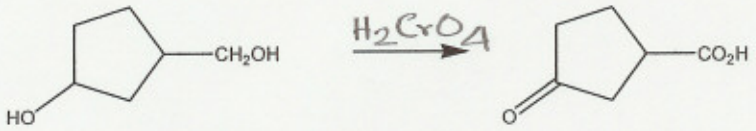
Lecture Exam1, Chem12C, Summer 2005, Foothill College

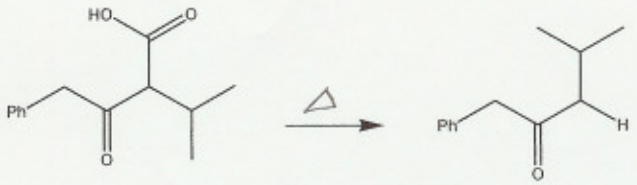
Name KEY

1. Show the reagents and/or experimental conditions necessary to bring about each conversion in good yield: (3 points each; 24 points)

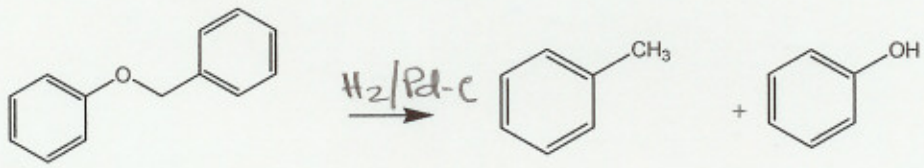
a)



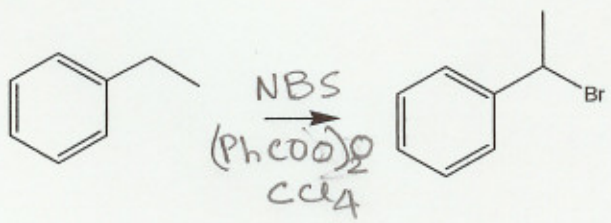
b)



c)



d)



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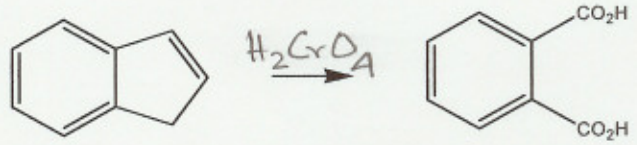

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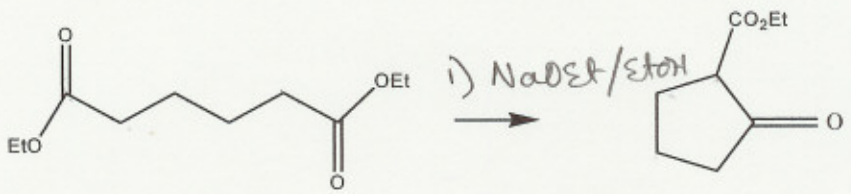
g)



