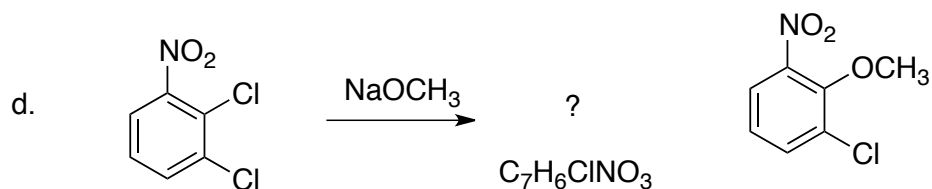
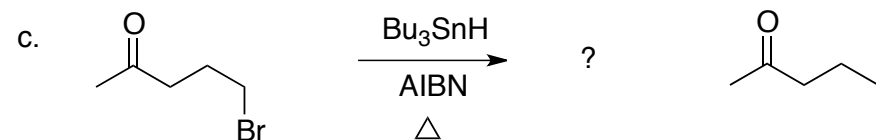
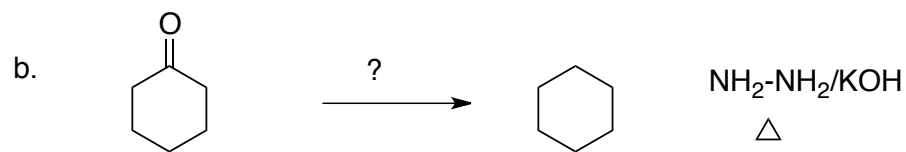
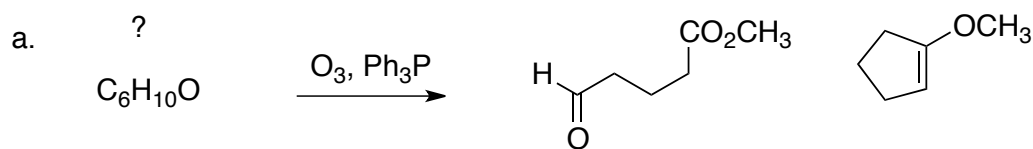


Chem 332  
Spring 2012  
Exam #3  
April 20, 2012

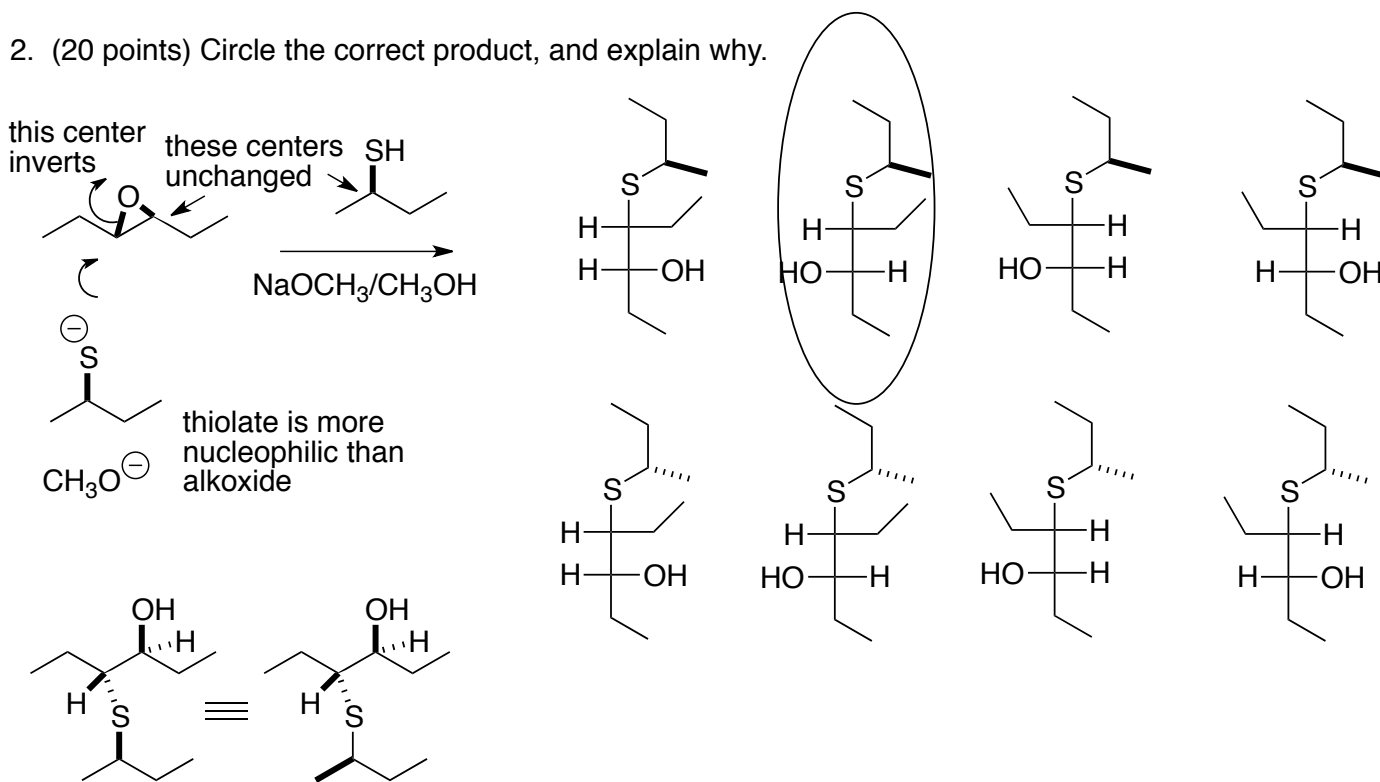
Name\_\_key\_\_\_\_\_

This is an open-book, open notes exam. No electronic devices are allowed.

