



C5 atom of D-galactopyranose as a source of chirality: preliminary results

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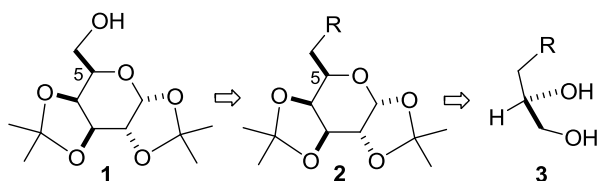
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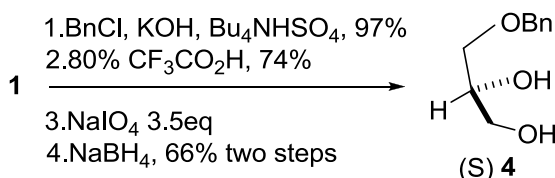
INTRODUCTION

Carbohydrates,¹ terpenes² and aminoacids³ are widely used chiral-pool substrates for stereoselective synthesis. D-Galactose is a convenient compound in this context since it is the only easily available sugar furnishing its derivative, viz. **1**, which displays primary OH group in a single protecting step. We reasoned that **1** can be further extended to get **2**, which upon degradation would furnish the chiral products **3**. The stereogenic center present in **3** is the C5 atom in **1**. The objective of this communication is to present preliminary results of such investigation.



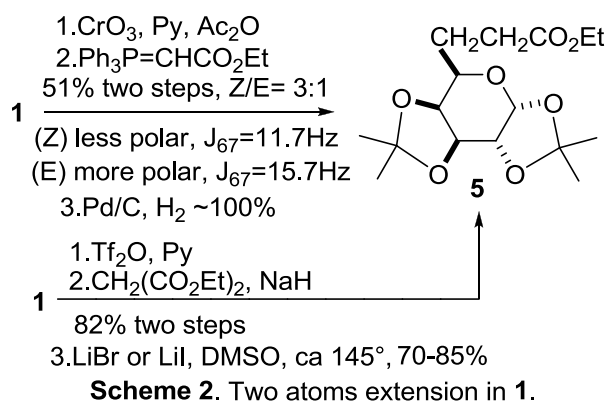
RESULTS AND DISCUSSION

The idea presented above was tested as shown in the Scheme 1 and permitted isolation of the expected diol (S)-**4**.



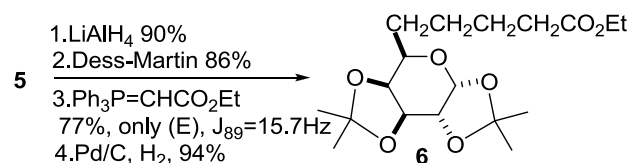
Scheme 1. C5 atom in the di-O-isopropylidene- α -D-galactopyranose **1** as a source of chirality in the glycerol **4**: a model reaction.

Having confirmed the viability of the concept, an extension at the C6 position in **1** to get **5** and **6** was performed to obtain the substrates for synthesis of the (R) diols **7**. The compound **5** was obtained from **1** via oxidation, two carbon atoms extension and hydrogenation. Alternatively, **5** was prepared via substitution at the C6 position using sodium malonate followed by dealquillative decarboxylation (**Scheme 2**).



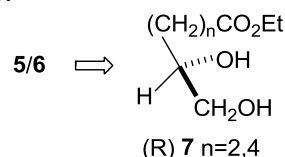
Scheme 2. Two atoms extension in **1**.

5 was used to get **6** with two more C atoms in a side chain (**Scheme 3**):



Scheme 3. Four atoms extension in **1**.

The compounds **5** and **6** will be used to obtain the targets (R)-**7** by analogy to the procedure shown in the **Scheme 1**.



CONCLUSION

C5 atom in D-galactopyranose was used as a source of chirality to obtain the (S) glycerol **4**. Side chain extended D-galacto compounds **5** and **6** were obtained. Their application to get the diols (R) **7** will be reported in due course.

REFERENCES

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