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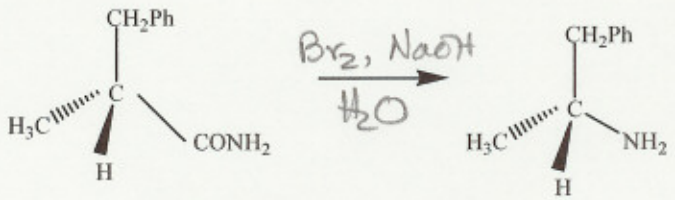
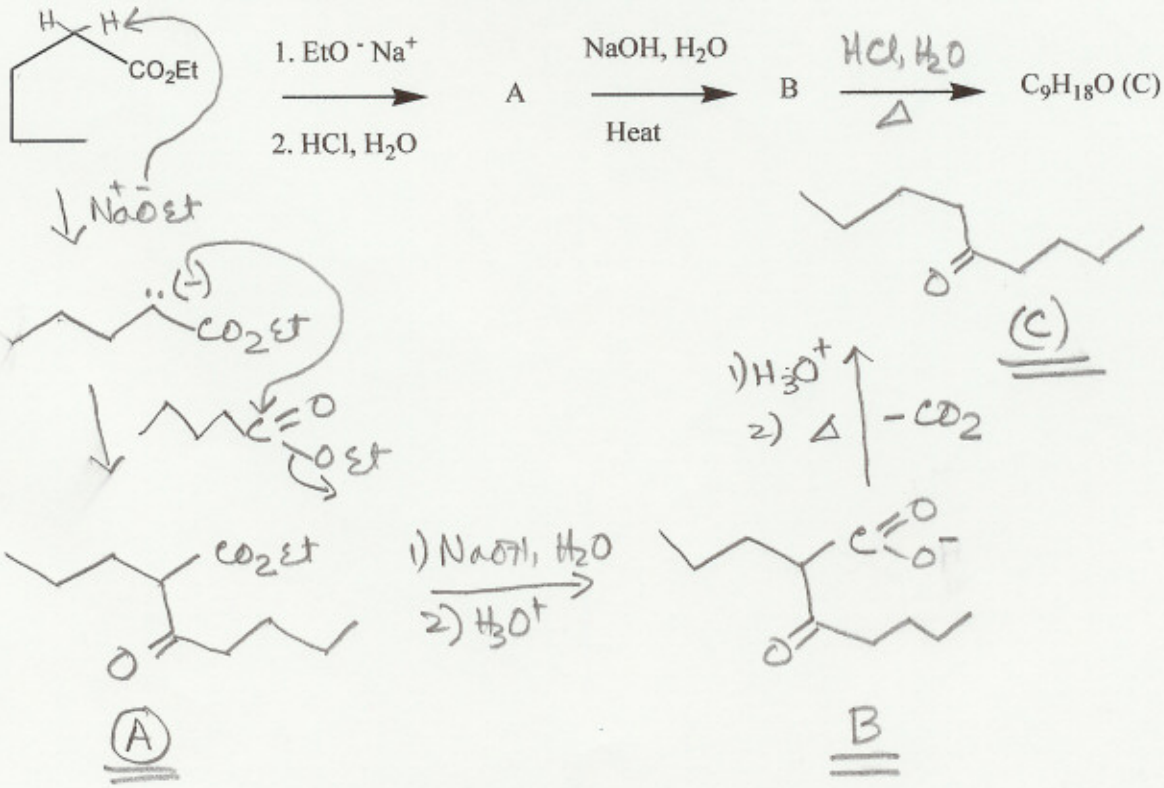


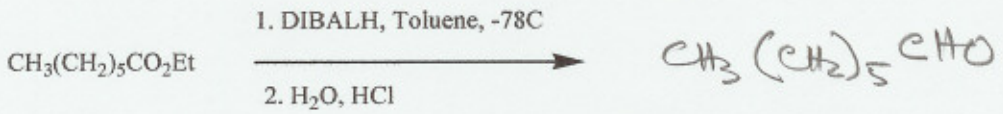
Hoffman Rearrangement

2. Show structural formulas of the compounds A & B and the ketone (C) formed in the following sequence of reactions (4 points each; 12 points):



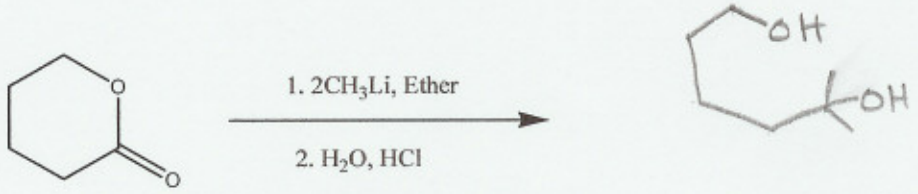
3. Show the structure(s) of missing product(s): (12 points)

a)

