

Modern Organic Chemistry

20-06-2011

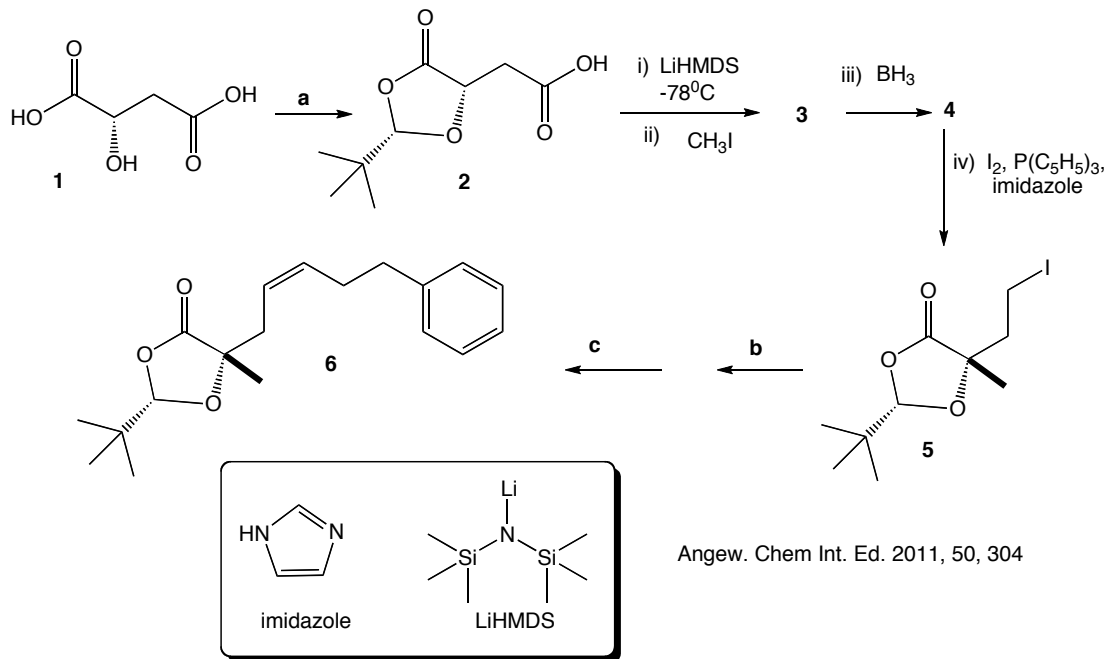
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Every answer sheet must be provided with your name,
study and student number

(The maximum points for every question is indicated)

question 1.(25 points)

Part of the synthetic route to Leiodolide B is shown in the scheme.



a) Provide the reagents **a**, that can be used to convert **1** into **2** and the mechanism of the corresponding reaction.

b) Provide the structure of compound **3** and the mechanism of the corresponding reaction.

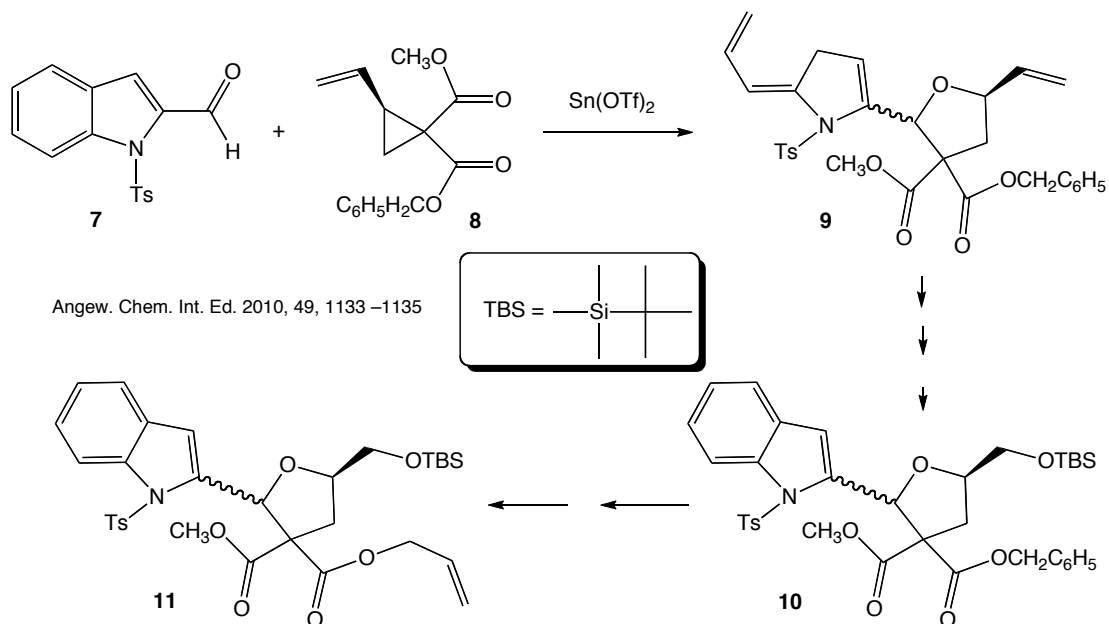
c) Provide the structure of compound **4** and the mechanism of the corresponding reaction.

