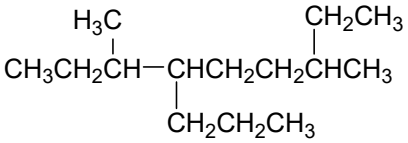
中国科学技术大学

2022-2023 学年度第一学期期中考试试卷

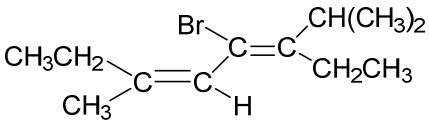
考试科目：有机化学 B　　得分_____

学生所在系：#########姓名：##############学号：##########

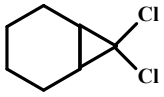
一、填空与选择题（每题 1.5 分，共 30 分）

1. 

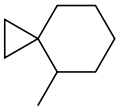
的 IUPAC 名称是：3,7-二甲基-4-丙基壬烷

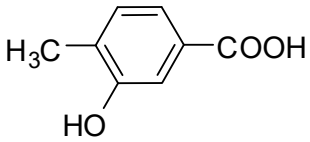
2. 

的 IUPAC 名称（3Z,5Z）-2,6-二甲基-3-乙基-4-溴-3,5-辛二烯

3. 

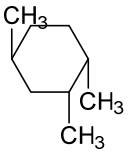
的 IUPAC 名称是：7,7-二氯[4.1.0]-庚烷

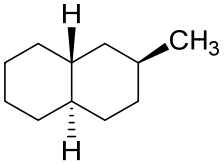
4. 
的 IUPAC 名称是：4-甲基螺[2.5]辛烷

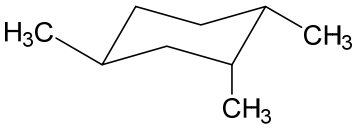
5. 

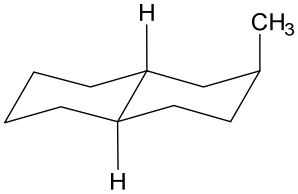
的 IUPAC 名称是：4-甲基-3-羟基苯甲酸

6. 画出下列化合物最稳定的构象（优势构象）

（1） 

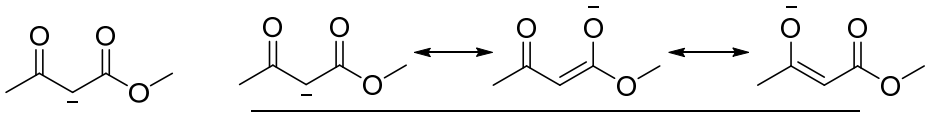
（2） 



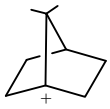


_____　　_____

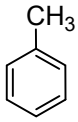
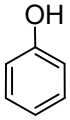
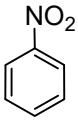
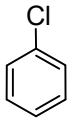
7. 写出下列结构可能的共振式



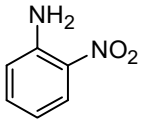
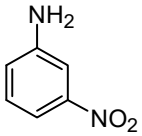
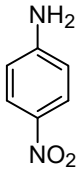
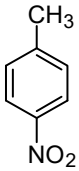
8. 下列碳正离子中最稳定的是:（ A ）

A. $CH_2{=}CH\overset{+}{C}HCH_3$ B. $CH_3\overset{+}{C}HCH_2CH_3$ C.  D. $\overset{+}{C}H_2CH_3$

9. 下列有机物的硝化活性最大的是:（ B ）

A.  **B.**  **C.**  **D.** 

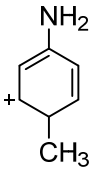
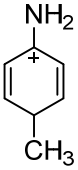
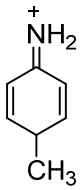
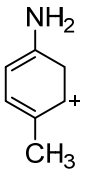
10. 下列化合物中，偶极矩最大的是:（ C ）

A.  B.  C.  D. 

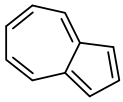
11. 下列烷烃中沸点最高的是： (D)； 沸点最低的是：(A)

A. 新戊烷 B. 异戊烷 C. 正己烷 D. 正辛烷

12. 在下列共振结构式中，对共振杂化体贡献最大的是:（ C ）

A.  B.  C.  D. 

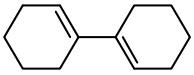
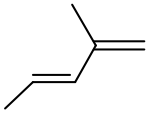
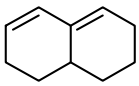
13. 下列化合物没有芳香性的是： (A)

