聊城大学

2007 年硕士研究生招生入学考试(初试、复试)试题

学科专业名称：有机化学 物理化学 考试科目名称：有机化学(A)

考生注意事项：1、本试卷共 6 道大题(计 58 个小题)，满分 150 分。

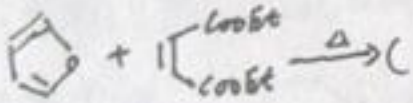
2、本卷属试题，答题另有答题纸。答案一律写在答题纸上，写在该试题纸或草纸上均无效。要注意试卷清洁，不要在试卷上涂划。

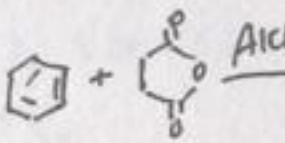
3、答题必须用蓝、黑钢笔或圆珠笔书写，其它均无效。

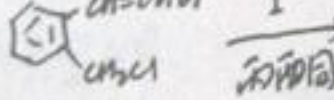
一、完成下列反应(对立体选择性反应，需写出产物的立体构型)(40分)

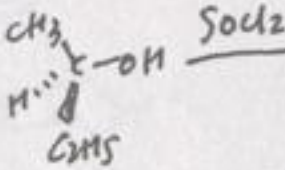
1.  ( )

2. $CF_3CH=CHCl \xrightarrow{HI}$ ( )

3.  ( )

4.  ( )

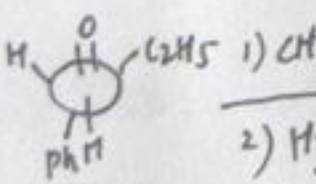
5.  ( )

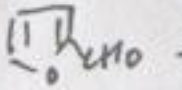
6.  ( )

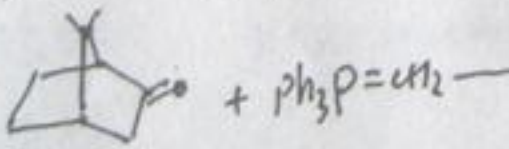
7. $(CH_3)_3C-\underset{OH}{CH}-CH_3 \xrightarrow{H_2SO_4}$ ( )

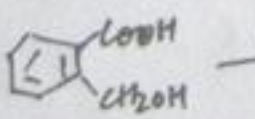
8. $CH_3O-C(CH_3)_3 \xrightarrow{HI}$ ( )

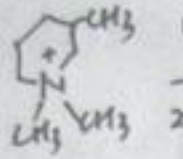
9. $CH_3-\underset{O}{CH}-CH_2 + CH_3OH \xrightarrow{CH_3O^-}$ ( )

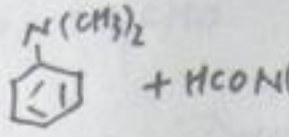
10.  ( )

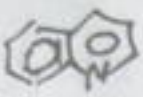
11.  ( )

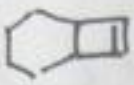
12.  ( )

13.  ( )

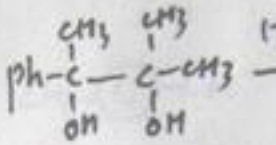
14.  1) Ag_2O 2) Δ → (　　)

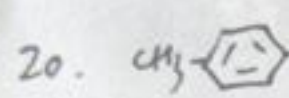
15.  $+ HCON(CH_3)_2$ $\xrightarrow{POCl_3}$ (　　)

16.  $\xrightarrow{KMnO_4/H^+}$ (　　)

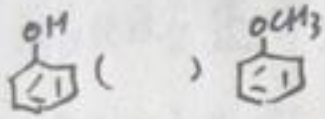
17.  $\xrightarrow{250°C}$ (　　)

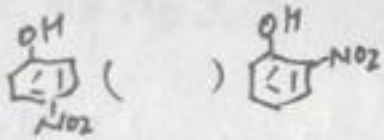
18.  $\xrightarrow{\Delta}$ (　　)

19.  $\xrightarrow{H_2SO_4}$ (　　)

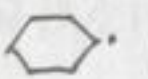
20.  $\xrightarrow[\Delta]{P_2O_5}$ (　　)

二、按指定的性质和要求排列大小（用">"或"<"表示）(40分)

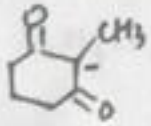
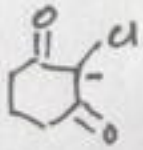
1. 沸点： 

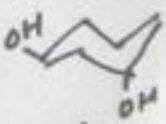
2. 沸点： 

3. 偶极矩：$CH_2=CHCl$ (　　) $CCl_2=CCl_2$

4. 稳定性：  (　　) 

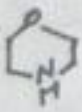
5. 稳定性：  (　　) 

6. 稳定性：  (　　) 

7. 稳定性：  (　　) 

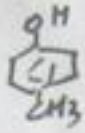
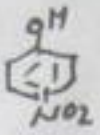
8. 芳香性：噻吩 (　　) 呋喃

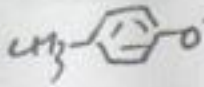
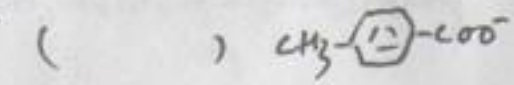
9. 酸性：$HC\equiv CCH_2COOH$ (　　) $H_2C=CHCH_2COOH$

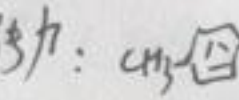
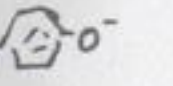
10. 碱性：  (　　) 

