

# Dehydration of D-mannitol: building block for C-nucleoside synthesis

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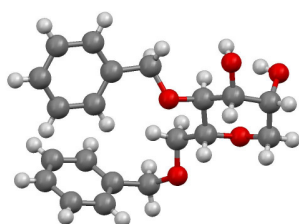
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## INTRODUCTION

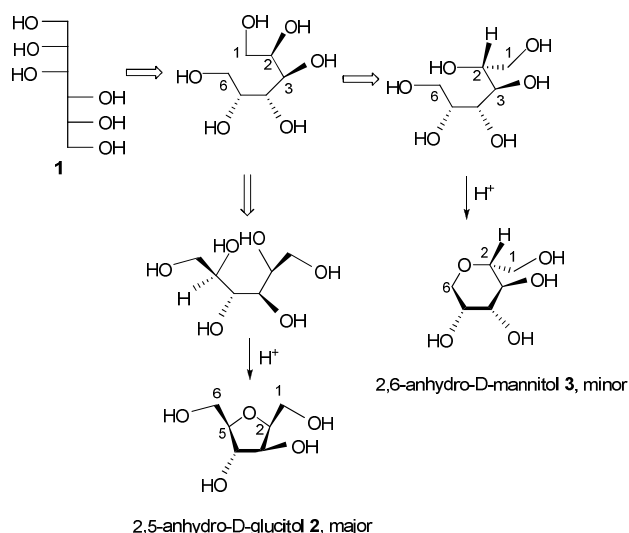
D-Mannitol **1** is a convenient starting material for organic synthesis because of the homotopic relation between the upper and the lower part of the molecule. For this reason dehydration of **1** via 2-5 hydroxyl groups yields one product only, i.e. 2,5-anhydro-D-glucitol **2**. Our interest in **2** and its derivative **5** stems from a possibility of application of the latter for C-nucleoside synthesis. Acid catalyzed dehydration of **1** was performed followed by some manipulations, and permitted isolation of the 2,5-anhydro-4,6-di-O-benzyl-D-glucitol **5**, together with 2,6-anhydro-1,3-di-O-benzyl-D-mannitol **7** (or 1,5-anhydro-4,6-di-O-benzyl-D-mannitol due to a symmetry of **1**). A structure of **7** was confirmed by x-ray analysis.

## RESULTS AND DISCUSSION

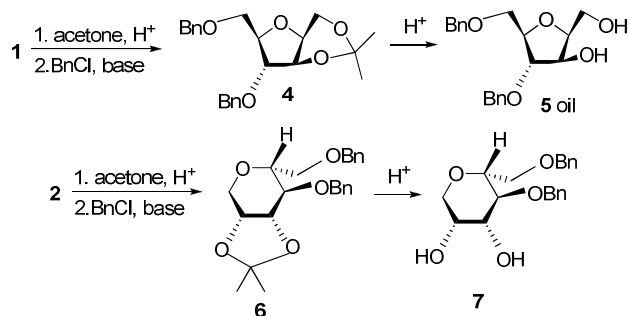
Acid-catalyzed dehydration of **1** was realized following patented procedure<sup>1</sup> which we modified to facilitate isolation of the products on a smaller scale.<sup>2</sup> Modification is to subject a crude dehydration mixture to isopropylidenation, and to isolate the main product, 1,3-isopropylidene-D-glucitol, via vacuum dry chromatography<sup>3</sup>, instead of high vacuum distillation.<sup>1</sup> Further operations shown in the **Scheme 2** permitted isolation of the necessary derivative **5**. In some preparations we obtained more polar and highly crystalline compound **7**, whose x-ray structure is shown in **Picture 1**. Application of **5** to get C-nucleoside analogs will be published in due course.



**Picture 1.** X-Ray structure of **7**



**Scheme 1.** Acid-catalysed dehydration of D-mannitol



**Scheme 2.** Synthesis of di-O-benzylated derivative **5** and **7**.

## CONCLUSION

Synthesis of dibenzylated derivative of D-glucitol **5** and of D-mannitol **7** was achieved.

## REFERENCES

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- Harwood, L.M. *Aldrichim. Acta*, **1985**, *18*, 25.