A 环 辛四烯 B 呋喃 C: D: 

14. 下列化合物与溴加成反应时速度最快的是:（ A ）

A. $(CH_3)_2CH{=}CH_2$ B. $CH_2{=}CH_2$ C. $CH_2{=}CH{-}CH_2Cl$ D. $CH_2{=}CH{-}F$

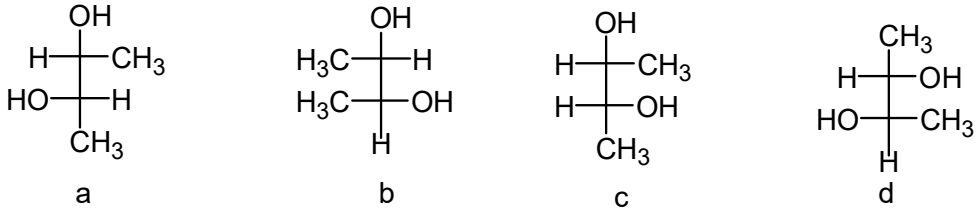
15. 下列化合物中，不能作为双烯体发生 Diels-Alder 反应的是:（ D ）

A.  B. C.  D. 

16. 内消旋酒石酸和外消旋酒石酸性质相同的是:（ D ）

A．熔点　　B. 沸点　　C. 在水中的溶解度　　D. 比旋光度

17. 下列哪两个化合物互为对映体：（ C ）



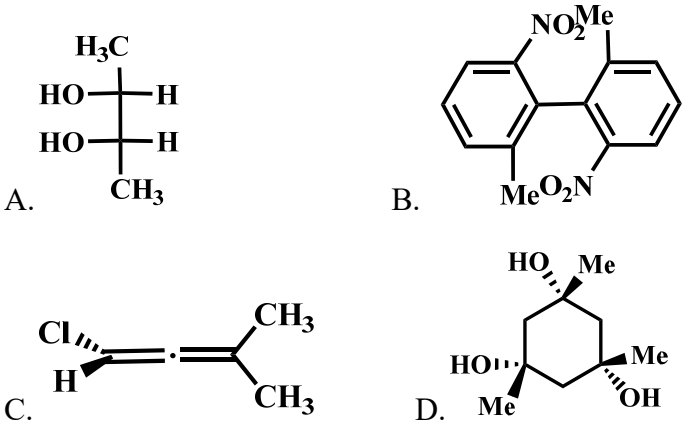
A. a and b　　B. a and c　　C. b and c　　D. c and d

