CHEM 310 Exam 2

Dr. Hanna

March 7, 2007

Honor Pledge:

In Part V of the Winthrop University Student Conduct Code, it is stated that "A fundamental tenet of all institutions of higher learning is academic honesty. … Misrepresentation of someone else's work as one's own is a most serious offense in any academic setting. … Academic misconduct includes but is not limited to providing or receiving assistance in a manner not authorized by the professor in the creation of work to be submitted for academic evaluation including papers, projects, and examinations …"

By my signature below, I pledge that I did not commit academic misconduct (cheat) on this examination.

_____ _____

Printed Name Signature

Part 1 _____/15

Part 2 _____/15

Part 3 _____/20

Part 4 _____/20

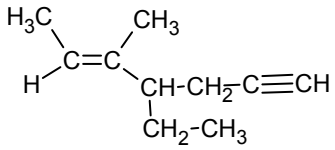
Part 5 _____/15

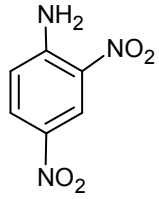
Part 6 _____/15

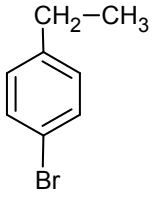
Total _____/100

Part 1: Nomenclature (15 pts)

1a. Write IUPAC names for the following compounds (indicate stereochemistry where required):

i) 

ii) 

iii) 

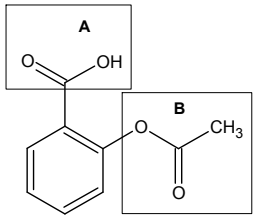
1b. Draw structures corresponding to the following IUPAC names:

i) *meso*-3,4-Dichlorohexane

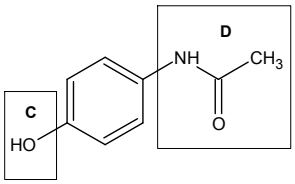
ii) *m*-Fluorotoluene

Part 2: Functional Group Identification (15 pts)

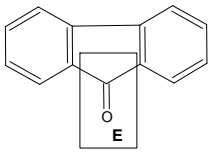
Identify the functional groups present in the following compounds:



Acetylsalicylic acid (Aspirin)



Acetaminophen



Fluorenone

A = _____

B = _____

C = _____

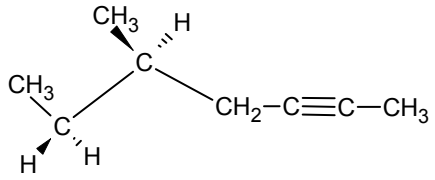
D = _____

E = _____

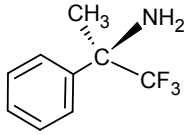
Part 3: Stereochemistry (20 pts)

3a. Identify the asymmetric centers in the following molecules and indicate the absolute configuration ((R)- or (S)-) of each asymmetric center:

i)

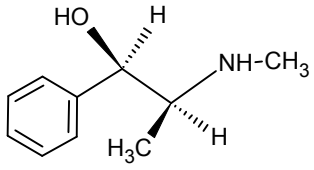


ii)

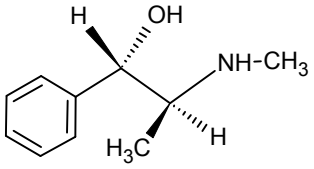


3b. Indicate the stereochemical relationship (enantiomers, diastereomers, or identical) of the following pairs of compounds:

i)



and



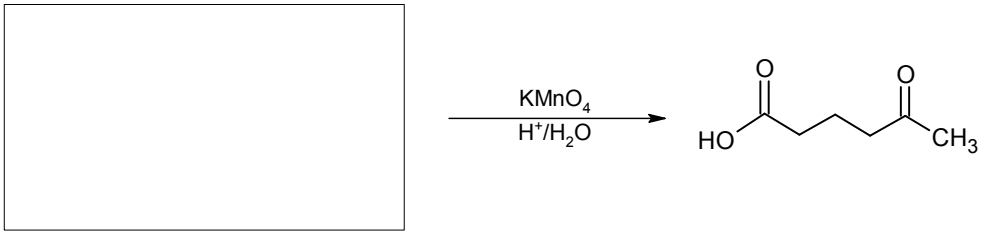
ii) (2S, 4R)-dichlorohexane and (2R, 4S)-dichlorohexane

3c. Draw a three-dimensional representation of (S)-3-methylpent-1-ene.

