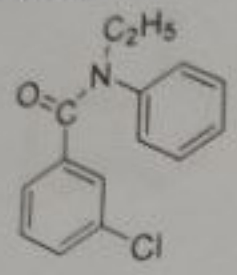
期 中 试卷（A）卷

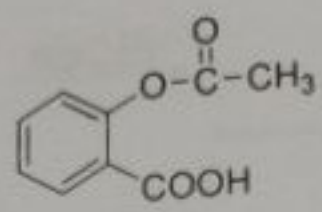
考试形式 闭卷

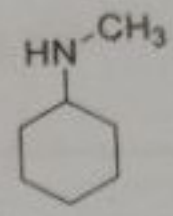
2019 年 4 月

专业 应用化学

Part 1. Give the CCS name or structural formula for each of the following compounds.（10 points）

1. 

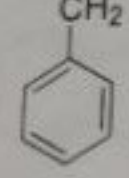
2. 

3. 

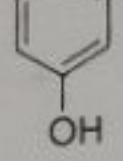
N-甲基环己胺

N,N-乙基苯基氨基间氨苯酰胺

乙酸邻苯甲酸甲酯

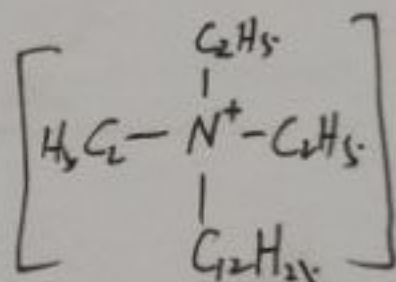
4. 

R-2-溴丙酸

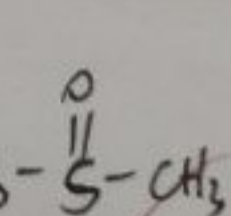
5. 

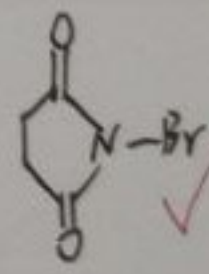
对羟基苯胺

6. 溴化十二烷基三乙基铵



7. LDA　　8. 碘化三甲基锍　　9. DMSO　　10. NBS





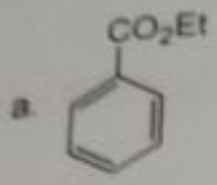
Part 2. Choose the most suitable key for each problem. Mark the corresponding letter in the bracket after each one.（10 points）

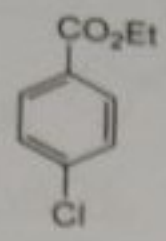
1. 脂肪的碱水解称为（ B ）

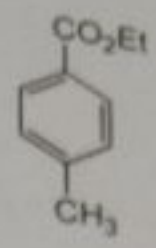
A. 酯化　B. 皂化　C. 还原　D. 水解

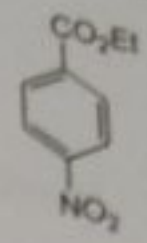
2. Rank the hydrolysis rate of the following esters under alkaline conditions in descending order.

(D)

a. 

b. 

c. 

d. 

A. a > b > c > d　　B. c > a > b > d

C. d > a > c > b　　D. d > b > a > c

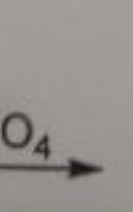
3. Which of the following name reaction is usually used to prepare 1,5-dicarbonyl compounds?

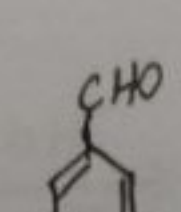
(D)

A.克莱门森反应　B. 威廉姆森反应　C. 狄克曼反应　D. 麦克尔加成

4. Which compound has the strongest basicity?

(A)

A. $(CH_3CH_2)_3N$　B. 

C. 

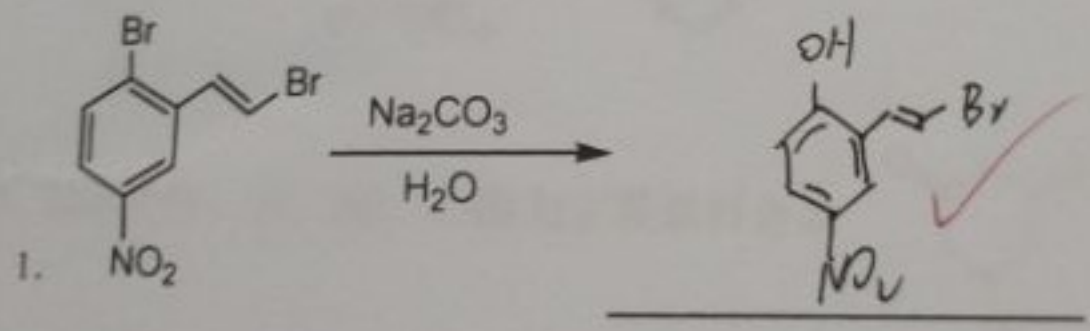
D. 

