Synthesis and photophysical properties of a Tröger's base-triazole-linked glycoconjugate

Débora M. Pimentel,* Jaqueline P. Vargas, Diogo S. Lüdtke, Fabiano S. Rodembusch

Departamento de Química Orgânica, Instituto de Química-UFRGS, Av. Bento Gonçalves 9500,

CEP 91501-970 Porto Alegre, RS, Brazil.

**debora.pimentel@ufrgs.br*

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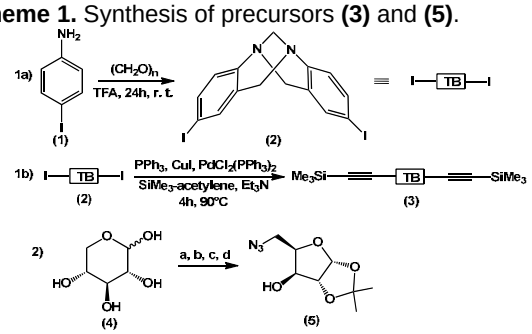
INTRODUCTION

Tröger's base is a chiral amine discovered by Julius Tröger in 1877, which exists as two enantiomers.[1] Its intrinsic concavity and rigid structure can provide several applications.[2] On the other hand, carbohydrates are the most abundant renewable resource in the planet, and they have interesting applications.[3] Additionally, an efficient way of connecting a carbohydrate to a Tröger's base framework is a 1,3-dipolar cycloaddition reaction - *"Click Chemistry".* In this way, we present the synthesis and photophysical characterization of a new Tröger's base analogue containing a carbohydrate as ring substituent.

RESULTS AND DISCUSSION

The synthesis of the precursors, an alkyne Tröger's base derivative (**3**) and an azide based carbohydrate (**5**), is performed according to Scheme 1.

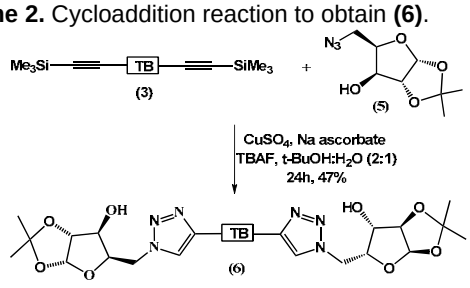
Scheme 1. Synthesis of precursors **(3)** and **(5)**.



Reaction conditions: (a) $I_{2(cat)}$, acetone, reflux, 3h; (b) HCl 0.12 M, r.t., 1h; (c) *p*-TsCl, pyridine, r.t., 3h; (d) NaN_3, DMF, 80ºC, 48h.

Precursors **(3)** and **(5)** react in a cycloaddition reaction to form **(6)** (Scheme 2).

Scheme 2. Cycloaddition reaction to obtain **(6)**.



The product was fully characterized and its formation could be confirmed by ^{1}H-NMR due to the signal of the hydrogen of the triazole ring located at 8,45 ppm (Figure 1).

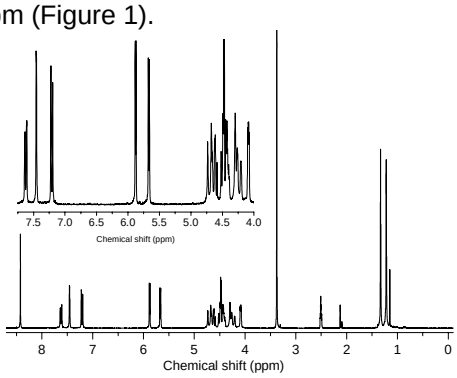


Figure 1. ^{1}H-NMR spectrum of **(6)** (DMSO-d^6, 300 MHz).

A photophysical study in solution was carried out with absorption and emission in the UV region (Figure 2).

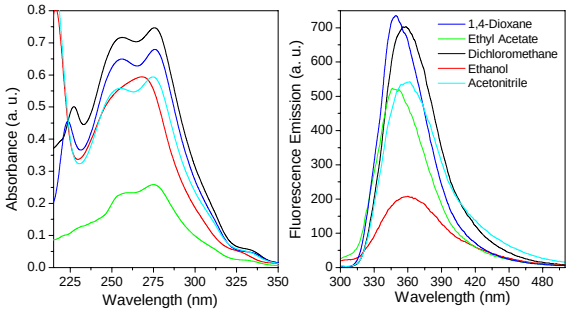


Figure 2. Absorption and fluorescence emission of **(6)**.

CONCLUSION

The click chemistry was useful in order to obtain new fluorescent glycoconjugates based on Tröger's bases. Potential applications will be studied further, as well as the synthesis of new Tröger's base analogues containing different substituents.

ACKNOWLEDGEMENTS

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REFERENCES

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