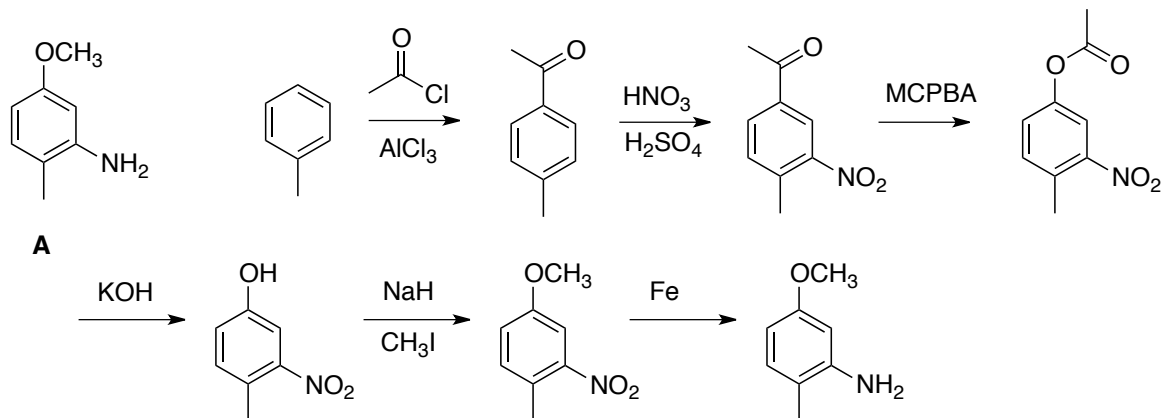
1. (5 points each) Fill in the missing starting material, reagent or product.



2. (20 points) Circle the correct product, and explain why.

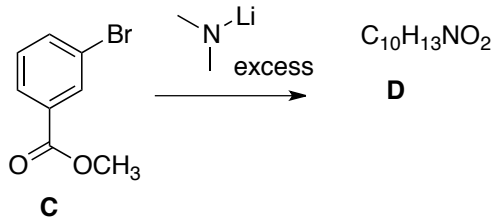


3. (20 points) Using any piece that contributes three or fewer carbons to the final product, and any monosubstituted benzene derivative that contributes at most seven carbons to the final product, outline a synthesis of **A**.



4. (20 points) Deduce the structure of **C**, and draw an arrow-pushing mechanism for its formation.

IR: 3060, 3041, 2987, 1696, 1608  $\text{cm}^{-1}$

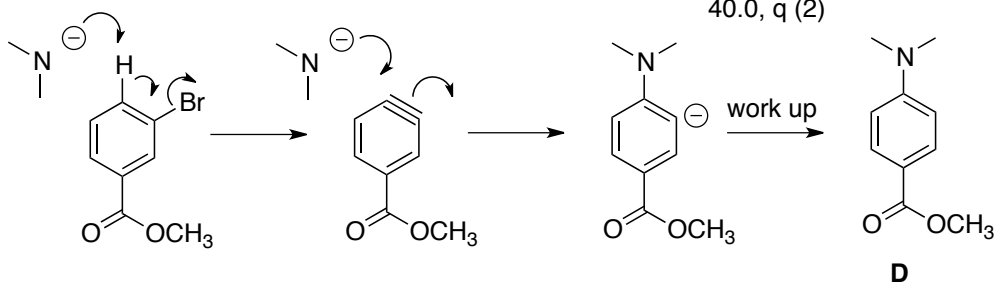


$^{13}\text{C}$  NMR:

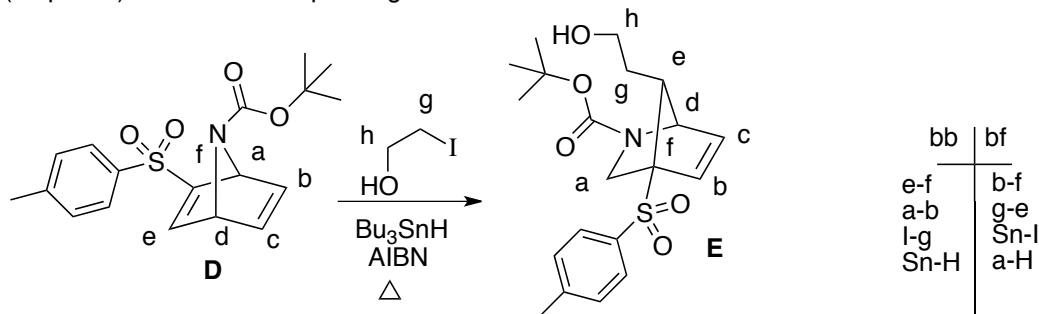
167.1, s  
153.3, s  
131.2, d (2)  
117.5, s  
110.7, d (2)  
51.0, q  
40.0, q (2)

$^1\text{H}$  NMR:

7.92, d,  $J=9.0$  Hz, 2H  
6.67, d,  $J=9.0$  Hz, 2H  
3.85, s, 3H  
3.04, s, 6H



5. (20 points) Draw an arrow-pushing mechanism for the conversion of **D** to **E**.



|      |      |
|------|------|
| bb   | bf   |
| e-f  | b-f  |
| a-b  | g-e  |
| l-g  | Sn-I |
| Sn-H | a-H  |

