; 3,5-bis(methoxycarbonyl)-4-(2,3-O-isopropylidene- β -D-erythrofuranosyl)isoxazoline N-oxide (2d), 3,5-bis(methoxycarbonyl)-4-(3-O-benzyl-1,2-O-isopropylidene- α -D-xylo-tetrafuranos-4-yl)isoxazoline N-oxide (2e), 3,5-bis(methoxycarbonyl)-4-(2,3,5-tri-O-benzyl- β -D-ribofuranosyl)isoxazoline N-oxide (2f), and its 2,3,5-tri-O-benzoyl analogue (2g) were synthesized from corresponding cyclic aldehyde sugars. Carbamoylation of 2 was achieved by treatment with butylamine or methanolic ammonia, giving 3,5-bis(butylcarbamoyl) or 3,5-dicarbamoyl derivatives of 2. Attempted deprotection of sugar moieties of 2 was also examined.