1								

1	0	0	0	0	0	0	0	0
	1	1	1	1	1	1	1	1
	2	2	2	2	2	2	2	2
	3	3	3	3	3	3	3	3
	4	4	4	4	4	4	4	4
	5	5	5	5	5	5	5	5
	6	6	6	6	6	6	6	6
	7	7	7	7	7	7	7	7
	8	8	8	8	8	8	8	8
	9	9	9	9	9	9	9	9

CEM 352 –Quiz 3

Spring 2025

NAME	

Score		

0	0	0
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9

READ THIS!

Bubble in your PID in the space above. Write your answer for each question in the space provided.

LEAVE THIS COVER SHEET ATTACHED TO THE Quiz!

1. 23 /23

2. 13 /13

3. 10 /13 → This is out of 10 points, but for those who presented a rational answer for problem 7 received 3 pts extra credit; otherwise, this problem was omitted

4. 04 /04

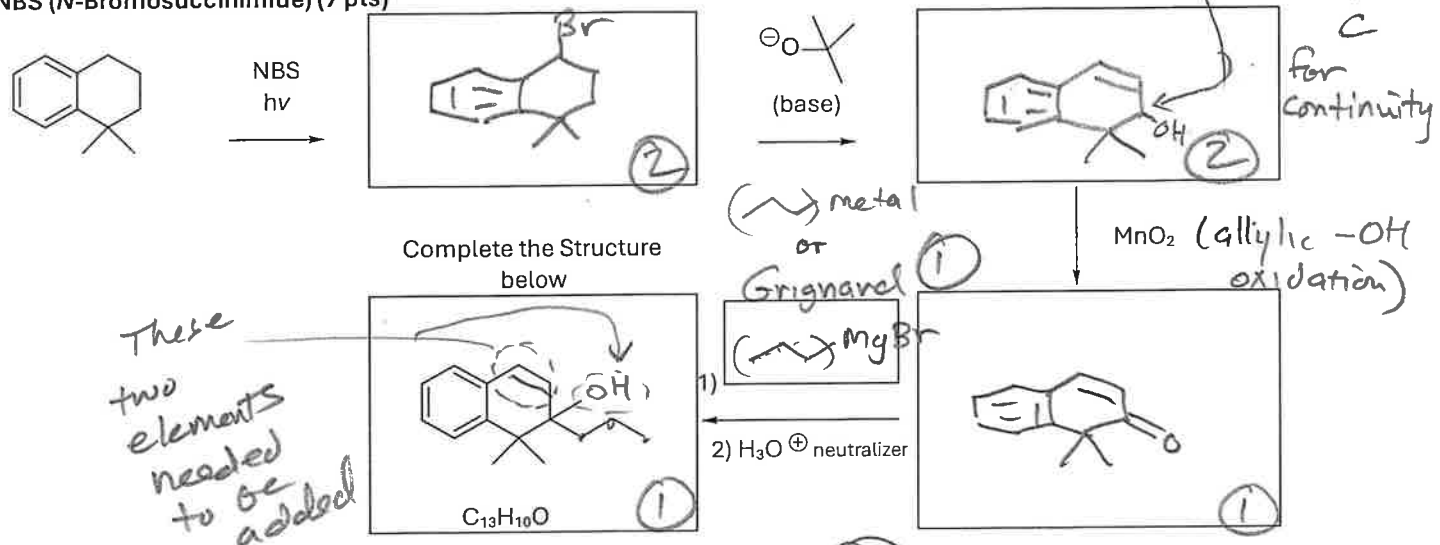
TOTAL: 50 /50 → your Quiz total is out of 50 pts; however, your score includes 3 pts extra if you received them for problem 7.

Avg: 30 High Score 53!, well done

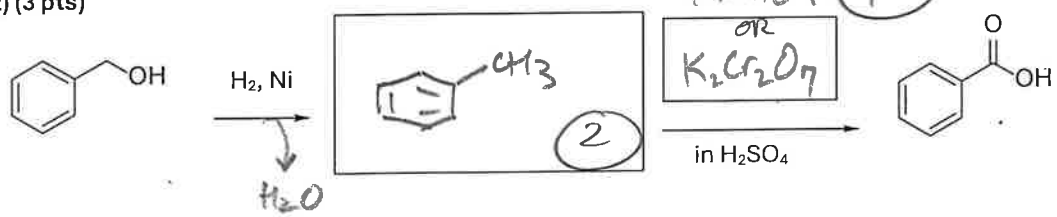
Students informed to "add" –OH at this C for continuity

Show the reaction products or intermediates in the large rectangles and the necessary reactants in the smaller rectangles.