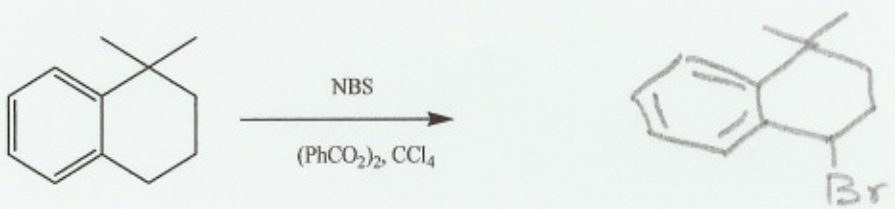


b)

c)



d)

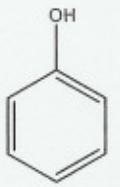


4. Decide the relative acid strength of the choices in each list, and then write 1 under the strongest acid, 2 under the weaker acid and 3 under the weakest acid (3 points each; 12)

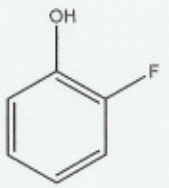
a)

PhOH	HCO_3^-	H_2O
1	2	3

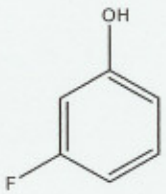
b)



3



1



2

c)

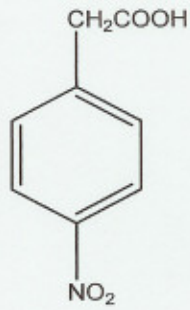
CH_3COOH 2

CH_3OCH_2COOH 3

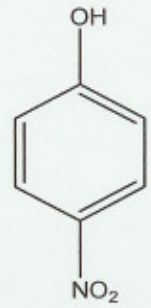
O_2NCH_2COOH 1

d)

1



2



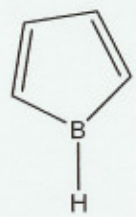
3

5. Indicate which compound is aromatic and which is non-aromatic by writing 'aromatic' or 'non-aromatic' on the lines under their structures: (3 points each; 12 points)