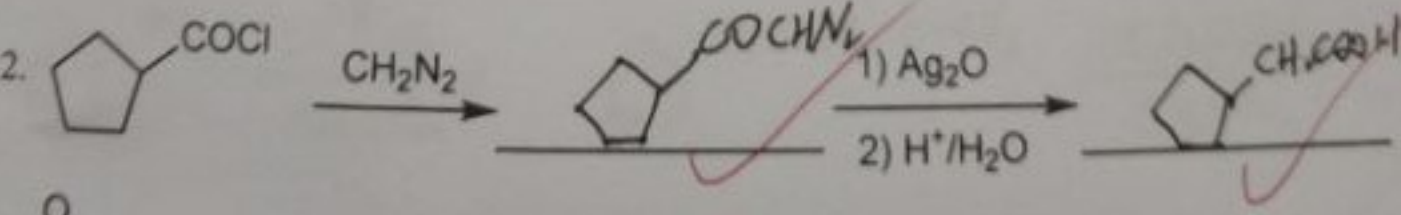
5. 酰胺的 Hoffmann 重排反应经过的主要活性中间体是

(D)

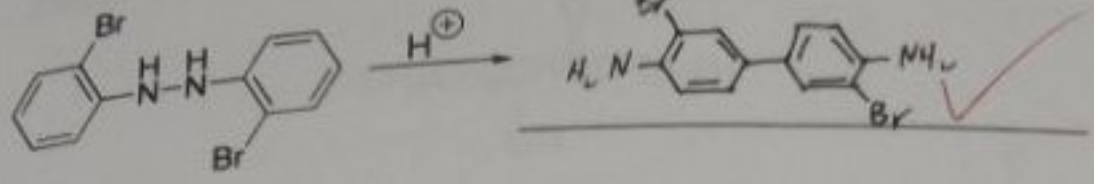
A. 碳正离子　B. 碳负离子　C. 碳烯　D. 氮烯

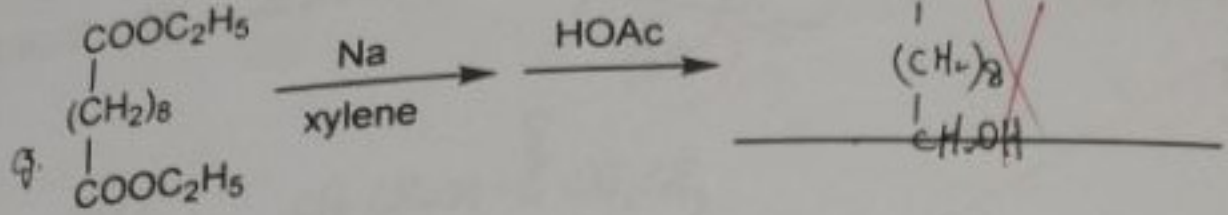
Part 3. Please complete the following reaction and write the structure of the major product（2'×10 = 20）:

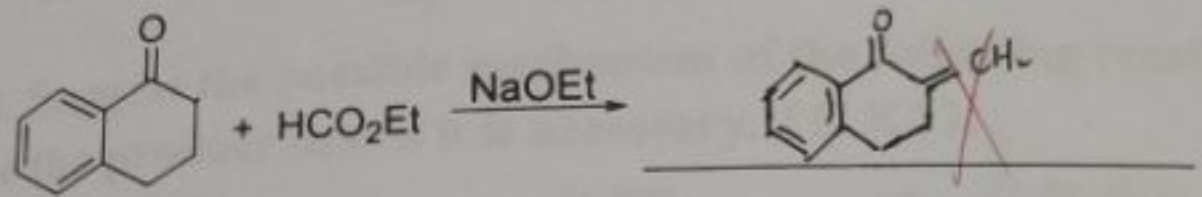
1. 

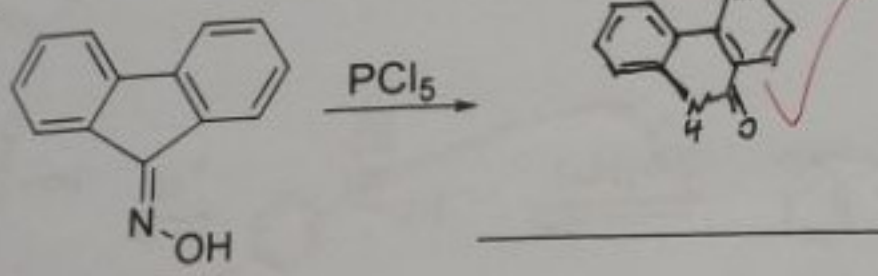
2. 

