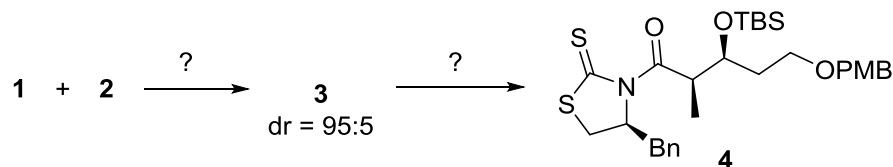
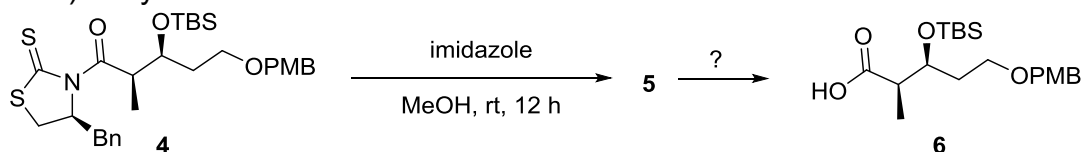


From a total synthesis of a natural product derivative

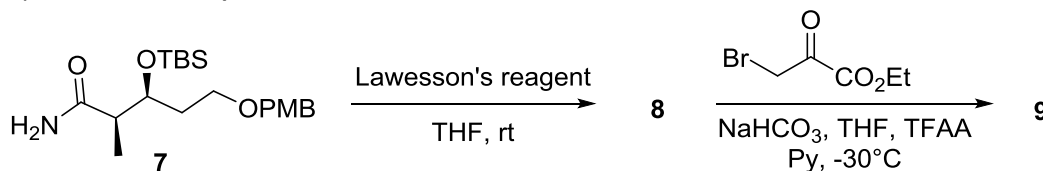
Problem:



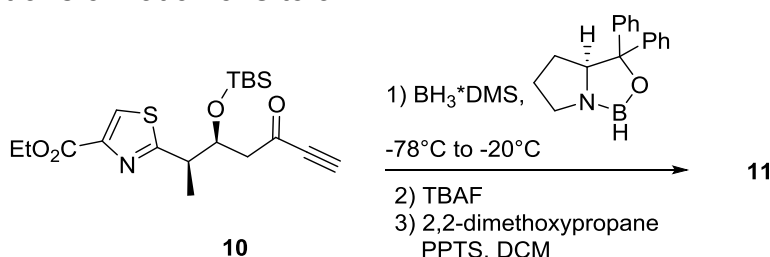
- Please give the reaction sequence with the compounds **1**, **2** and **3** as well as the conditions for the transformations.
 - Explain the stereochemical outcome in the first reaction by an appropriate model.
 - Why a thiazolidinethione was used instead of an oxazolidone?



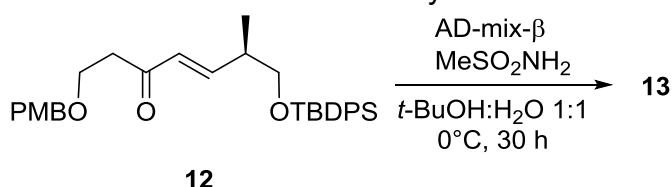
- What is the product **5** and how is it converted into **6**?



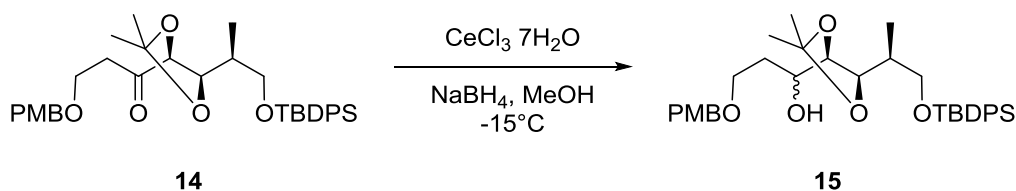
- Please give the products **8** and **9** as well as the mechanism for the transformation of **8** to **9**.