d) Provide the mechanism of the conversion of **4** into **5**.

e) Provide the reactions and corresponding reagents, which can be used to convert compound **5** into **6**

Question 2. (15 points)

Part of the synthetic route to (+)-Isatisine A is depicted in the scheme.



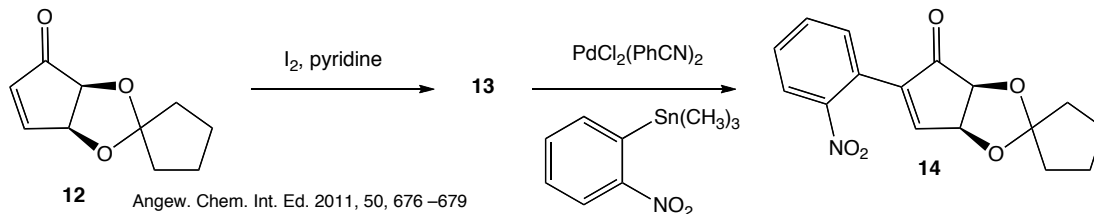
a) Reaction of **7** with **8** under influence tin(II) triflate leads to the formation of **9**. Provide the mechanism this reaction.

b) Compound **9** can be converted into **10**. Select the reactions and reagents that allow this conversion. Provide the structures of the intermediates.

c) Compound **10** can be converted into **11**. Select the reactions and reagents that allow this conversion. Provide the structures of the intermediates.

Question 3. (10 points)

Part of the synthetic route to Phalarine is depicted in the scheme.

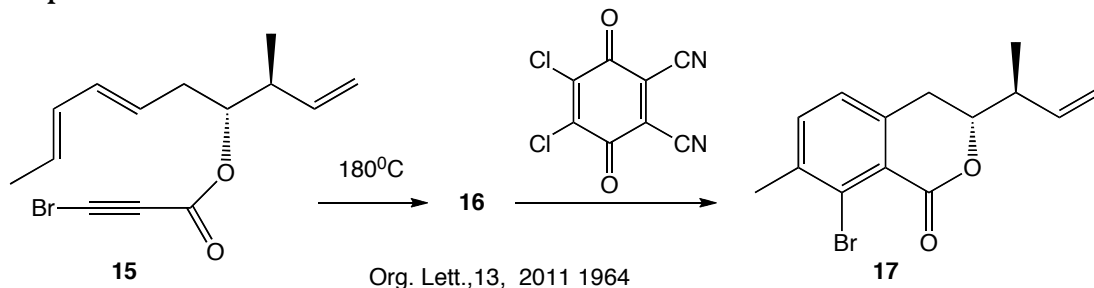


a) Reaction of **12** with iodine in pyridine gives **13**. Provide the structure of **13** and the mechanism of the conversion of **12** into **13**.

b) Provide the mechanism of the conversion of **13** into **14**.

Question 4. (10 points)

Part of the synthetic route to 8-Deshydroxyajudazol B is depicted in the scheme.