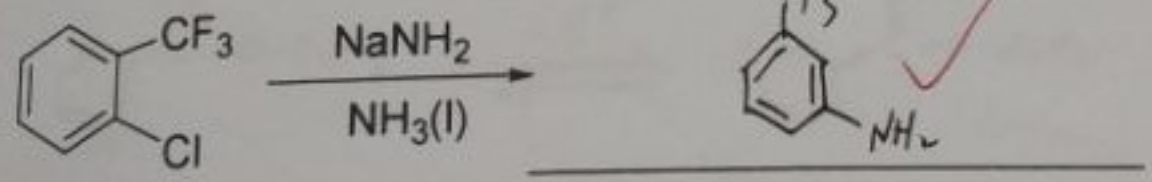
3.

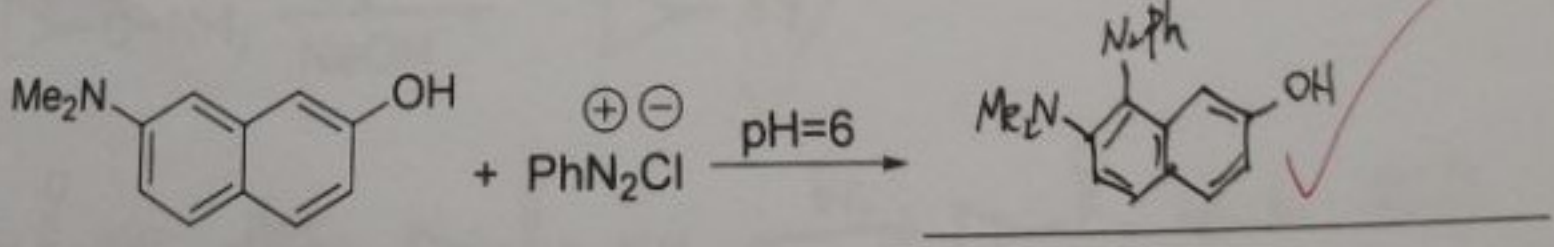
4. 

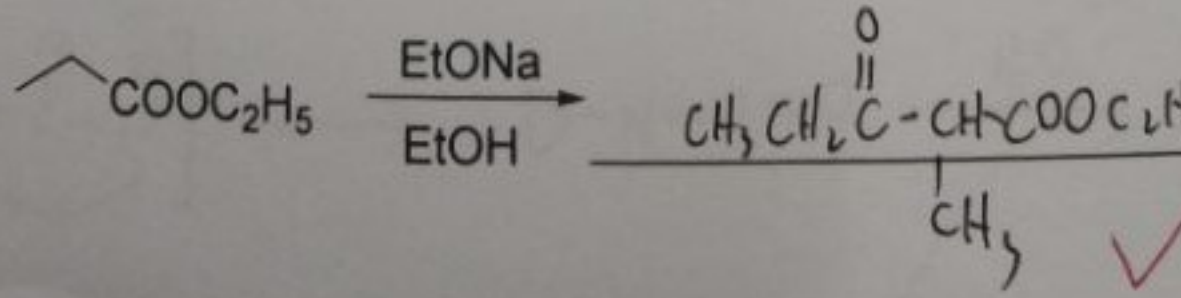
5. 

6. 

7. 

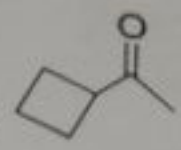
8. 

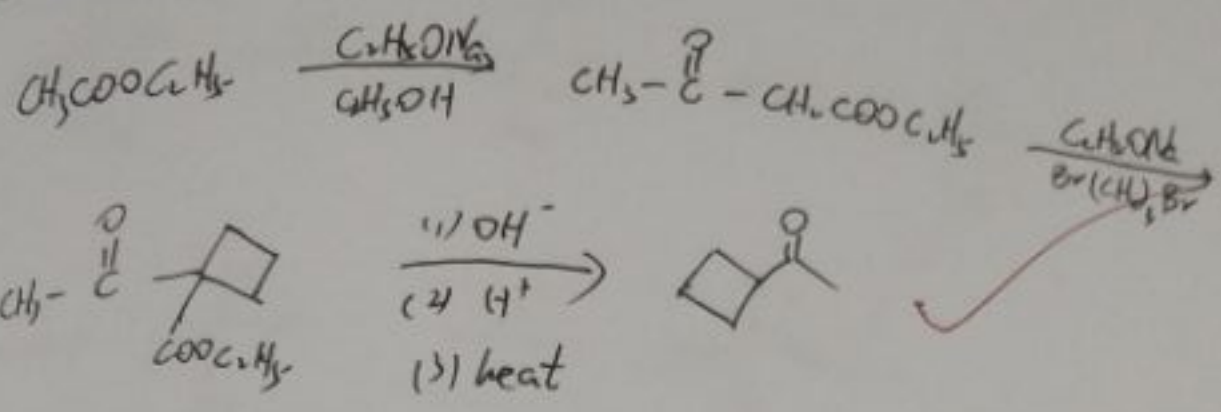
9. 

