Time and Atom Economy Method for the Synthesis of (1-6) Linked Glycosides

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Carbohydrates with (1-6)-linkage between monosaccharide units either in pyranoside or furanoside form are common in the structures of polysaccharides isolated from pathogenic bacteria and fungi [1]. The synthetic fragments of such biopolymers are of a high interest as molecular probes for immunological investigations and drug design. The preparation of these structures required the development of efficient time and atom economy methods for their chemical synthesis. Herein we aimed to develop the direct protocol of regio- and stereoselective glycosylation of unprotected acceptor for the synthesis of beta-(1-6)-linked digalactosides [2]. We report the systematic investigation of conditions influence (solvent, temperature, protective and leaving groups [3] in glycosyl donor) on glycosylation outcome which allowed finally the optimal protocol. Moreover, we find that obtained dipyranoside structure can be converted into difuranoside one under acid-promoted per-O-sulfation condition [4]. This reaction opens new original way to the synthesis of beta-(1-6)-linked furanoside fragments and significantly expands the applicability of developed unprotected glycosylation protocol for the synthesis of carbohydrate structures of biological importance.

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