Non-Aromatic

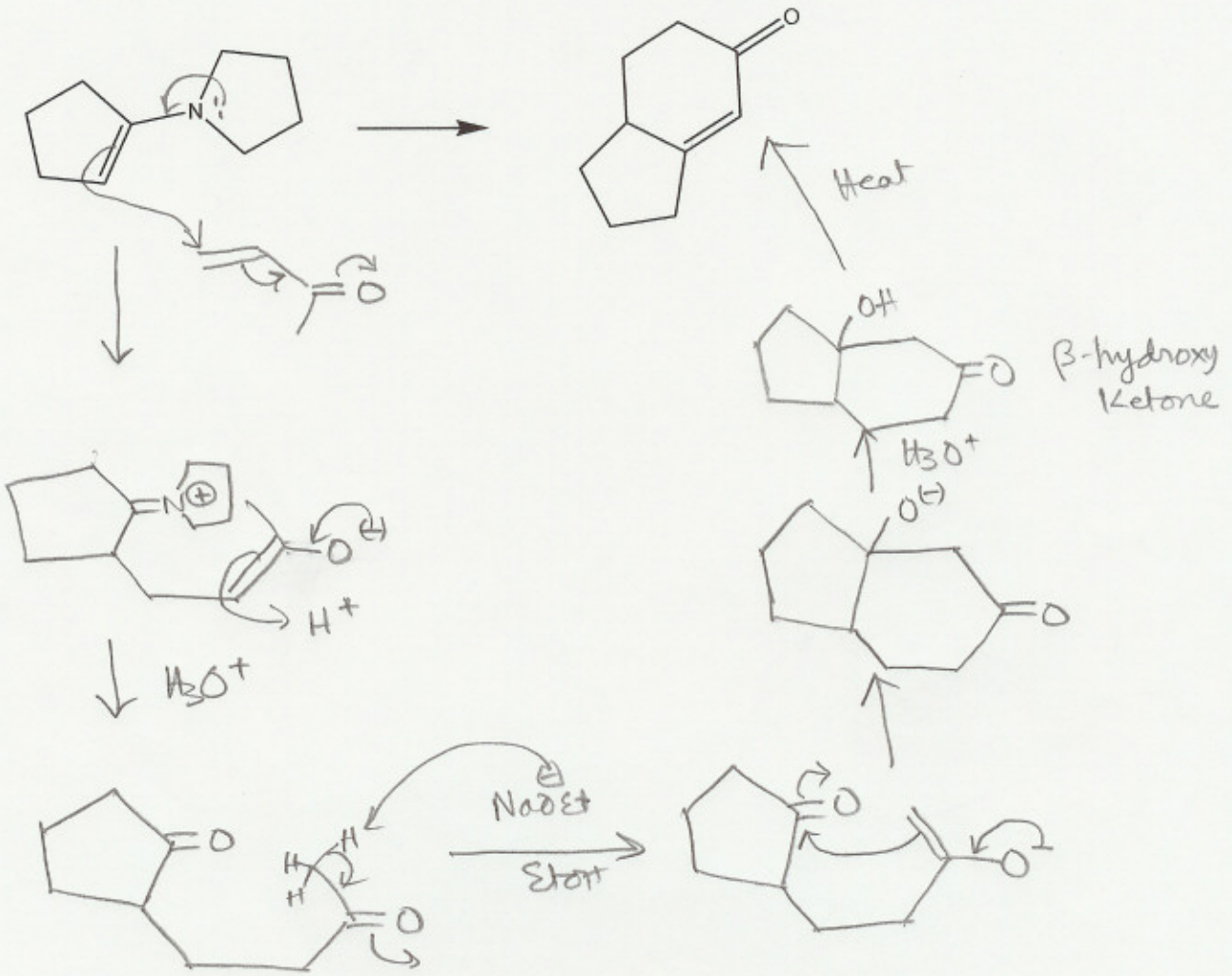
Non-Aromatic

Aromatic



Non-aromatic

c)