10. 

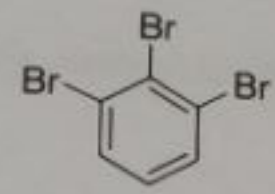
Part 4. Synthesis (5'×4 = 20):

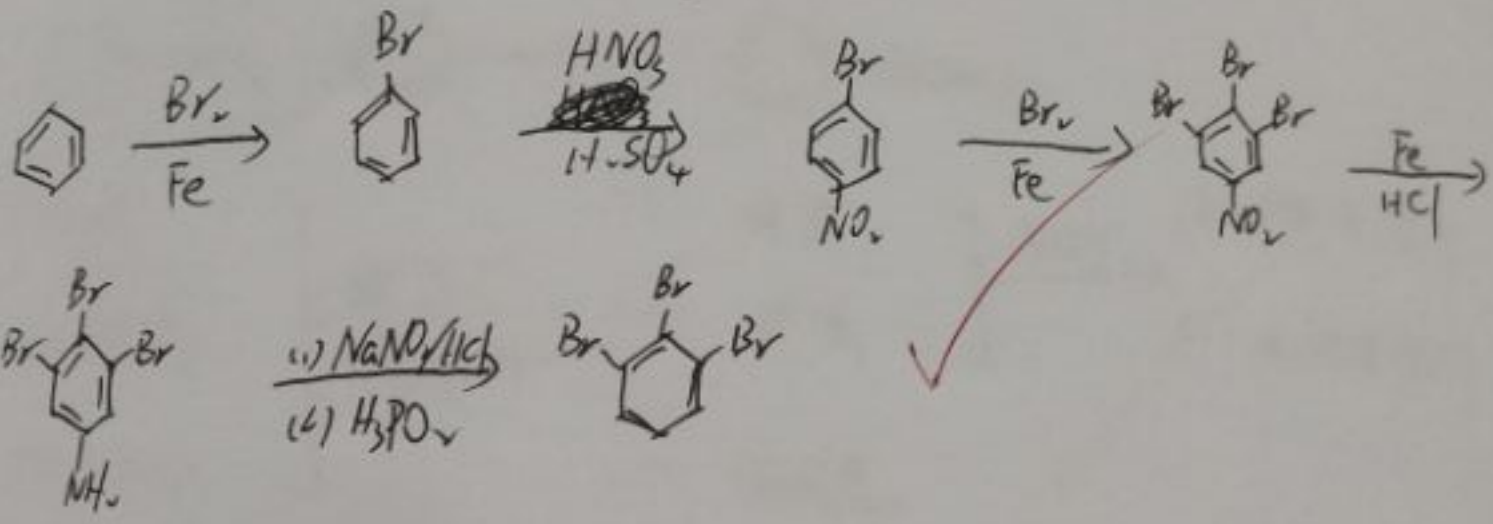
18

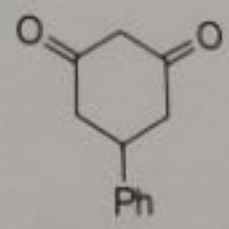
1. 由 $CH_3COOC_2H_5$ 合成 

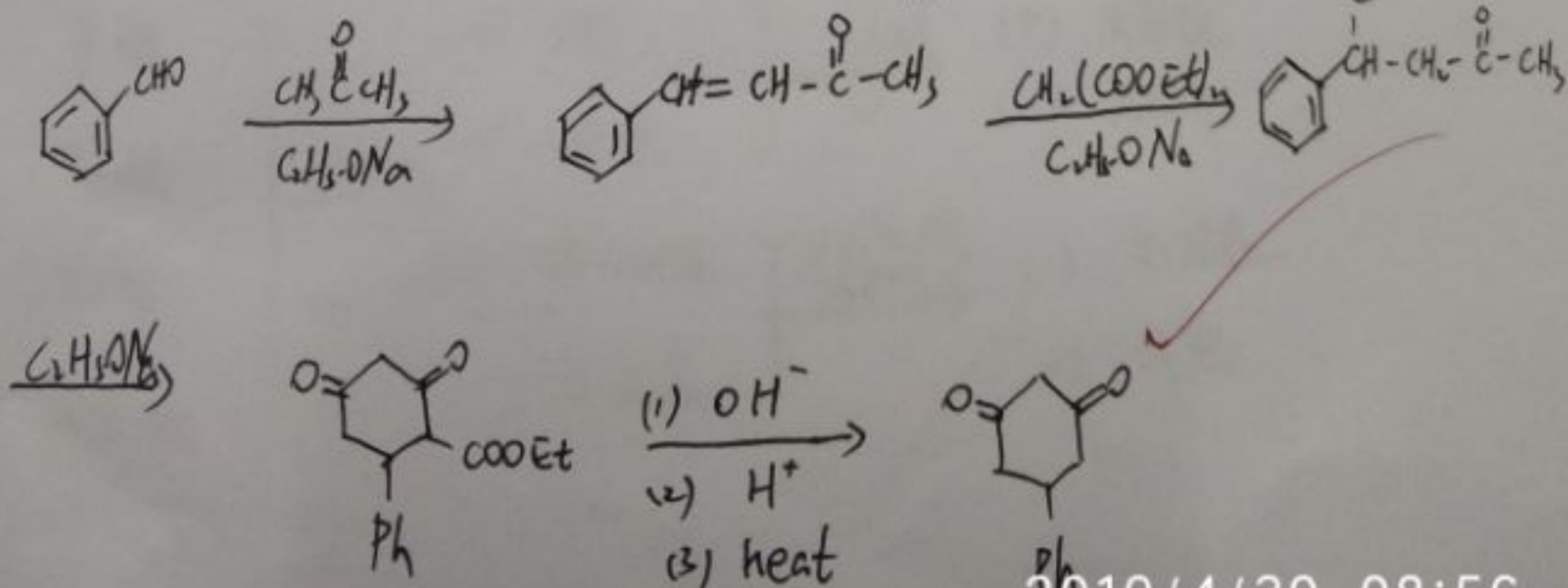


2. Preparation of the compound shown below using benzene as the starting materials.