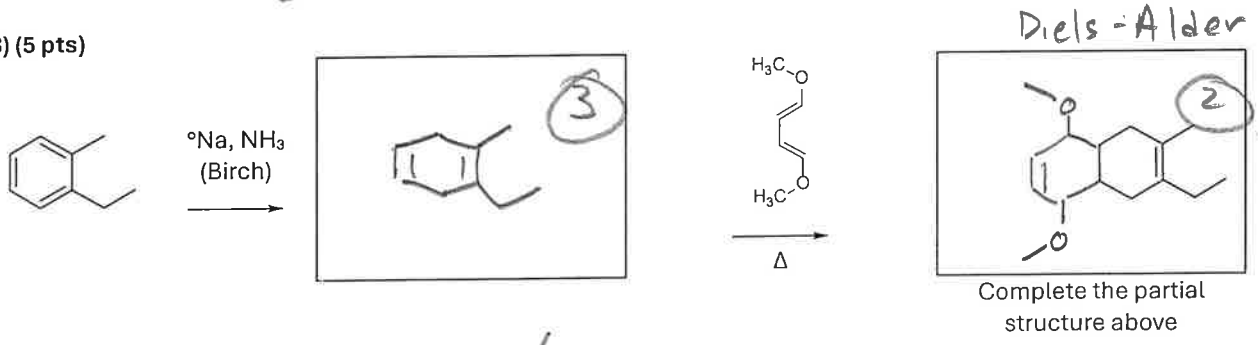
1) NBS (*N*-Bromosuccinimide) (7 pts)



2) (3 pts)

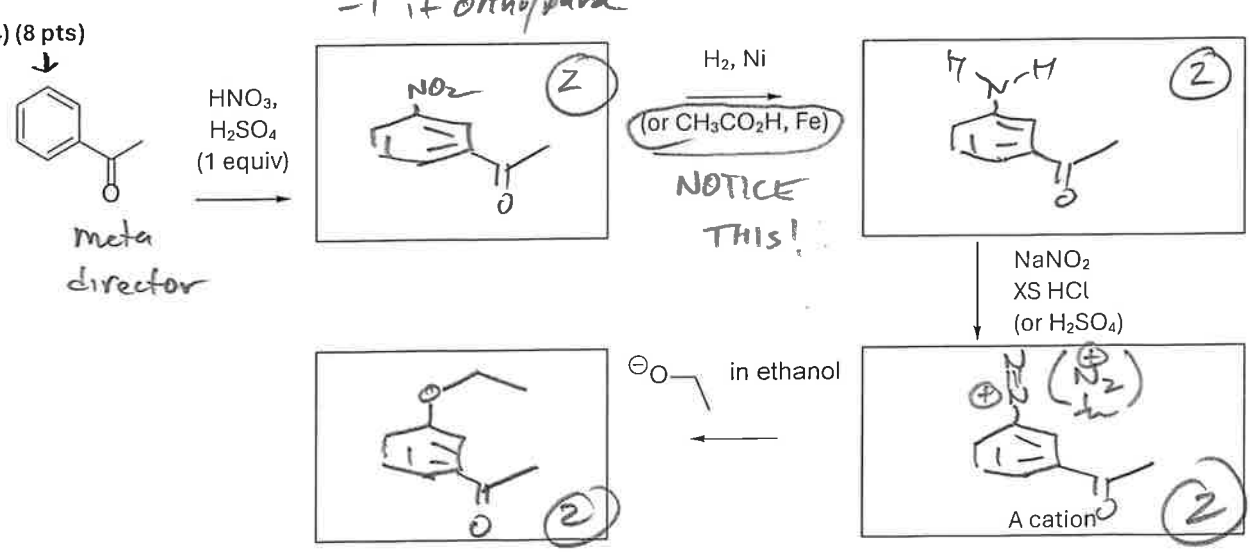


3) (5 pts)