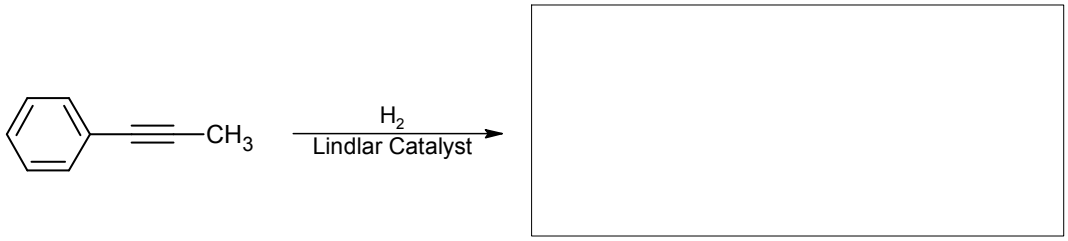
Part 4: Provide the Starting Material, Reagent, or Product (20 pts):

Provide the missing piece (starting material, reagent(s), or product(s)) in the box provided.

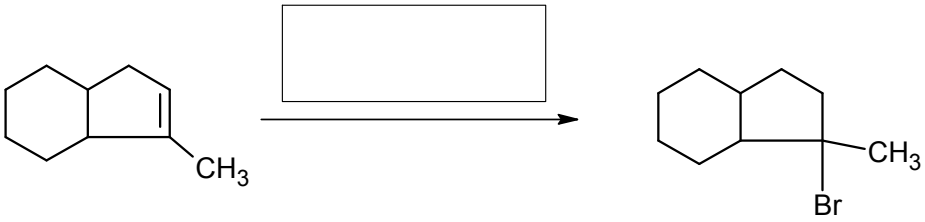
4a.



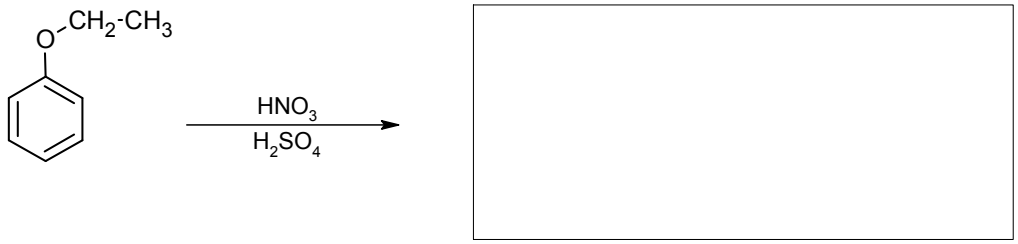
4b.



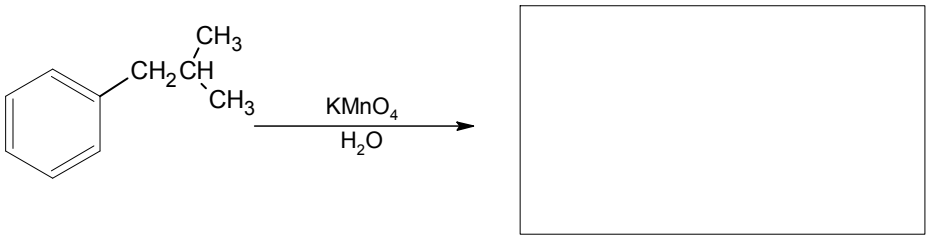
4c.



4d.

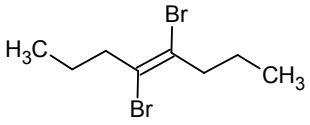


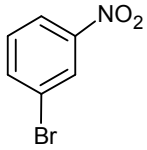
4e.

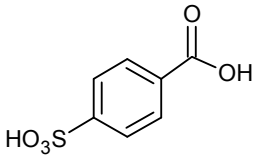


Part 5: Synthesis (15 pts)

Provide a synthesis of each of the following compounds starting from <u>benzene</u> ( ) and/or <u>acetylene</u> (HC≡CH), and any other inorganic reagents or alkyl halides needed. Assume ortho- and para- isomers of disubstituted benzenes can be separated.

5a. 

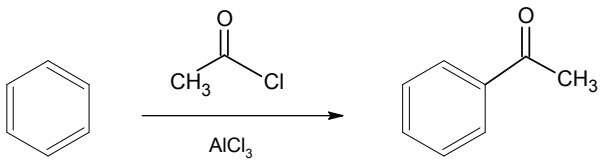
5b. 

5c. 

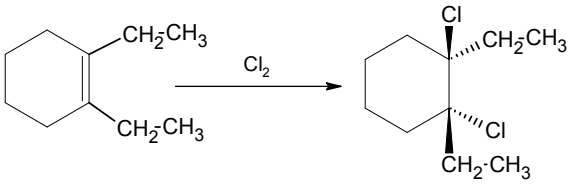
Part 6: Mechanisms (15 pts)

Provide complete arrow-pushing mechanisms for the following transformations:

6a.



6b.



6c.