3. 以苯甲醛、丙二酸二乙酯为主要原料合成 



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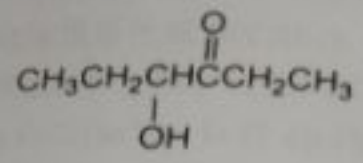
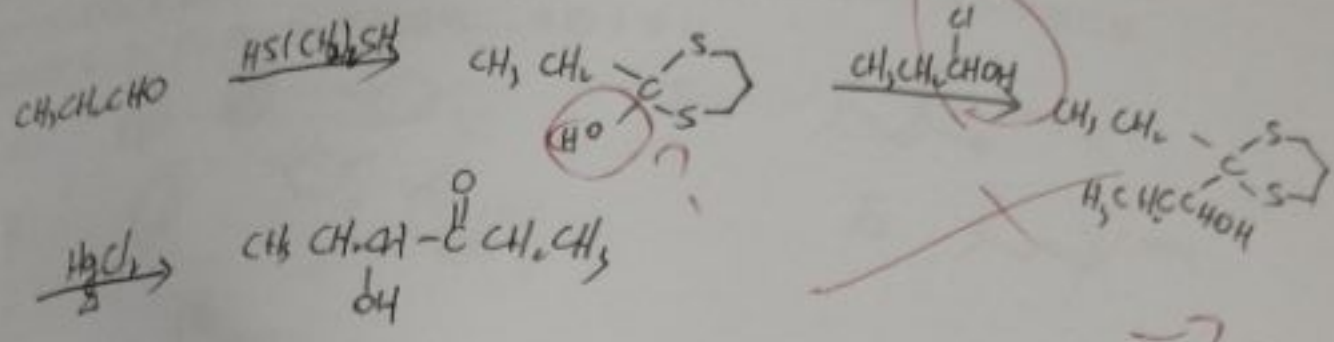
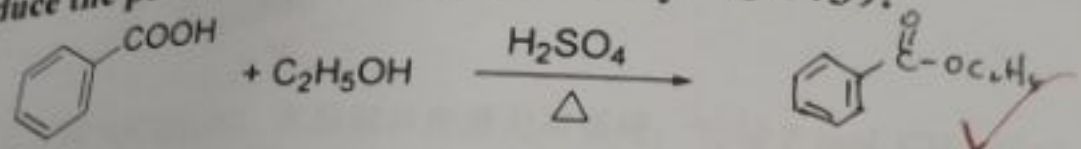
4. Please using S-containing compound to prepare:

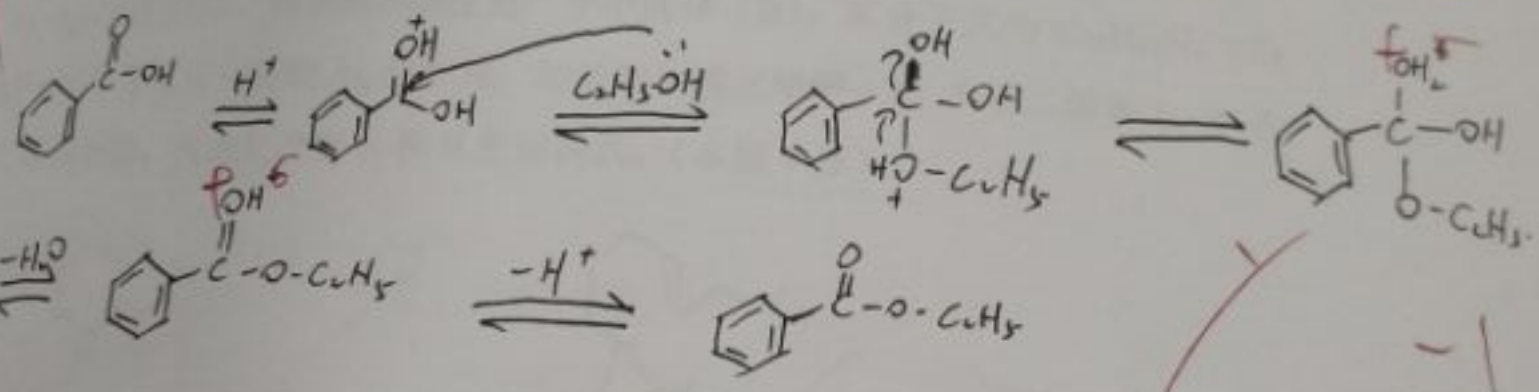




Part 5. Suggest the possible mechanism of the following reactions, deduce the product first if it is necessary. (5'×3):

1.