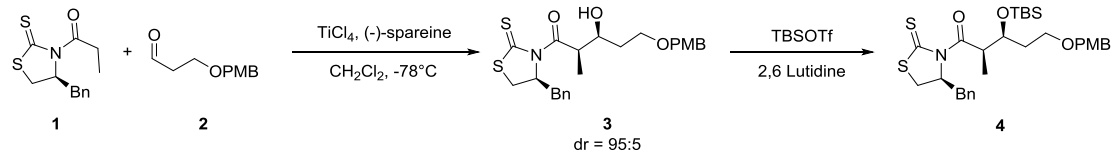
- What is the name of the reaction? Please give the product **11** and a rationale for the stereochemistry.



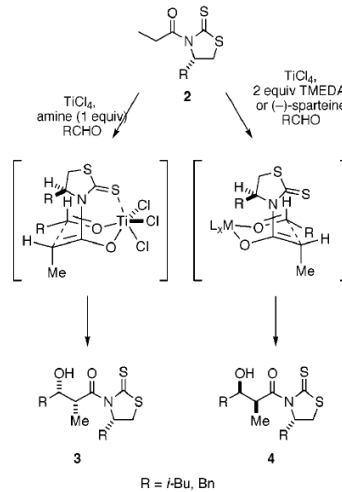
- What is the product **13** and what is the name of the transformation? Give a mechanism.



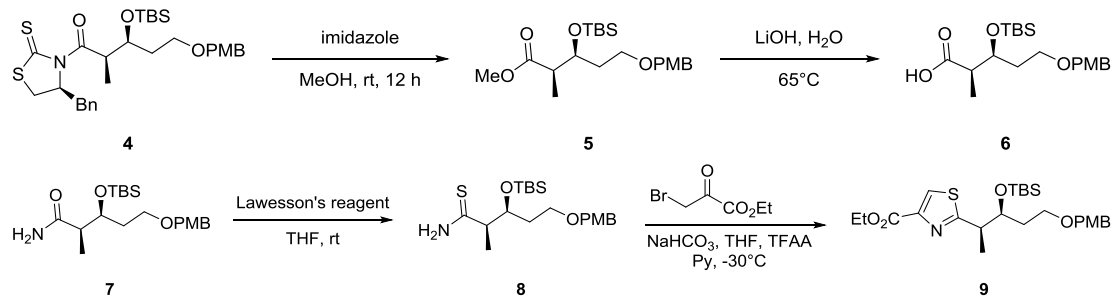
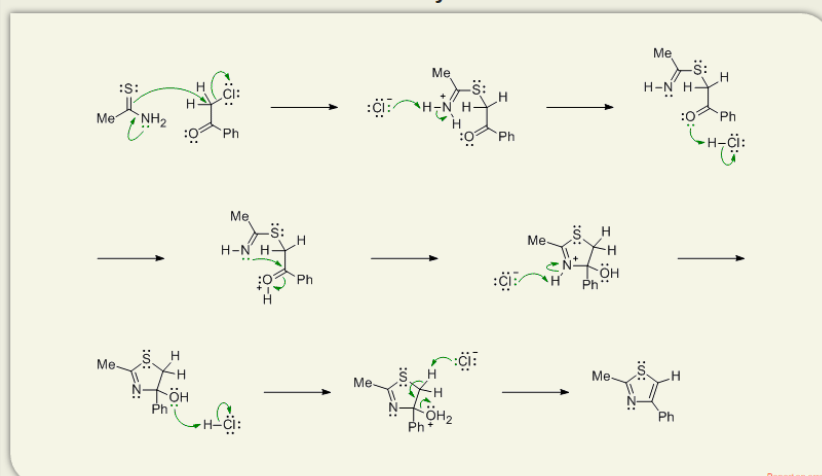
- Predict the stereochemistry for the reduction by applying an appropriate model. Can you explain why Luche conditions were used for the reduction?

Solution:

The thiazolidinethione has an increased nucleophilicity which results in the formation of a highly ordered transition state. This leads to the non-Evans syn product. Interestingly the use of 2 equiv. of base leads to the Evans syn product by disfavoring the chelation to the thiocarbonyl by the metal center.