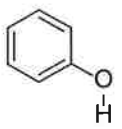


Complete the partial structure above

4) (8 pts)

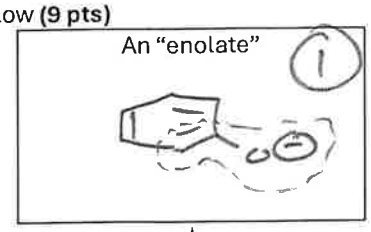


5) Complete the scheme below **(9 pts)**

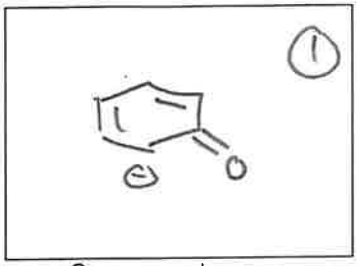


$HO^{\ominus}/H_2O$

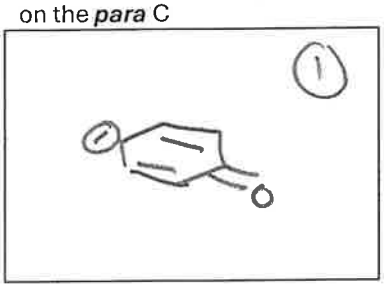
An "enolate"



AT RIGHT: Draw a resonance structure that has a (–) charge on an ***ortho*** C



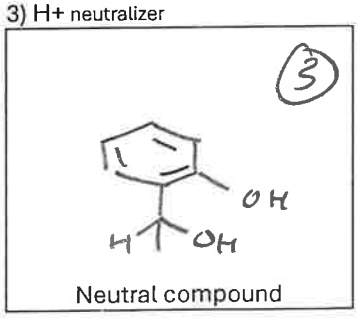
BELOW: Draw a resonance structure that has a (–) charge on the ***para*** C



1) 

2) **H-transfer to aromatic tautomer**

3) H+ neutralizer

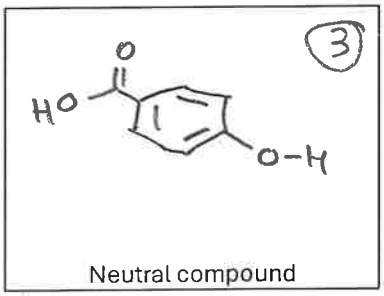


Neutral compound

1) O=C=O

2) **H-transfer to aromatic tautomer**

3) H+ neutralizer

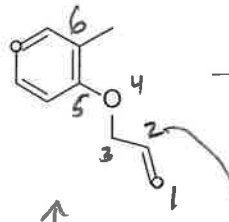


Neutral compound

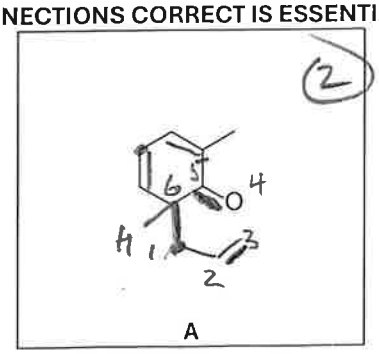
A side product made while doing a reaction next to a labmate who was cooling their reaction with dry ice (CO_2)

Show the following rearrangement products of the sequential Claisen-Cope reactions in the next two problems

6) (4 pts). GETTING THE CONNECTIONS CORRECT IS ESSENTIAL – use margins as workspace, if needed



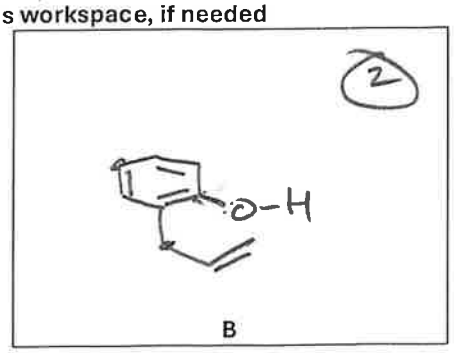
Δ



A

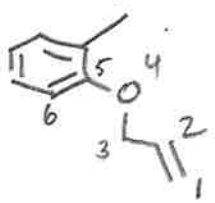
Complete the partial structure above

Tautomerization to the phenol

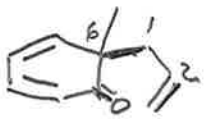


B

a Phenol



2

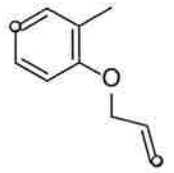


no tautomer to rearomatize ∴ go from this Res

a slightly more challenging problem from the Vollhardt textbook

7) The phenol on the previous page undergoes a **Cope rearrangement** to yield a product where a new bond is formed between the dotted carbons **(3 pts). GETTING THE CONNECTIONS CORRECT IS ESSENTIAL**