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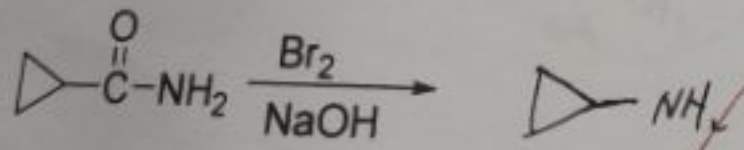
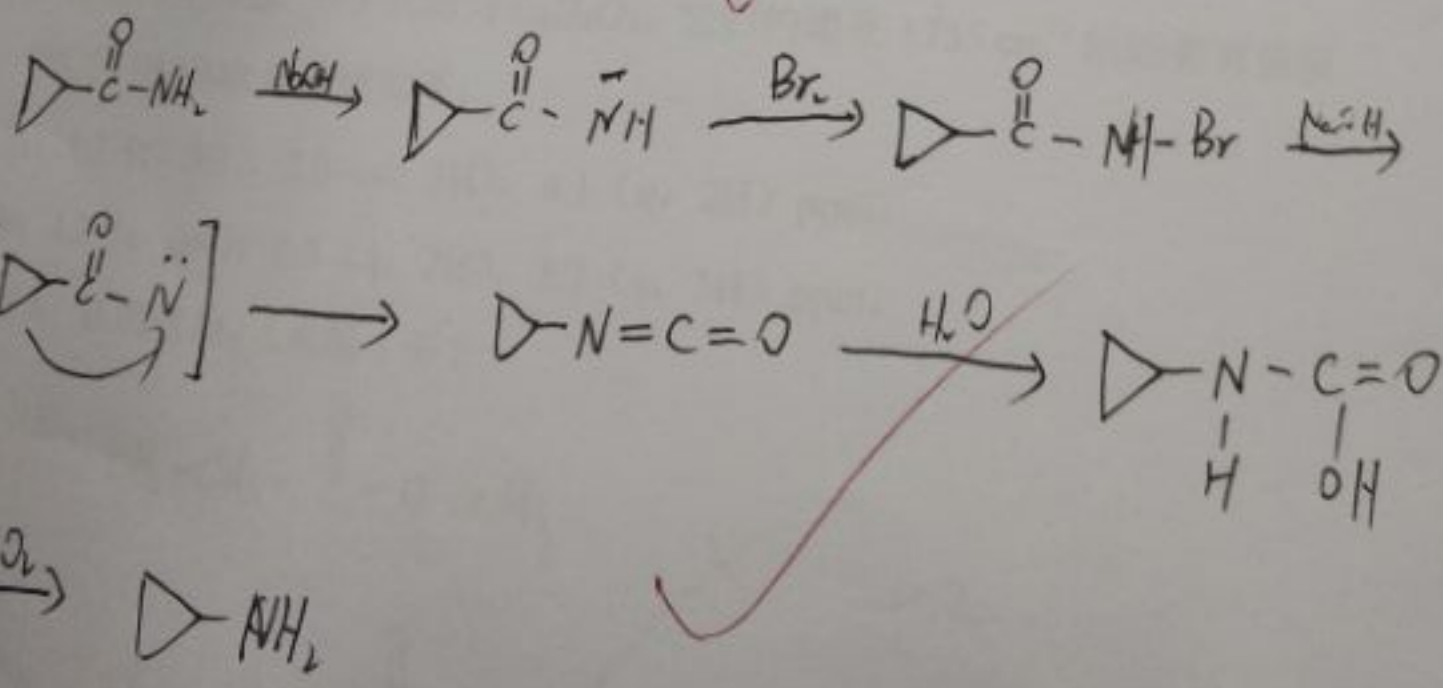
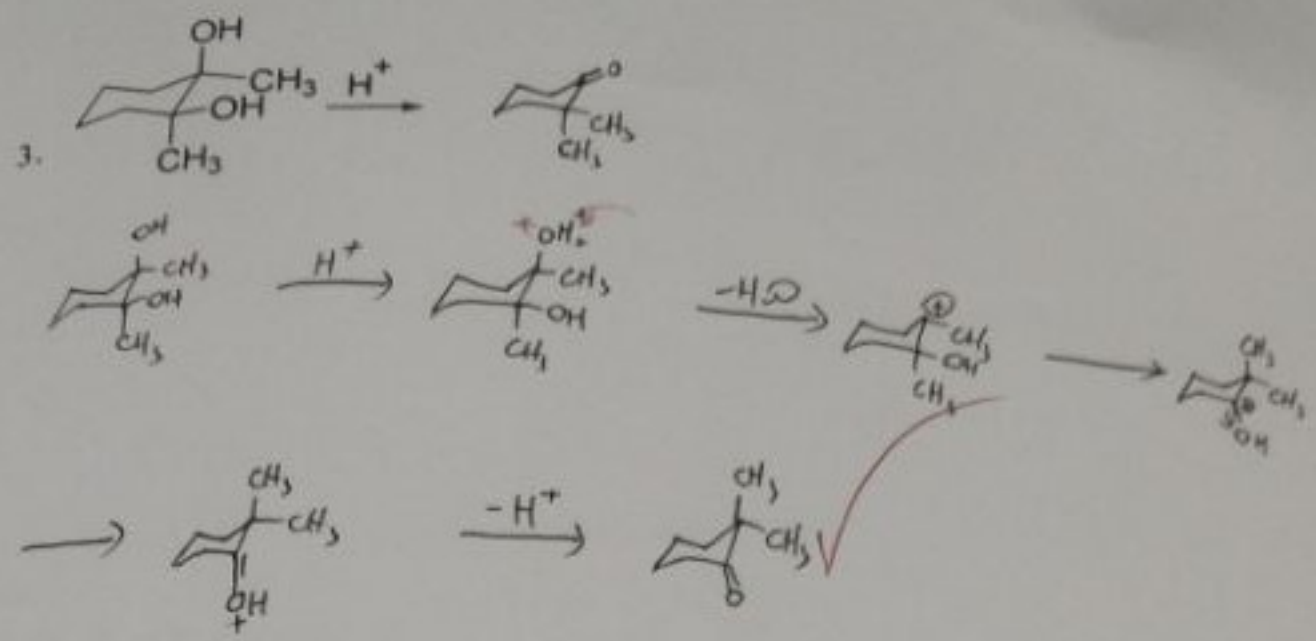


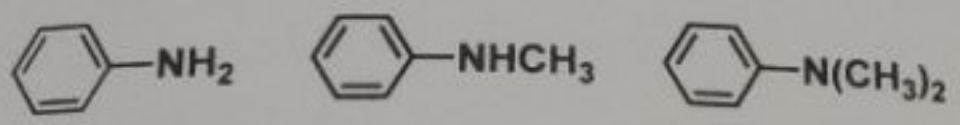


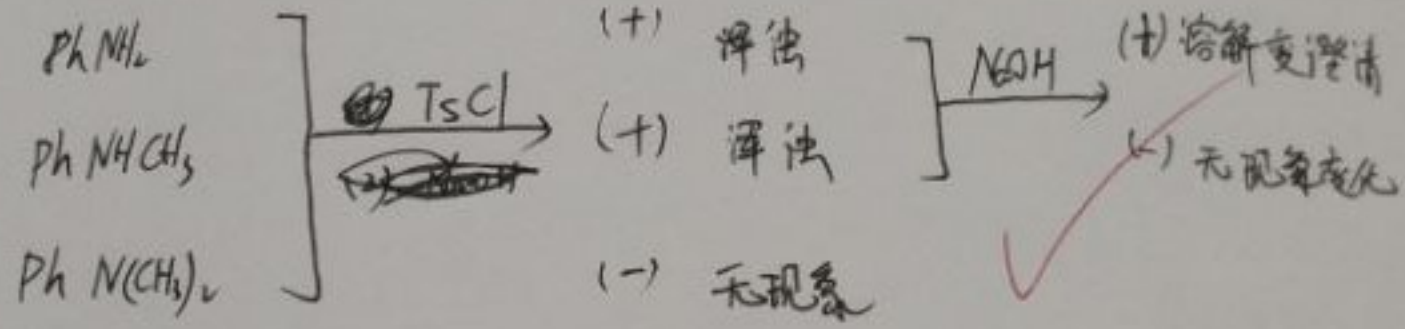
3.