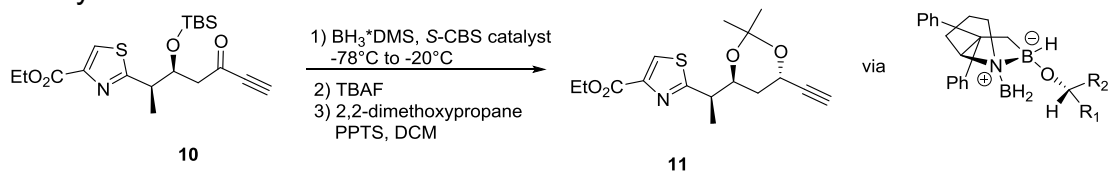


Moreover, the thiazolidinethione are easily removable as well as convertible to other functional groups.

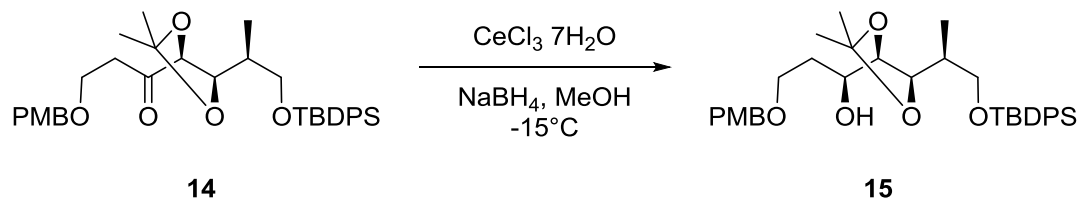
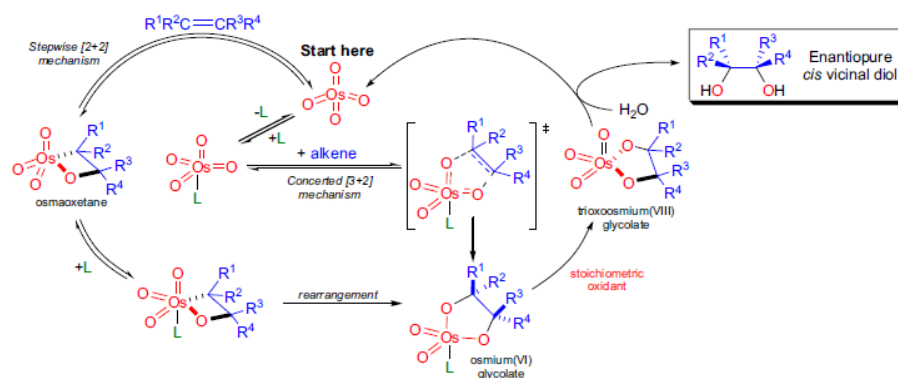
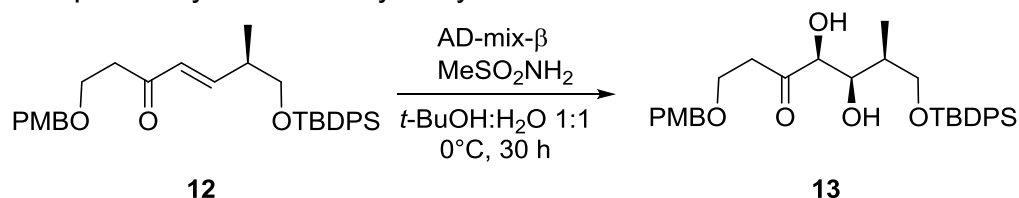
**Mechanism of the Hantzsch Thiazole Synthesis****Reference**

Original reference [Ber. Dtsch. Chem. Ges. 1887, 20, 3118.](#)

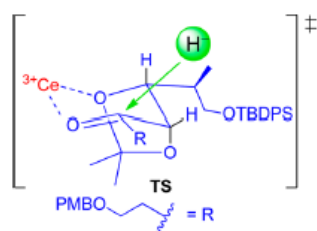
Corey-Bakshi-Shibata-reduction:



Sharpless asymmetric Dihydroxylation:



Via:



References:

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doi: 10.1021/acs.joc.5b02426
- http://www.synarchive.com/named-reactions/Hantzsch_Thiazole_Synthesis (accessed on 06.03.2016)
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- Crimmins, M. T. Chaudhary K. *Org. Lett.* **2000**, 2, 775-777

Keywords:

Total synthesis, stereoselective reduction, dihydroxylation, Hantzsch methodology for thiazole synthesis