18. 不能鉴别环丙烷和丙炔的试剂是:（ A ）

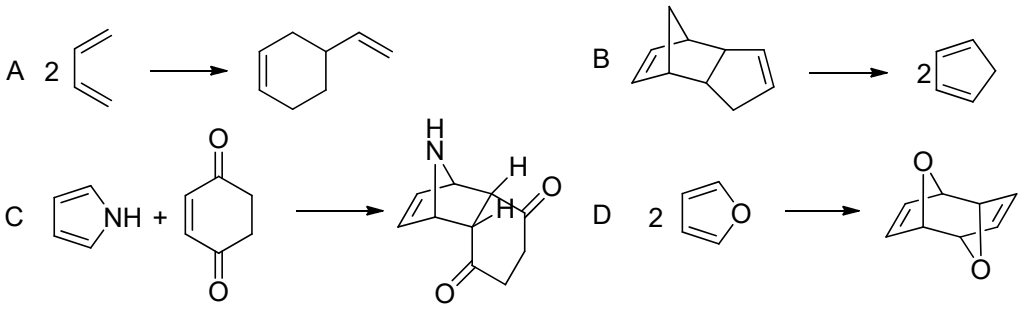
A. 溴的四氯化碳溶液　　B. 高锰酸钾溶液

C. $Ag(NH_3)_2NO_3$　　D. $Cu(NH_3)_2Cl$

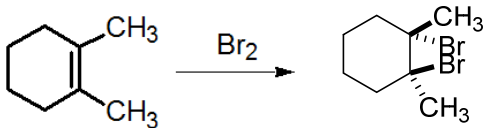
19. 下列分子有手性的是：（ B ）



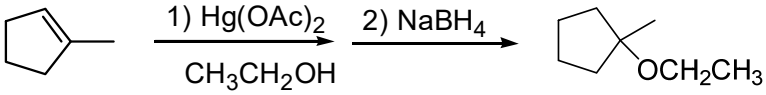
20.下列哪个反应是光照下发生的：（ D ）

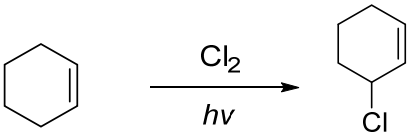


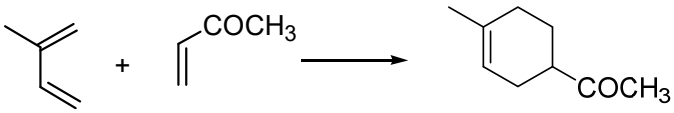
二. 完成下列反应，写出主要产物，注意立体化学信息 (每空 1.5 分, 共 30 分,)

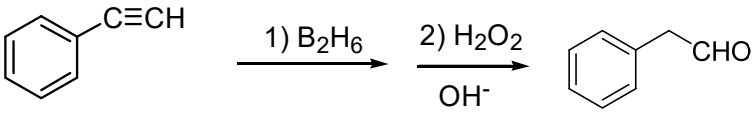
1. 

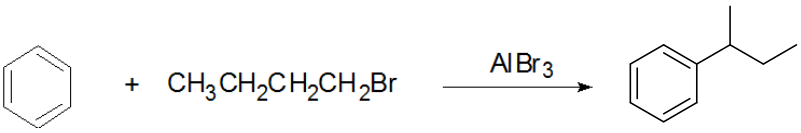
(±)

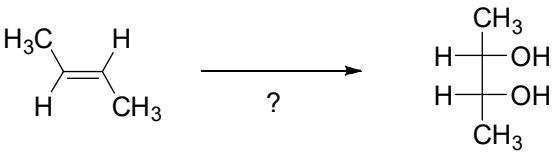
2. 

3. 

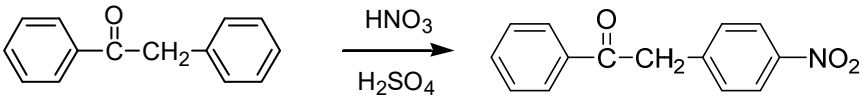
4. 

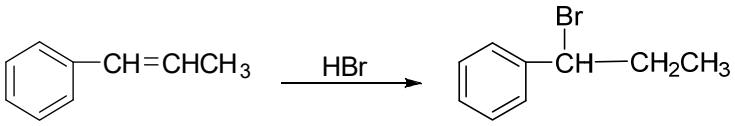
5. 

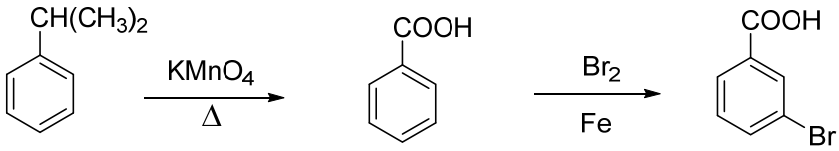
6. 

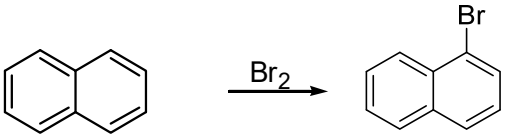
7. 

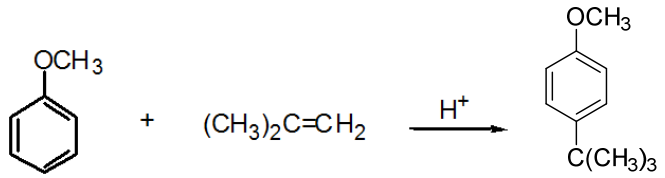
1) RCOOOH, Na_2CO_3; 2) H^+, H_2O

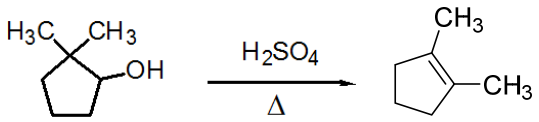
8. 

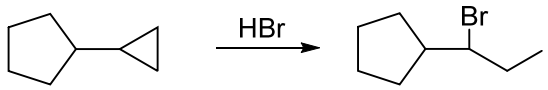
9. 

