CEM 850 Quiz-1
September 16, 2015

This quiz consists of 3 pages. Please make certain that your exam has all of the necessary pages. Total points possible for this quiz are 40. In answering your questions, please write legibly and draw all structures clearly. Write all your answers in the exam booklets. Good luck.

I. Provide conditions that would efficiently and selectively convert A into B and C. (6 pts)

II. The conversion of B into D would be a challenge using traditional enolate alkylation chemistry. Why? (2 pts)

III. Alkylation of the thermodynamic enolate of E affords F as the major product. Illustrate the transition structures that would afford both F and G. (6 pts)

IV. Which product (F or G) would be favored if H was used as the starting material? (2 pts)
V. Provide the product or products of the reactions outlined below. Show all intermediate compounds and be sure to indicate the product’s relative or absolute stereochemistry. For reactions where multiple products are possible, be sure to indicate the major and minor species. (12 pts)

1. cat. TsOH, PhH

![](image1.png)

2. 1. CuI; then 2 equiv

2. –78 °C to –30 °C to –78 °C

3. ICH₂CO₂Et

![](image2.png)

3. 1. cyclohexylamine, cat. TsOH

2. EtMgBr

3. PhCH₂Cl, THF, reflux

![](image3.png)

4. 1. Et₃N, DMF; TMSCl

2. 1 equiv MeLi; then allyl bromide

![](image4.png)

VI. The reaction shown below involves an extended enolate formation, followed by a 1,4-addition. The resultant new enolate is then treated with excess LDA to afford the dienolate. This dienolate then undergoes another 1,4-addition, which upon aqueous workup affords the final product. Provide a detailed arrow pushing mechanism for this sequence. (6 pts)

LDA, THF, –78 °C; then

![](image5.png)
In class we discussed the multi-step process to convert cyclohexanone to 2-(i-Pr)cyclohexanone.

A variation of this process allows one to perform a net alkylation at the more substituted carbon. Provide a detailed arrow pushing mechanism that would account for this reaction.

(Bonus Question: Sunday "Miss Georgia" was crowned "Miss America" 2016. Were I a judge I would have voted the one seven finalist who said she hoped to one day become a professor of organic chemistry. For whom would I have cast my vote? (2 pts)

(a) Miss California
(b) Miss New Jersey
(c) Miss Tennessee
(d) Miss Texas
(e) Miss Love Canal