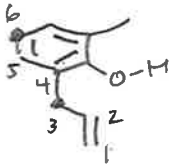
OMIT* (see notes)



Δ

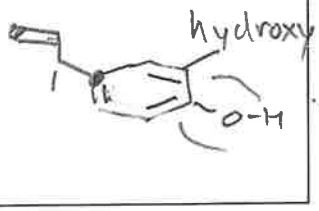
copy B here

A → (B) (from previous page)



Δ

OMITTED unless student entered a rational structr.



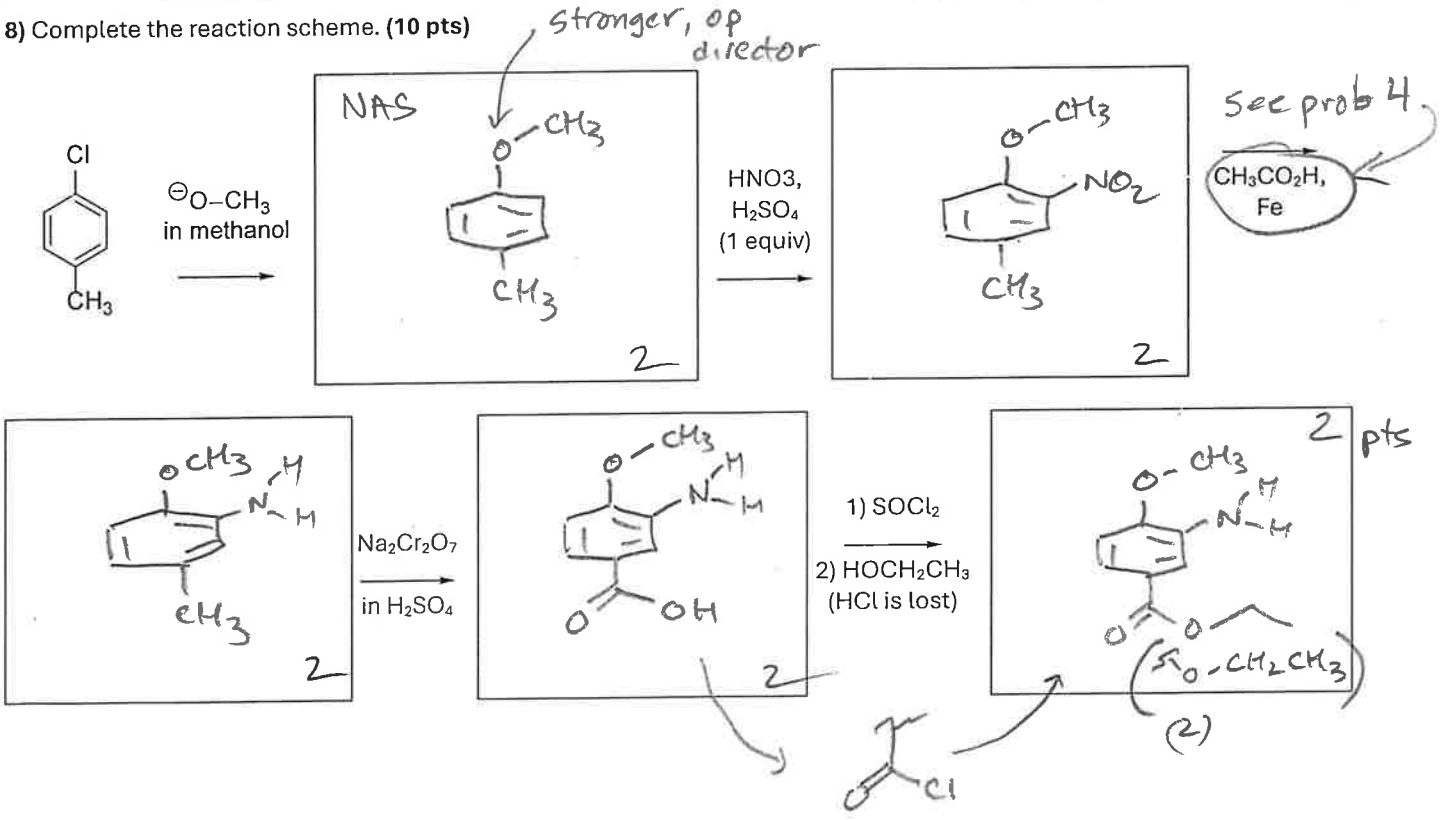
3pts

The dots were misplaced in the original structure, but for those who forged ahead with a rational sigmatropic rearr, got extra credit

(SEE BELOW)

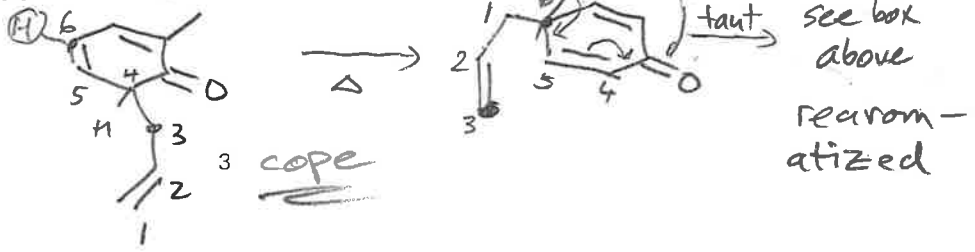