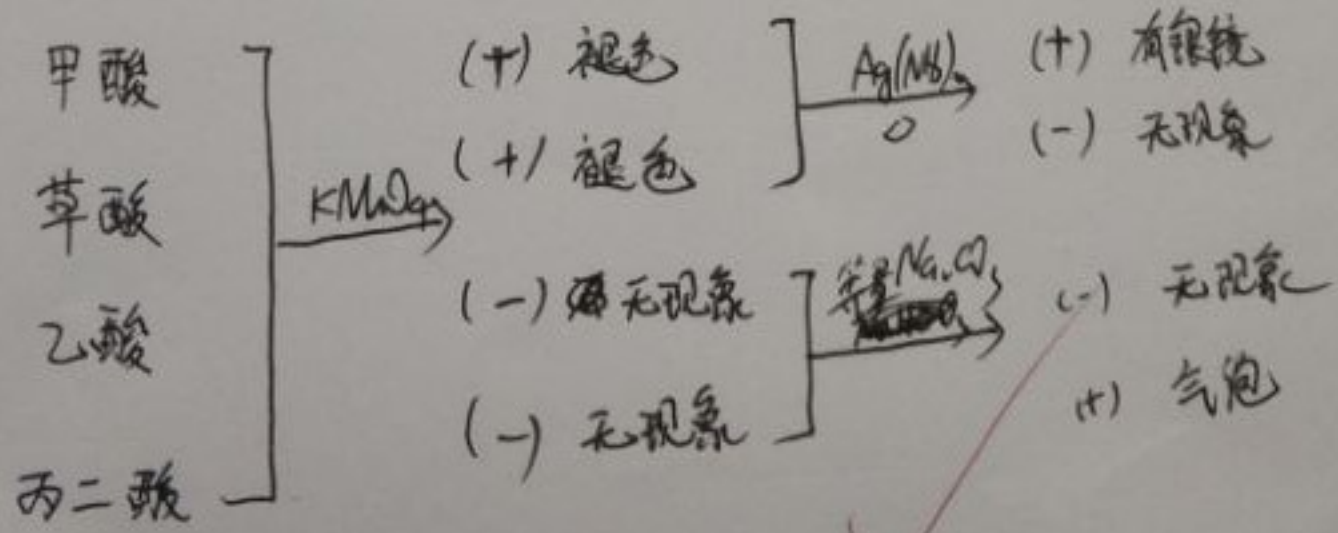
Part 6. Identify the following compounds in chemical ways (7') :

1.





2. 甲酸，乙酸，草酸，丙二酸



Part 7. Structures（6'×3 = 18）：

1. 化合物 A(C_7H_{12})，催化加氢后生成 B(C_7H_{14})，A 经臭氧化还原水解后得到 C($C_7H_{12}O_2$)，C 经湿的氧化银处理后生成 D($C_7H_{12}O_3$)，D 可发生碘仿反应生成 E($C_6H_{10}O_4$)，E 加热时转化为 F($C_6H_8O_3$)，D 经 Zn-Hg/HCl 还原生成 3-甲基己酸。试推测 A、B、C、D、E、F 的结构。（本题 9 分）

A:

B:

C:

D:

E:

F:

或

-3

2. 化合物(A)$C_8H_{17}N$，其核磁共振谱无双重峰，它与 2 mol CH_3I 反应，然后与 Ag_2O(湿)作用，接着加热则生成一个中间体（B），其分子式为 $C_{10}H_{21}N$。(B)进一步甲基化后与湿的 Ag_2O 作用，加热则生成三甲胺、1，5-辛二烯和 1，4-辛二烯混合物，写出化合物 A 和 B 的结构式。（本题 4 分）

A:

B:

3. 化合物 A 和 B，分子式均为 $C_4H_8O_2$，它们的谱在 1735 cm^{-1} 附近都有强吸收，它们的 ^1H NMR 谱数据如下：

A：1.3（t，3H），2.0（s，3H），4.1（q，2H）ppm。

B：1.2（t，3H），2.3（q，2H），3.7（s，3H）ppm。

试推测 A、B 的结构。（本题 5 分）

A:

B:

-2

7