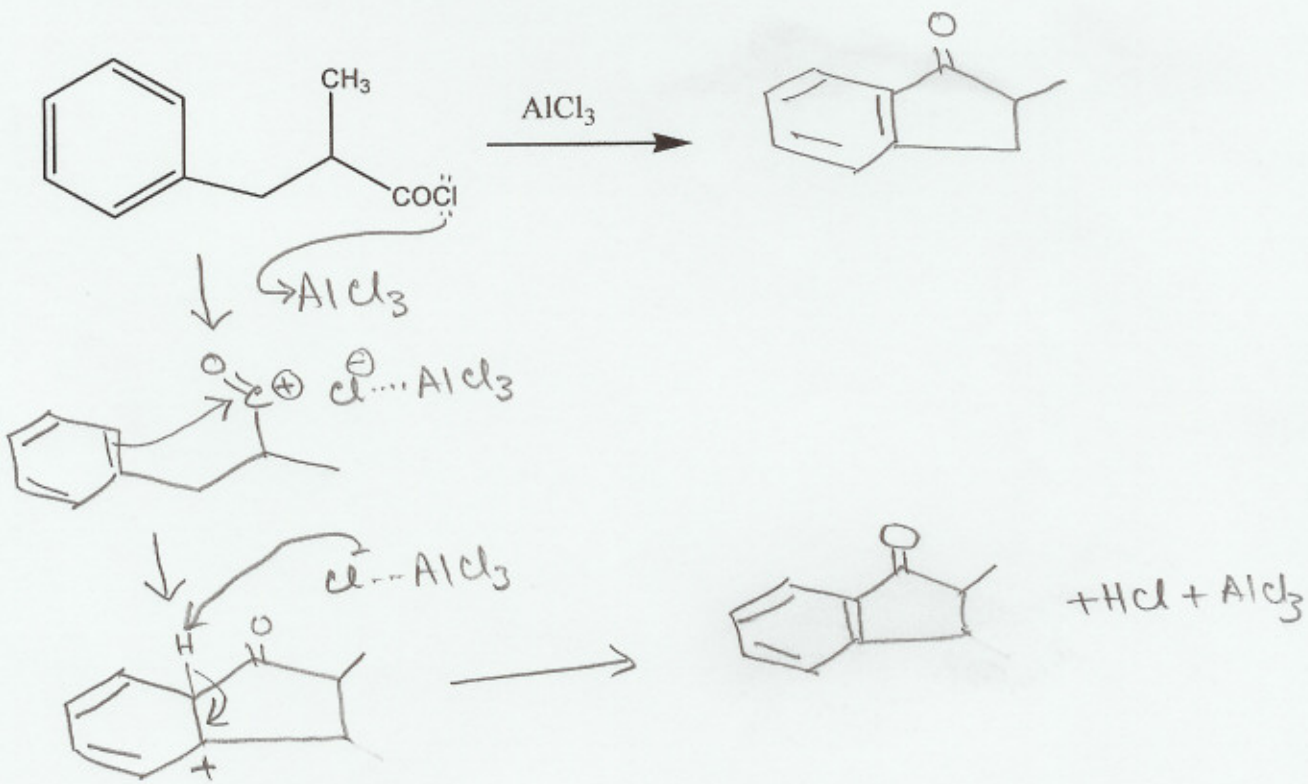


6. Dipole moment of naphthalene is 0.0 while that of azulene is 1.0. Explain the difference (4 points).

Napthalene is symmetric Aromatic compd., so it has ϕ dipolemoment.