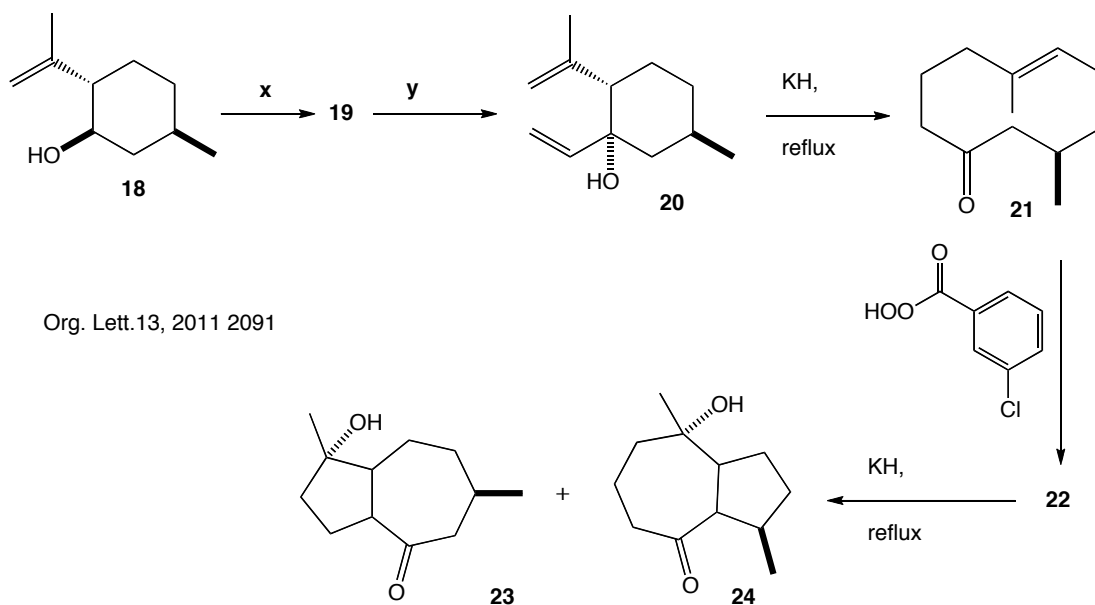


a) Heating of **15** leads to **16**. Provide the structure of **16** and the mechanism of this conversion.

b) Provide the mechanism of the conversion of **16** into **17**.

Question 5 (20 points)

Part of the synthetic route to (-)-9-Deoxy-englerin A is depicted in the scheme.



a) Starting compound **18** is converted into compound **20**. Give the reagents **x** and **y** and the structure of intermediate **19** that can be used for this conversion.

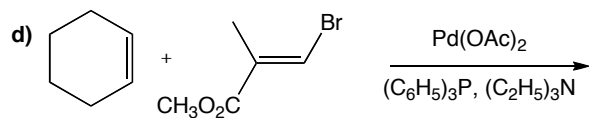
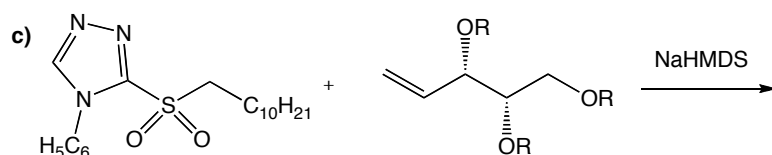
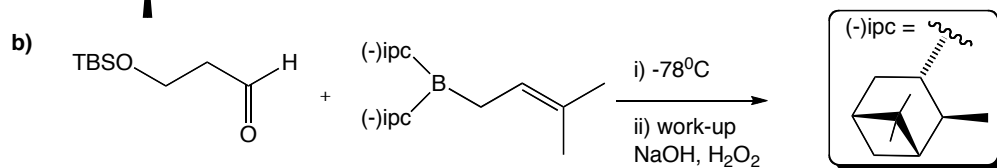
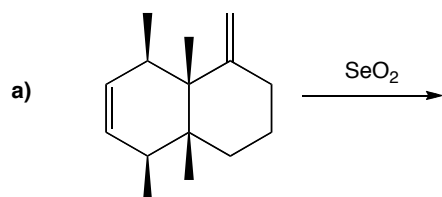
b) Provide the mechanism of the conversion of **20** into **21**.

c) Treatment of **21** with MCPBA leads to **22**. Provide the structure of **22** and the mechanism of this conversion.

d) Provide the mechanism of the conversion of **22** into **23** (or **24**).

Question 6. (20 points)

Provide the structures of the products and the mechanisms of the following reactions.



a) J. Am. Chem. Soc. 2010, 132, 5966–5967 b) Angew. Chem. Int. ed. 1997, 136, 523 c) Helvetica Chimica Acta (2011), 94, 669 2011 d) J. Org. Chem. 46, 1067 (1980)