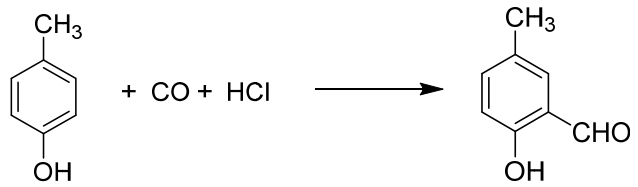
10. 

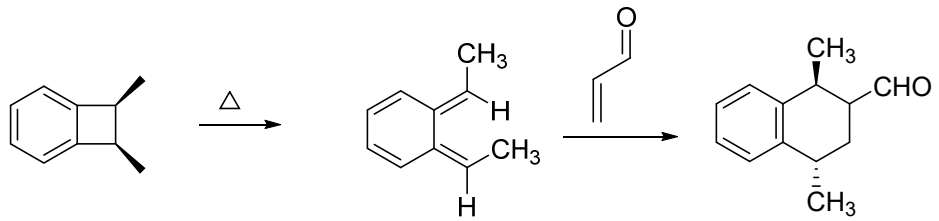
12. 

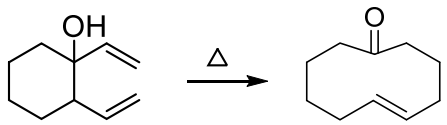
13. 

14. 

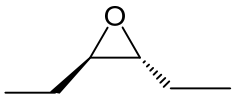
15. 

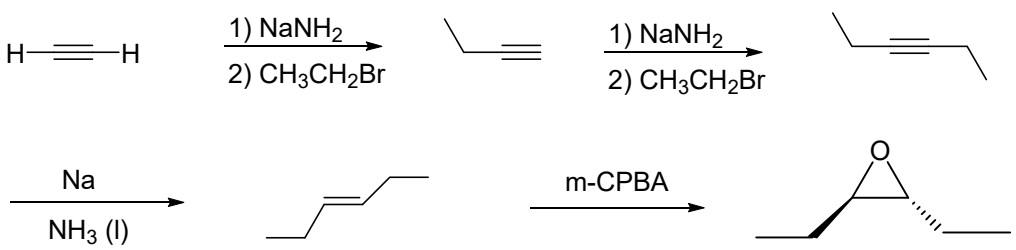
16. 

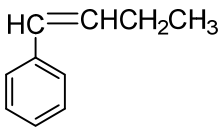
17. 

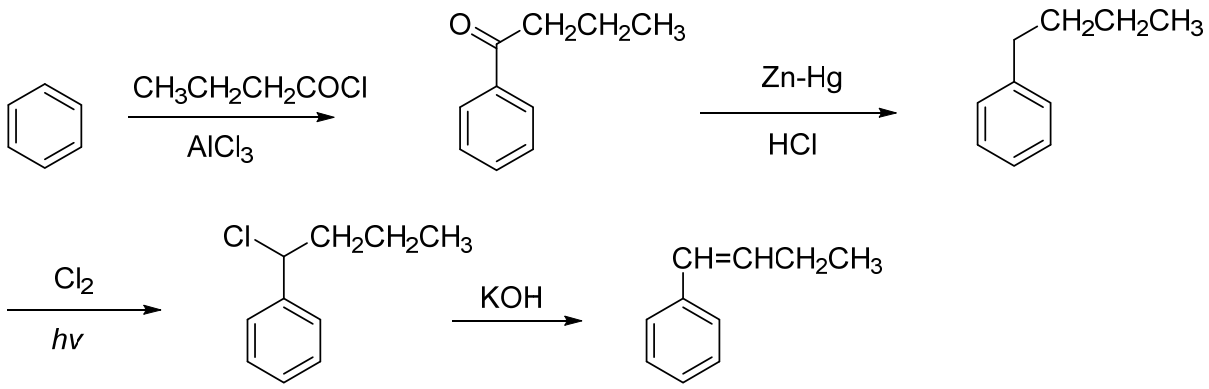
18. 