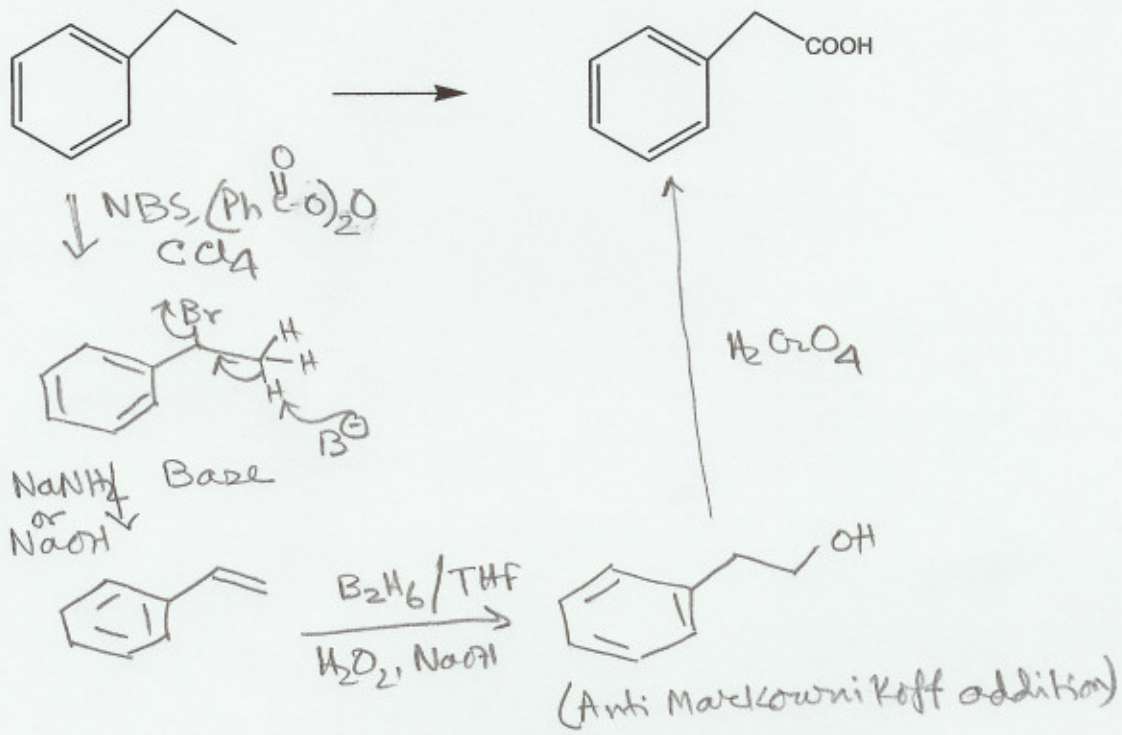
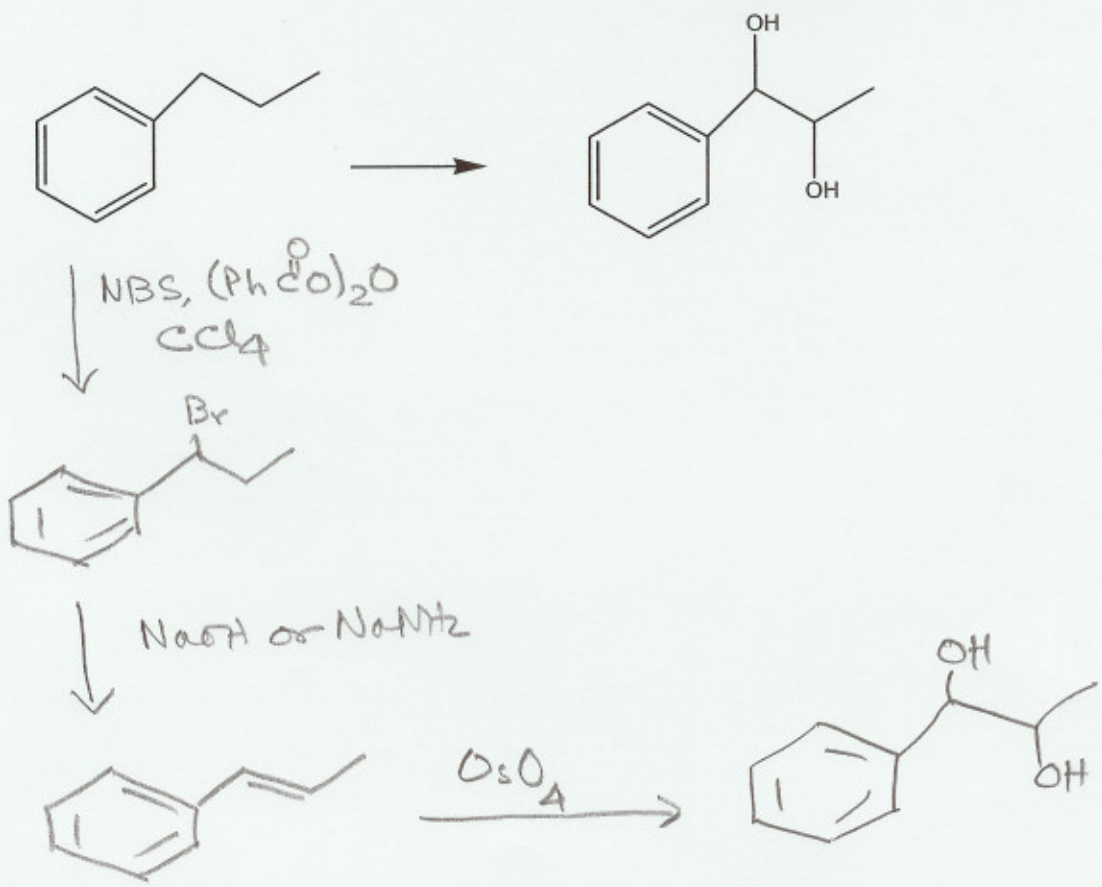
Azulene has resonance structures (A) & (B). B has both a cyclopentyl anion, which is 6-membered aromatic and a tropylium cation which is a seven membered aromatic ring. Because (B) is aromatic, it has big contribution. The charge separation brings about large polarity

7. Write the structure of the product and propose a mechanism for the reaction using curved arrow formalism. Include all lone pair electrons, formal charges and proton transfer steps, if any is involved. (6 points)



8. Using the starting material shown and using any other organic or inorganic reagent you need, show how you would synthesize the target compound in good yield: (6 points each; 18 points)

a)



b)