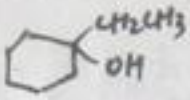
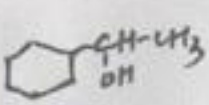
11. 生成水合物的活性：CH_3CHO（　　）CCl_3CHO

12. 与 KCN 反应活性：（　　）

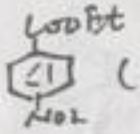
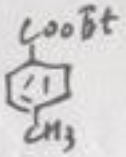
13. 与 Br_2 反应活性：  （　　） 

14. 亲核性：  （　　） 

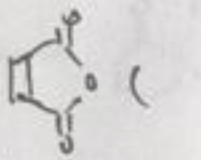
15. 作为离去基团的离去能力：  （　　） 

16. 酸催化脱水活性：  （　　） 

17. 与 CH_3COOH 酯化反应速率：$(CH_3)_3C-OH$（　　）CH_3CH_2OH

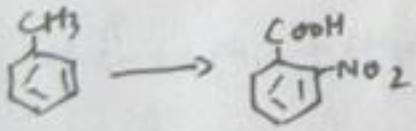
18. 碱性水解反应速率：  （　　） 

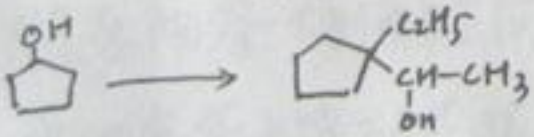
19. 烯醇含量：$CH_3COCH_2COCH_3$（　　）$PhCOCH_2COCH_3$

20. 与 1,3-丁二烯的反应活性：  （　　）$CH_3C{\equiv}CCH_3$

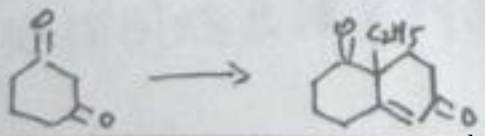
三. 合成（由指定原料开始，其他原料任选）（32分）

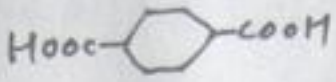
1. $HC{\equiv}CH \longrightarrow CH_3CH_2CH_2CH_2OH$

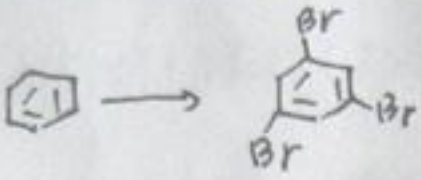
2. 

3. 

4. 

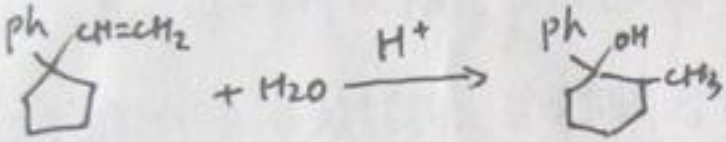
5. 

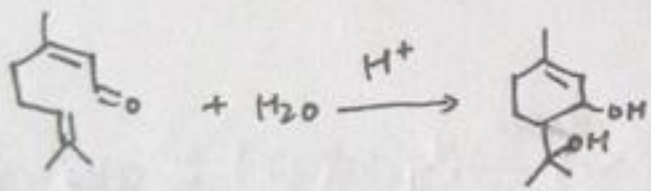
6. $CH_2(COOEt)_2 \longrightarrow$ 

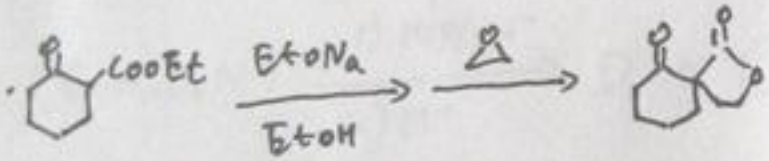
7. 

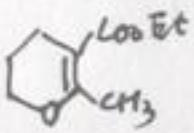
8. $CH_2=CHCH_3 \longrightarrow CH_3CH_2CH_2-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-O-CH_2CH_2CH_3$

四、写出下列反应的机理（20分）

1. 

2. 

3. 

4. $CH_3COCH_2COOEt + BrCH_2CH_2CH_2Br \xrightarrow[EtOH]{EtONa}$ 

5. $CH_3\overset{O}{\overset{\|}{C}}-OCPh_3 + CH_3OH \xrightarrow{H^+} CH_3COOH + CH_3OCPh_3$

五、简要回答下列实验问题（10分）

1. 实验室蒸馏乙醚时应注意哪些问题？

2. 熔点相同的两种样品是否一定为同一种物质？如何用熔点法来判断？

3. 在硝基苯的制备中，H_2SO_4 的作用是什么？

六、推测结构（8分）

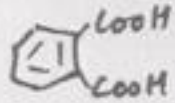
1. 化合物A和B化学式均为 $C_{10}H_{12}O$，IR在 $1720\,cm^{-1}$ 附近有强吸收。^1HNMR：

A. $\delta = 7.2$ (m, 5H), 3.6 (s, 2H), 2.3 (q, 2H), 1.0 (t, 3H)。

B. $\delta = 7.1$ (m, 5H), 2.7 (t, 2H), 2.6 (t, 2H), 1.9 (s, 3H)。

试推测A、B的结构，并标明各吸收峰的归属。

2. 化合物 $A\ (C_8H_5O_2N) \xrightarrow{KOH} B\ (C_8H_4O_2K) \xrightarrow{PhCH_2Cl}$

$C\ (C_{15}H_{11}O_2N) \xrightarrow[2)\ H^+]{1)\ H_2O/OH^-} D +$ 

试推测 A→D 的结构