三．合成题（每小题 5 分，共 20 分）

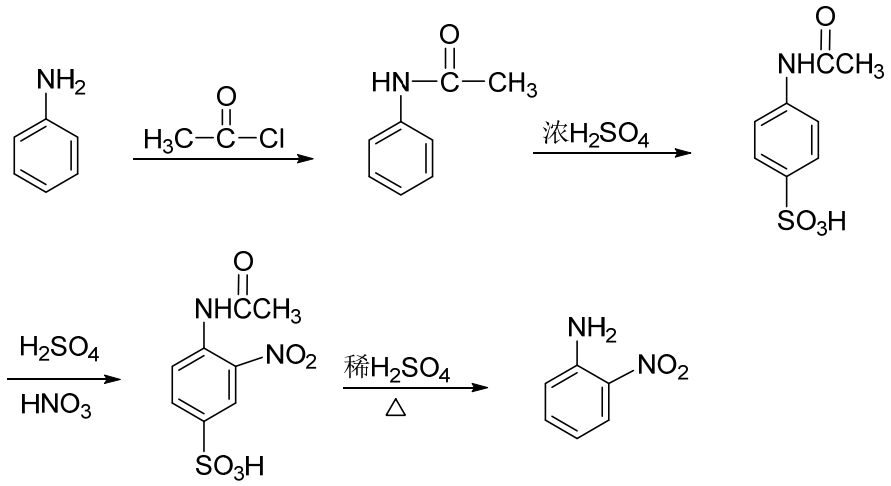
1. 以乙炔和其他必要的试剂为原料合成： 

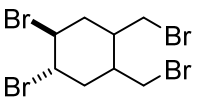


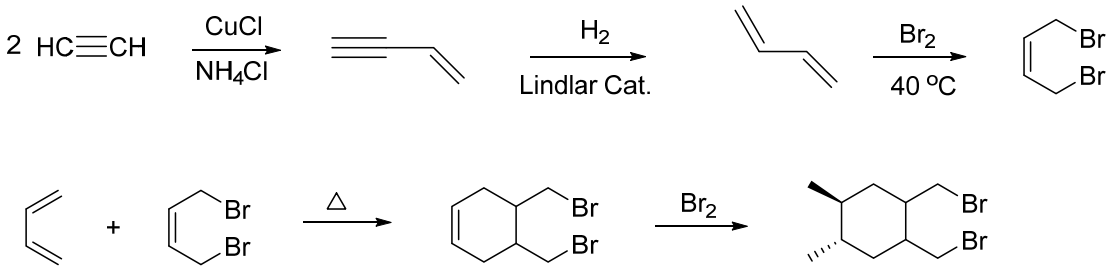
2. 以苯和其他必要的试剂为原料合成: 



