

Third Exam

Chemistry 3331

November 20, 2015

Name: _____

Signature: _____

ID# _____

PLEASE CIRCLE CLASS TIME!

10:00 AM

1:00 PM

Page #	Score	
1. 15 pt		
2. 24 pt		
3. 18 pt		
4. 18 pt		
5. 13 pt		
6. 12 pt		

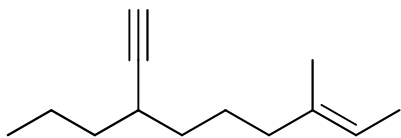
Total: _____

NOTE: Present your ID when you return the exam booklet.

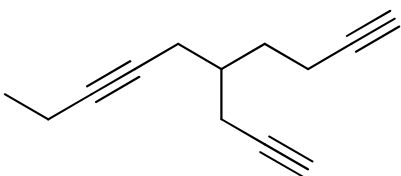
A. Nomenclature: (15 points)

Given an acceptable IUPAC name for each of the compounds. Be sure to indicate the **stereochemistry** where appropriate.

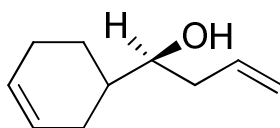
1.



2.

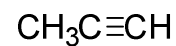
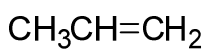
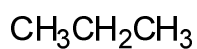


3.

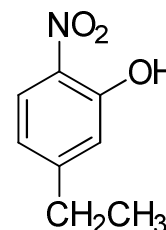
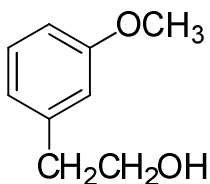
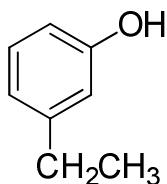


B. Facts: Total = 24 points

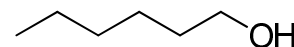
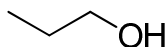
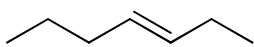
1. Place the compounds in order of increasing reaction rate with H_3O^+ . (1=slowest rate, 3=fastest rate) (6 points)



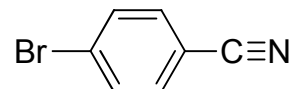
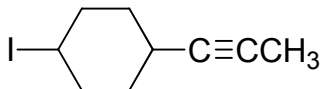
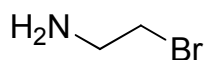
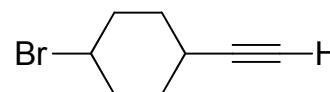
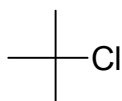
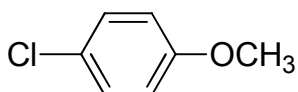
2. Place the alcohols in order of increasing acidity. (1=least acidic, 3=most acidic) (6 points)



3. Place the compounds in order of increasing solubility in hexane. (1=least soluble, 3=most soluble) (6 points)



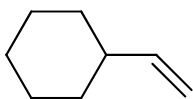
4. Place a "Y" in the box below any halide that will produce a useful Grignard reagent. Place an "N" in the box below any that will not. (6 points)



C. Reactions: Total = 36 points, 6 points each

Please provide the major product in the answer box. Be sure your drawing indicates stereochemistry if applicable. Partial credit is awarded only when intermediate products in a multi-step reaction are shown below in the reaction.

1.

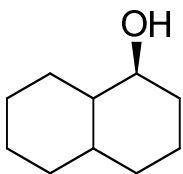


1. cold KMnO_4

2. NaOCl



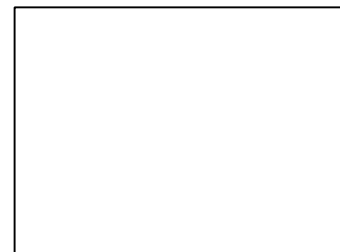
2.



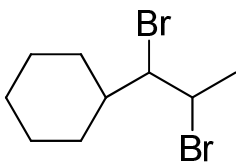
1. H_2SO_4 / Heat

2. KMnO_4 (warm, conc.)

3. NaBH_4 / EtOH



3.



1. NaNH_2 / $150\text{ }^\circ\text{C}$

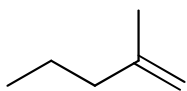
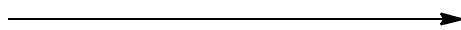
2. $\text{CH}_3\text{CH}_2\text{Br}$

3. Li / NH_3

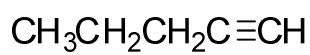

4. MCPBA



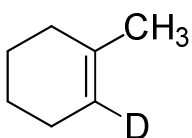
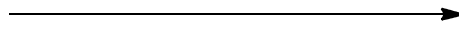
4.

1. BH_3 THF2. $\text{H}_2\text{O}_2 / \text{OH}^-$ 3. PCC/ CH_2Cl_2 4. $\text{CH}_3\text{C}\equiv\text{C}^- \text{Na}^+$, then H_3O^+ 

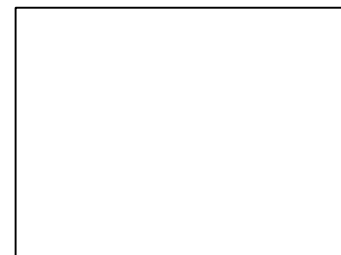
5.

1. $\text{H}_2\text{SO}_4 / \text{H}_2\text{O} / \text{HgSO}_4$ 2. -MgBr then H_3O^+ 3. HCl / ether / 0°C 

6.

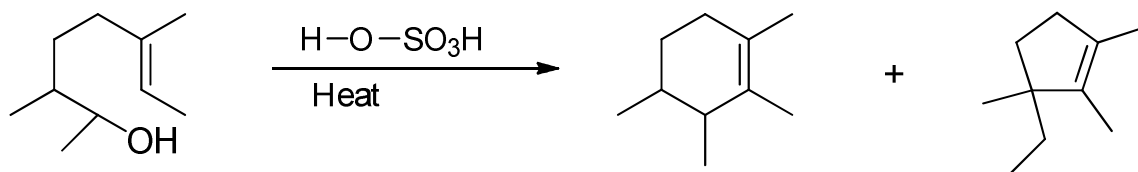
1. $\text{Hg}(\text{OAc})_2 / \text{H}_2\text{O}$ 2. NaBH_4 

3. TsCl / pyridine

4. NaCN / CH_3CN 

D. Mechanism: (13 points)

The reaction below produces a mixture of products. Provide a clear mechanism to explain the formation of the products shown. Use curved arrows to indicate “electron flow”. Remember to show only one step at a time. **Show all intermediates and all formal charges. Do not show transition states.**



E. Synthesis: (12 points)

Synthesize the molecule below from cyclohexanol and alkanes or alcohols of **two** carbons or less, any oxidizing or reducing agents, and any other inorganic reagents. (Please do not include mechanisms.)

