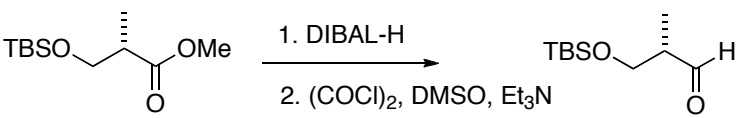


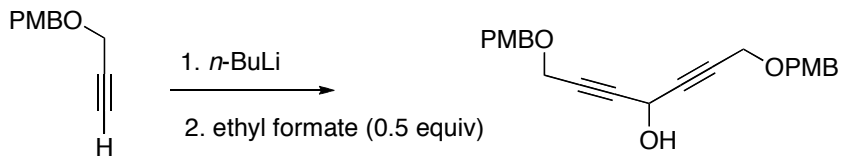
Chem 635
March 20, 2007

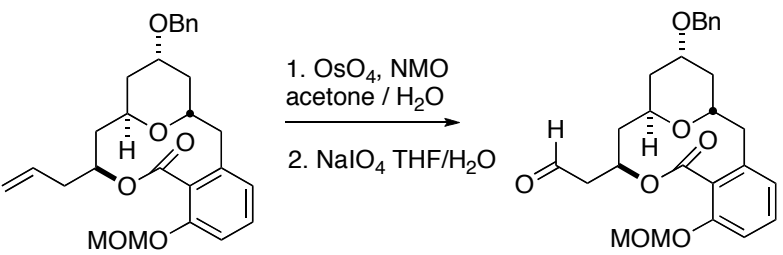
Exam #1

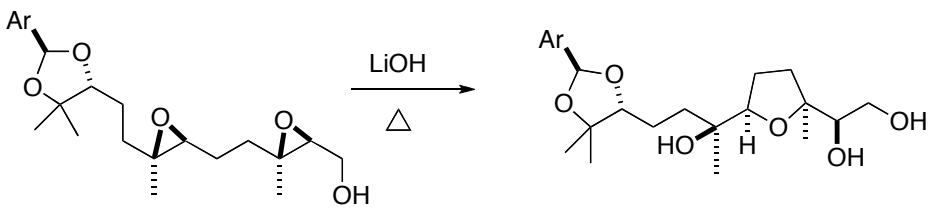
This is an open-book, open-notes exam. You may take up to three hours. For each transformation shown, draw detailed arrow-pushing mechanisms for each step, including the explicit chemical structure of every reactant and reagent shown (show every heavy atom – H's not required), all stereochemistry, and all the organic products of each reaction. The abbreviations are exactly as they appear in the publication.

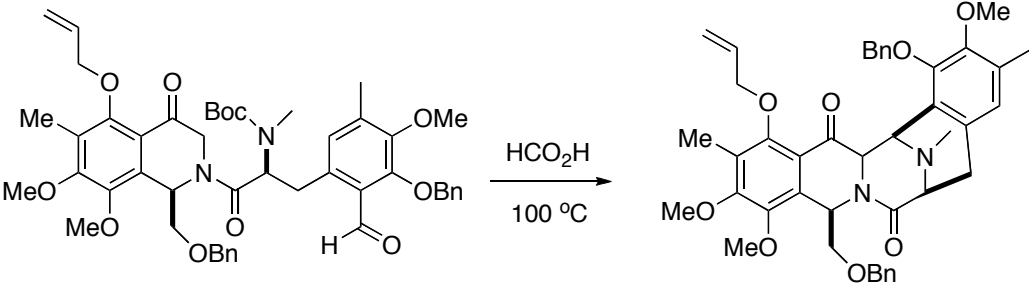
Each problem is worth twenty points.

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1. CCOC(=O)C(C)(C)OSi(C)(C)C(C)(C)C $\xrightarrow[2. \text{(COCl)}_2, \text{DMSO, Et}_3\text{N}]{1. \text{DIBAL-H}}$ CC=OCC(C)(C)OSi(C)(C)C(C)(C)C
- 

2. CC#CCO $\xrightarrow[2. \text{ethyl formate (0.5 equiv)}]{1. n\text{-BuLi}}$ CC#CC(O)C=C
- 

3. C=CC12OC3C(OBn)OC4C1OC(=O)C5C(C=C)C=C5C42OC3 $\xrightarrow[2. \text{NaIO}_4, \text{THF/H}_2\text{O}]{1. \text{OsO}_4, \text{NMO, acetone / H}_2\text{O}}$ C=OCC12OC3C(OBn)OC4C1OC(=O)C5C(C=C)C=C5C42OC3
- 

4. ArC1OC2C(C)OC3C1OC4C(C)OC5C3OC(O)C52 $\xrightarrow[\Delta]{\text{LiOH}}$ ArC1OC2C(C)OC3C1OC4C(C)OC5C3OC(O)C52
- 

5. CC1=C(C)C(OC)C(OC)C(OC)C1C(=O)N(C)C(=O)N(C)C(=O)C2=C(C)C(OC)C(OC)C2C(=O)N(C)C(=O)N(C)C(=O)C3=C(C)C(OC)C(OC)C3 $\xrightarrow[100\text{ }^\circ\text{C}]{\text{HCO}_2\text{H}}$ CC1=C(C)C(OC)C(OC)C(OC)C1C(=O)N(C)C(=O)N(C)C(=O)C2=C(C)C(OC)C(OC)C2C(=O)N(C)C(=O)N(C)C(=O)C3=C(C)C(OC)C(OC)C3

