SILVER SALT-MEDIATED BENZYLATION OF CARBOHYDRATES UNDER MILDLY ACIDIC CONDITIONS

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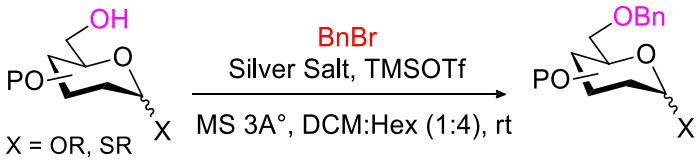
When looking at biomolecules, carbohydrates represent a large group of macromolecules that play many important roles in the body. Carbohydrates provide an energy supply for organisms, but it is proven that they are also involved in a myriad of other processes and every major disease. For example, severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2), which has recently led to a pandemic all over the world, uses its spike glycoprotein to bind to receptors and mediate virus entry.[1] To date, no effective treatments for the associated disease COVID-19 have been discovered, but understanding how SARS-CoV-2 enters cell provides valuable information for drug design. Chemical synthesis of carbohydrates leads to advancements in chemistry, offers excellent opportunities for experimental training in the lab, and paths the way towards carbohydrate-based drug discovery.

The protection and deprotection manipulations with carbohydrates play essential roles in synthetic carbohydrate chemistry.[2] Using benzyl ethers as protecting groups for hydroxyls is a standard way of obtaining differentially functionalized building blocks in carbohydrate chemistry.[3] Uniform benzylation of carbohydrates can be efficiently achieved, but it typically requires excess reagents and/or harsh reaction conditions.[4] Methods for mild and regioselective benzylation are hardly 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 efficiently mediate this reaction and help to obtain high regioselectivity, excellent yields, and minimize side reactions.



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