Disregarding dots(•); they were include to try and simplify the problem, but instead added confusion.

8) Complete the reaction scheme. **(10 pts)**



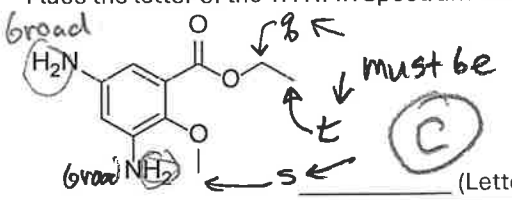
There should have been an ⇌ equilibrium arrow as a HINT, I tried to simplify this problem from the book, but was unable.

A ⇌ B B → A

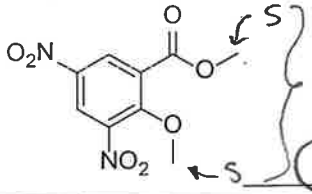


Look at C

Place the letter of the 1H NMR Spectrum that matches the compounds below. **(4 pts)**

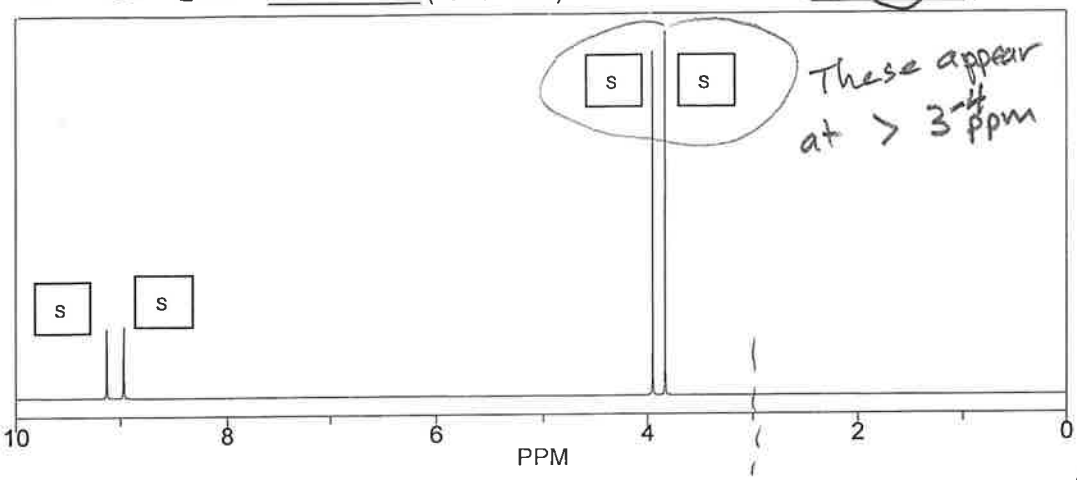


(Letter here)

