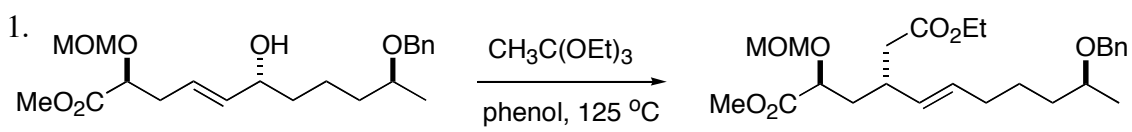


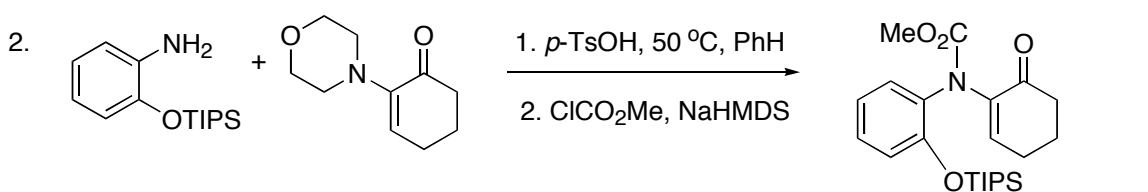
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March 21, 2006

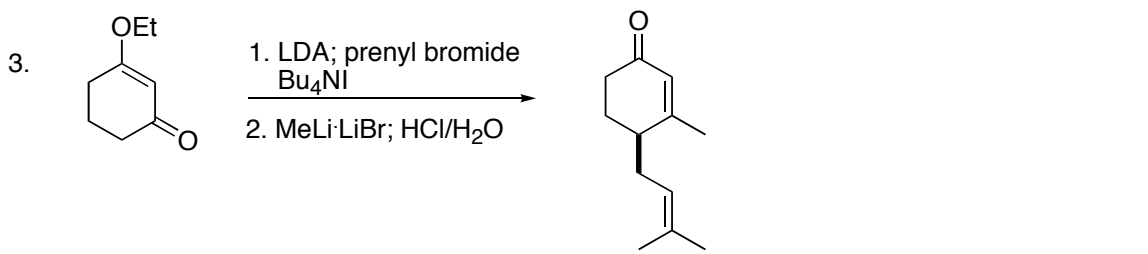
Exam #1

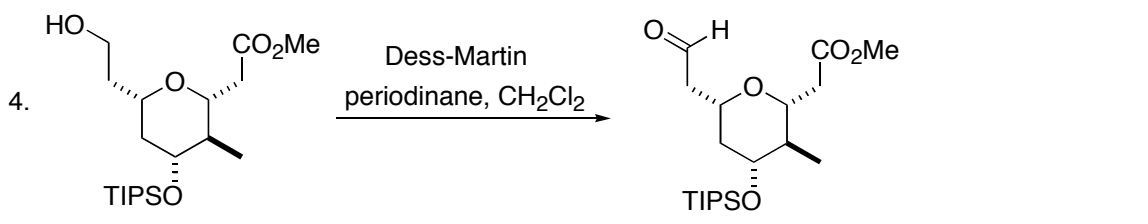
This is an open-book, open notes exam. You may take up to three hours. For each transformation shown, draw detailed arrow-pushing mechanisms for each step, including the explicit chemical structure of every reactant and reagent (show every heavy atom - H's not required), all stereochemistry, and all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

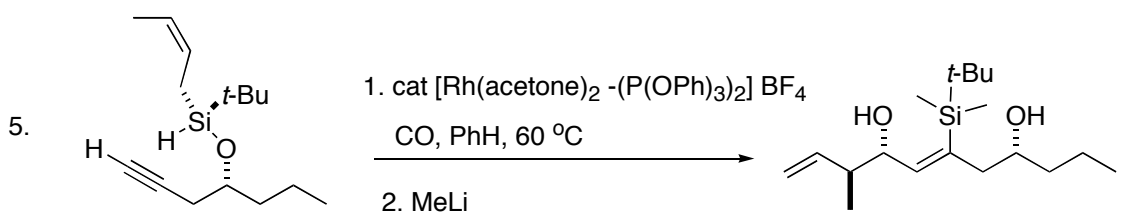
Each problem is worth twenty points.

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1. CC(C)C(O)C=C(COC(=O)C)COC(=O)C $\xrightarrow[\text{phenol, 125 } ^\circ\text{C}]{\text{CH}_3\text{C}(\text{OEt})_3}$ CC(C)C(O)C=C(COC(=O)C)COC(=O)C
- 

2. Nc1ccc(OC(C)(C)C)cc1 + C1=CC(=O)C=CCN1C2CCOCC2 $\xrightarrow[2. \text{CICO}_2\text{Me, NaHMDS}]{1. \text{p-TsOH, 50 } ^\circ\text{C, PhH}}$ C1=CC(=O)C=CCN1C2C=CC(=O)C=C2
- 

3. CCOC(=O)C1=CC(=O)C=CC1 $\xrightarrow[2. \text{MeLi-LiBr; HCl/H}_2\text{O}]{1. \text{LDA; prenyl bromide, Bu}_4\text{NI}}$ CCOC(=O)C1=CC(=O)C=C(C)C1C=C(C)C
- 

4. CCOC(=O)C1=CC(O)C=CC1 $\xrightarrow{\text{Dess-Martin periodinane, CH}_2\text{Cl}_2}$ CCOC(=O)C1=CC(O)C=CC1
- 

5. CC(C)C(O)C=C(C)C=C(C)C $\xrightarrow[2. \text{MeLi}]{1. \text{cat } [\text{Rh}(\text{acetone})_2 - (\text{P}(\text{OPh})_3)_2] \text{BF}_4, \text{CO, PhH, 60 } ^\circ\text{C}}$ CC(C)C(O)C=C(C)C=C(C)C