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Silver Salt-Mediate Benzylation of Carbohydrates Under Mildly Acidic Conditions

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SILVER SALTS-MEDIATED BENZYLATION OF CARBOHYDRATES UNDER MILDELY ACIDIC CONDITIONS

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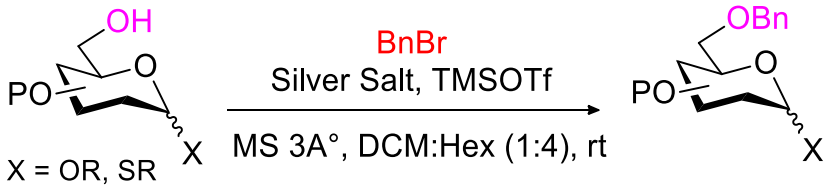
When looking at biomolecules, carbohydrate represent a large group of macromolecules that play an important role in the body. Most importantly, carbohydrates provide an energy supply for organisms, but it is proven that they are also involved in a myriad of other processes. Furthermore, synthesizing these molecules leads to advancements in chemistry, such as drug design, and other structures such as glycolipids play important roles in the immune system. Understanding this, an efficient and reliable way to create these carbohydrates is needed.

The protection and deprotection manipulations of carbohydrates play an essential role in synthetic carbohydrate chemistry.[1] Using benzyl ethers as protecting groups for hydroxyls is a standard way of obtaining efficient building blocks in carbohydrate chemistry.[2] Uniform benzylation of carbohydrates can be efficiently achieved, but it typically requires excess reagents and/or harsh reaction conditions.[3] Methods for mild and regioselective benzylation are not available at all. Herein, we report the investigation of a new benzylation reaction that makes use of mildly acidic conditions. The main focus of this study is to identify suitable silver salts that would provide high regioselectivity, excellent yields, and help minimize side reactions.



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(1) Wang, T.; Demchenko, A. V. Synthesis of carbohydrate building blocks via regioselective uniform protection/deprotection strategies. *Org. Biomol. Chem.* **2019**, *17*, 4934-4950.
(2) Cao, Y.; Okada, Y.; Yamada, H. Facile and regioselective preparation of partly O-benzylated D-glucopyranose acetates via acid-mediated simultaneous debenzylation-acetolysis. *Carbohydr. Res.* **2006**, *341*, 2219-2223.
(3) Malik, S.; Dixit, V. A.; Bharatam, P. V.; Kartha, K. P. A simple, mild, and regioselective method for the benzylation of carbohydrate derivatives promoted by silver carbonate. *Carbohydr. Res.* **2010**, *345*, 559-564.