Synthesis of fluorescent 2,1,3-benzothiadiazole-triazole-linked glycoconjugates

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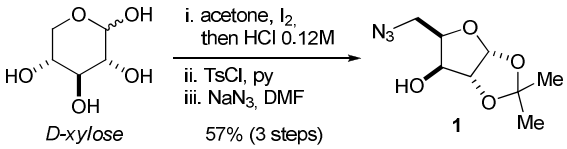
INTRODUCTION

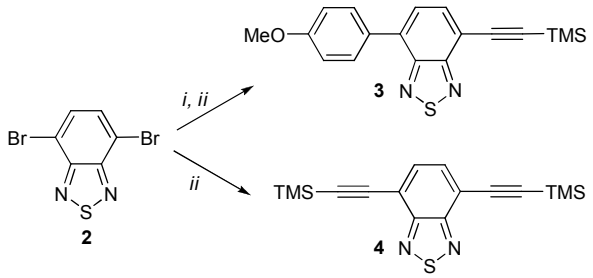
Fluorescent 2,1,3-benzothiadiazol (BTD) derivatives have been described as useful dyes.[1] In this context, the synthesis of carbohydrate functionalized BTDs is an interesting strategy for glycoconjugation and also a promising approach for chiral fluorescent molecules with many potential applications as chemosensors.[2] Herein we report our results on the synthesis of BTD-triazol-linked glycoconjugates through a Cu(I)-catalyzed alkyne-azide cycloaddition.

RESULTS AND DISCUSSION

Initially, we prepared the sugar azide **1** in an efficient sequence, starting from *D*-xylose. The azide was obtained in 57% yield, over 3 steps, without chromatographic purifications.[3]

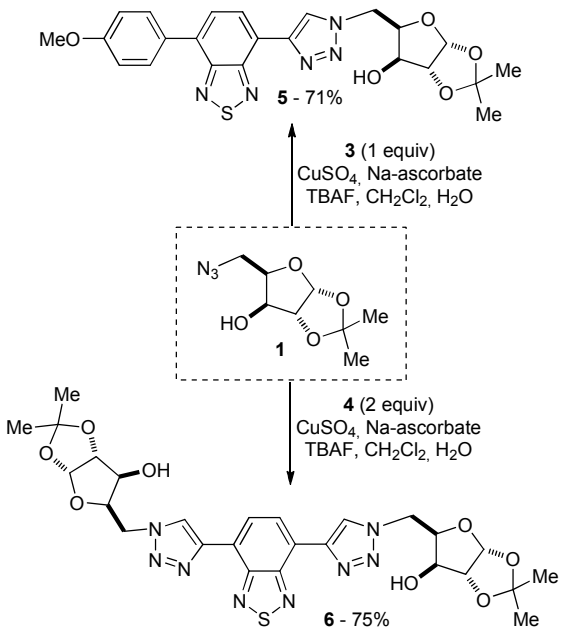


Next, the BTD-dibromide **2** was converted in protected acetylenes **3** and **4**, by palladium-catalyzed reactions. When **2** was subjected to Suzuki coupling, followed by a Sonogashira reaction, the unsymmetrical alkyne **3** was obtained. On the other hand, direct double Sonogashira reaction resulted in symmetrical acetylene **4**.



i. 4-OMePhB(OH)$_2$, Pd(PPh$_3$)$_4$, CsF, toluene
ii.TMS-acetylene, PdCl$_2$(PPh$_3$)$_2$, CuI, PPh$_3$, Et$_3$N

With these the required starting materials the cycloaddition reactions were performed. Gratifyingly, reaction of sugar azide **1** with alkynes **3** and **4**, under copper catalysis, in the presence of sodium ascorbate and TBAF, smoothly resulted in the BTD-triazole-glycoconjugates **5** and **6** in 71 and 75% yield, respectively.



CONCLUSION

In summary, we have accomplished the synthesis of fluorescent BTD-triazole-linked glycoconjugates. Studies with different sugar azides, as well as of the photophysical properties of these compounds are now underway.

ACKNOWLEDGEMENTS

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