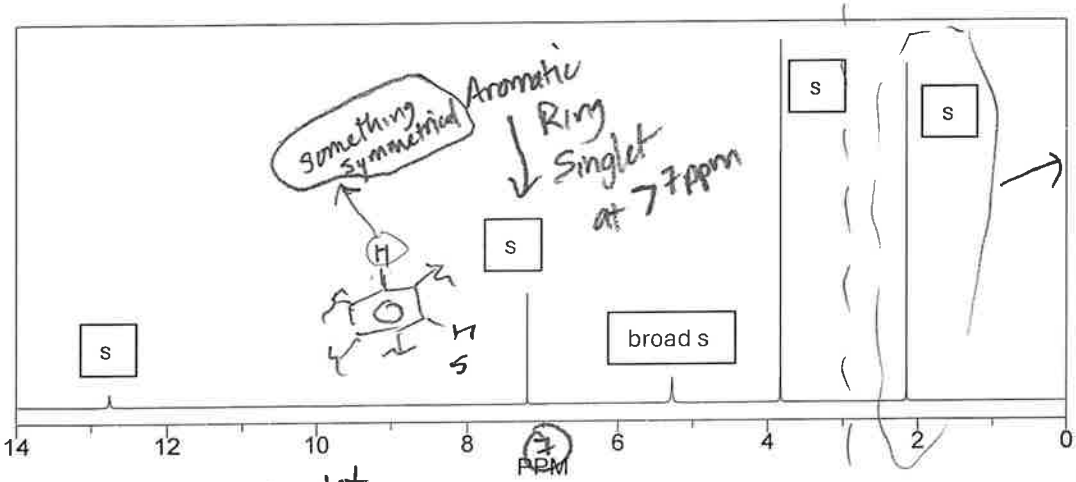


(Letter here)

based on observation from below these $-O-CH_3$ should be above 3 ppm!

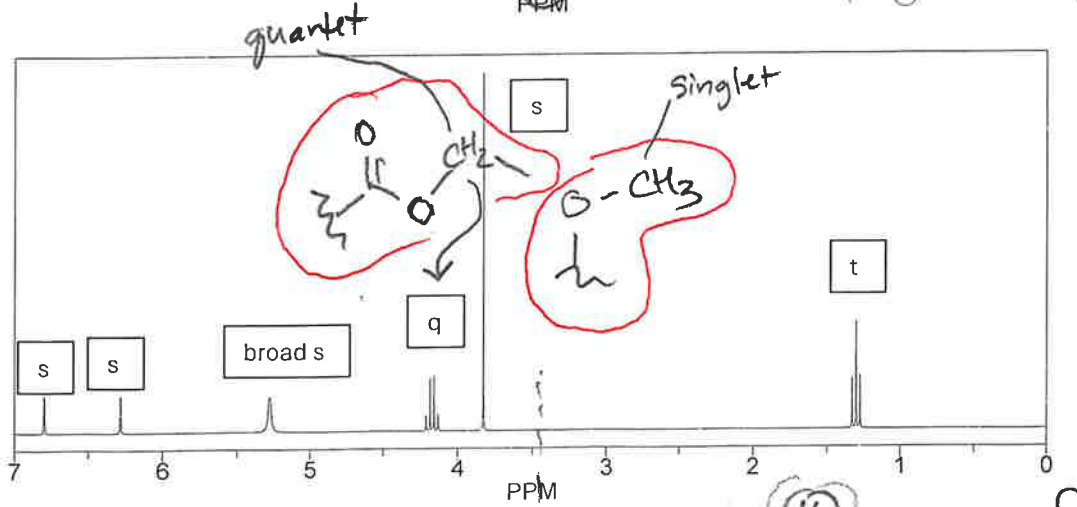


A

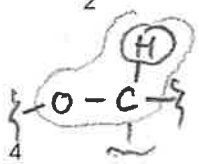


B

this H signal is < 3 ppm ∴ it does not belong to the other structure



C



> 3-4 ppm

the chemical shift of H-C attached to an O is > 3 ppm!

KEY DEDUCTIVE CONCEPT