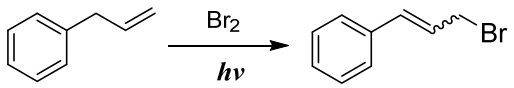
3. 以苯胺和其他必要的试剂为原料合成邻硝基苯胺。

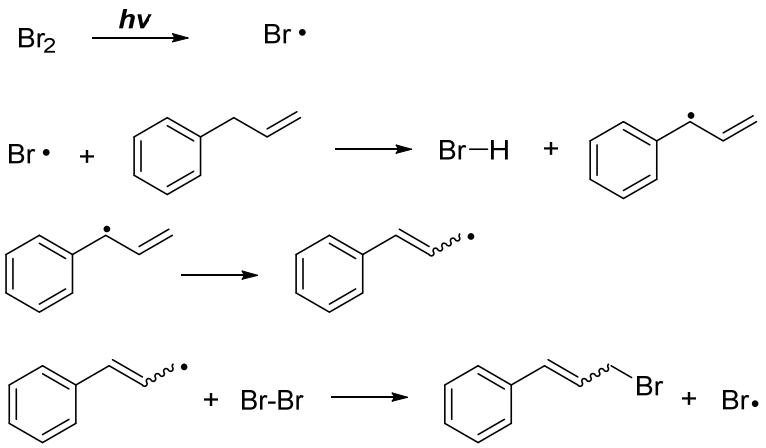


4. 以乙炔为原料合成： 

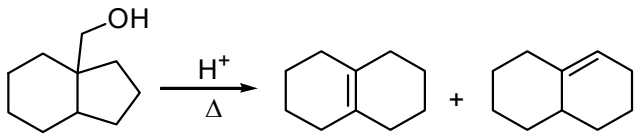


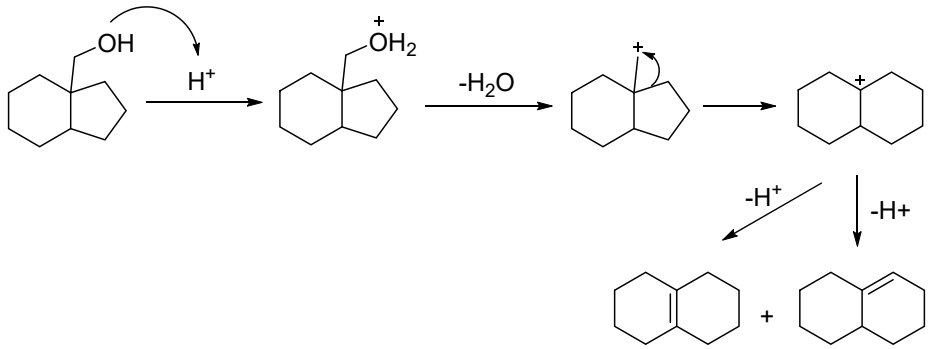
四．机理题，写出下列过程合理的机理（每小题 5 分，共 10 分）

1. 



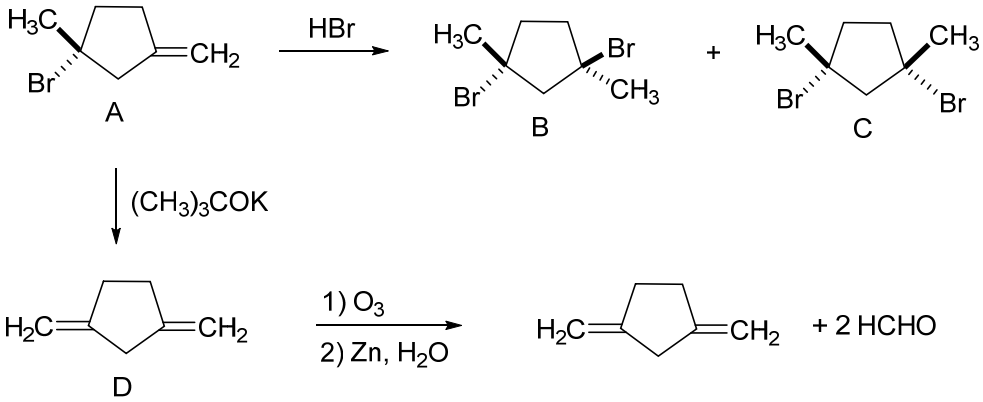
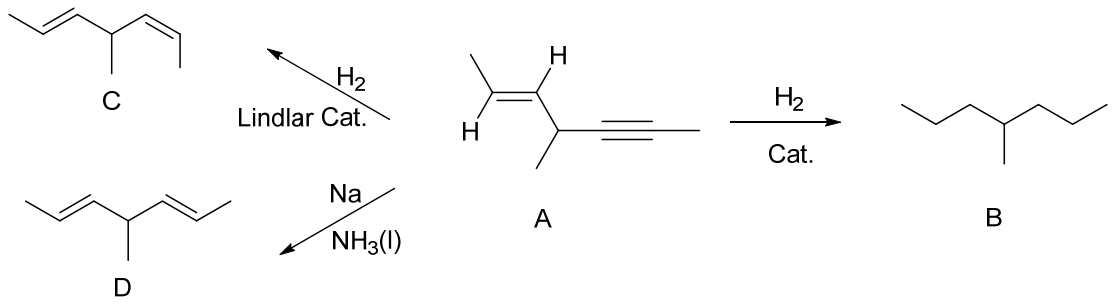
2.





五．结构解析（每小题 5 分，共 10 分）

1、某旋光化合物 A($C_7H_{11}Br$)，和 HBr 作用得到分子式均为 $C_7H_{12}Br_2$ 的异构体 B 和 C，已知 B 有旋光性，而 C 无旋光性。A 在$(CH_3)_3COK$ 的作用下，消除得到化合物 D(C_7H_{10})。D 经 O_3 和 Zn/H_2O 后得到两分子 HCHO 和 1,3-环戊二酮。试推断化合物 A、B、C、D 的结构式, 并写出相应的反应式。



2、某烃类化合物 A (C_8H_{12}) 有光学活性，当催化加氢后得到没有光学活性的化合物 B (C_8H_{18}), 在 Lindlar Pd 催化下，A 加氢得到 C (C_8H_{14})，有光学活性。而 A 与 Na/液氨反应，则得到没有光学活性的 D (C_8H_{14})。试推测 A、B、C、D 的结构，并写出相应的反应式。