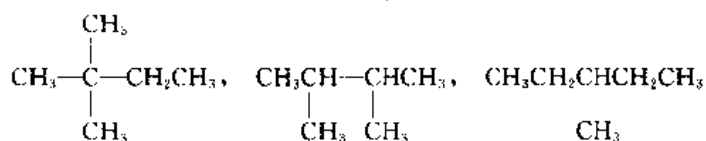


教材中的问题及习题答案

第二章 烷 烃

问题 2.1 $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$, $\text{CH}_3\text{CHCH}_2\text{CH}_2\text{CH}_3$,



问题 2.2 (1) = (6), (2) = (4), (3) = (5), (7) = (8)

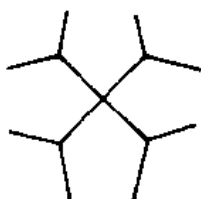
问题 2.3 略

问题 2.4 己烷 2-甲基戊烷 2,2-二甲基丁烷 2,3-二甲基丁烷 3-甲基戊烷 2,4-二甲基戊烷
3,3-二乙基戊烷 2-甲基戊烷 2,2,4-三甲基戊烷

问题 2.5



(1)



(2)



(3)

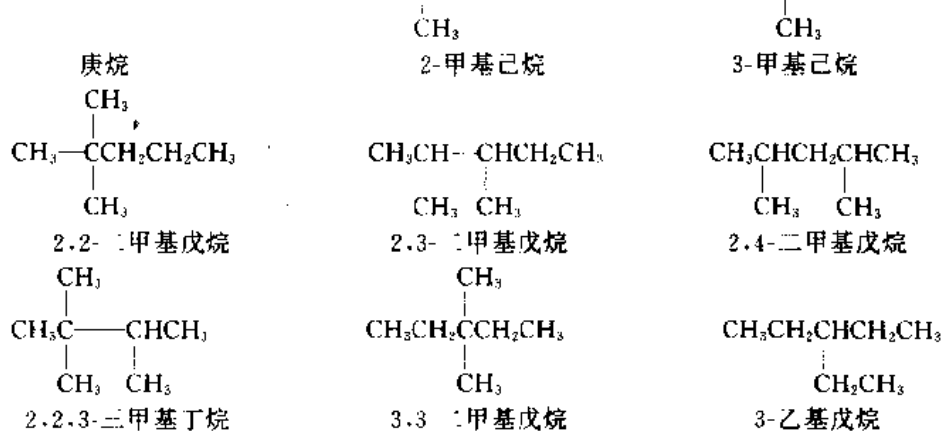


(4)

问题 2.6 略

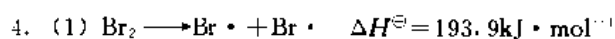
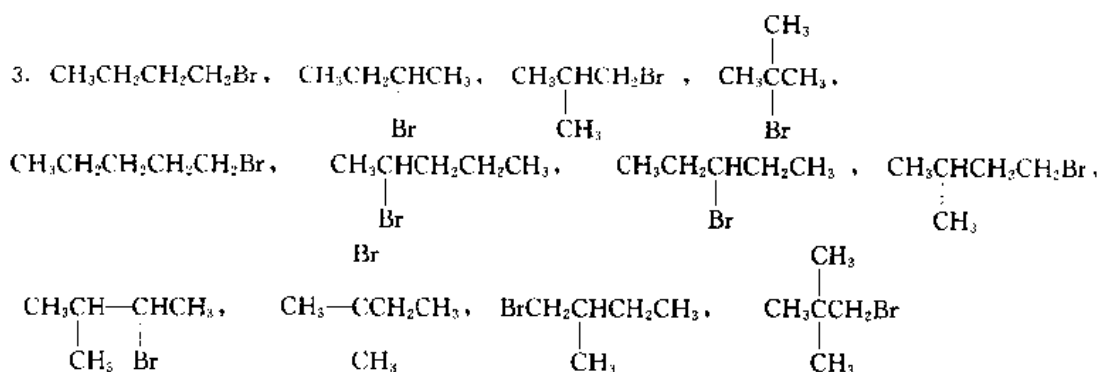
问题 2.7 (1) 没有链引发条件。(2) 氯气光照后产生自由基, 迅速与 CH_4 混合可引起链增长。(3) 氯自由基产生后又互相碰撞终止。(4) 甲烷光照后, 不能产生自由基, 无链引发。(5) 链增长。

习题: 1. $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ $\text{CH}_3\text{CHCH}_2\text{CH}_2\text{CH}_2\text{CH}_3$ $\text{CH}_3\text{CH}_2\text{CHCH}_2\text{CH}_2\text{CH}_3$

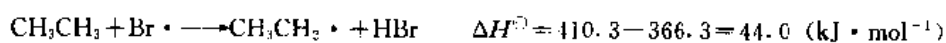


2. (1) 2,5-二甲基己烷 (2) 2,6,6-三甲基-3-乙基辛烷

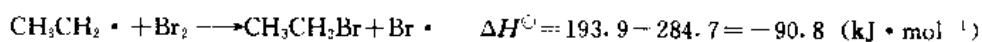
- (3) 2,6,7-三甲基壬烷 (4) 3,3,4,5-四甲基-4-乙基庚烷
(5) 3,3-二乙基戊烷



$$193.9$$

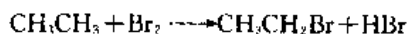


$$410.3 \quad 366.3$$



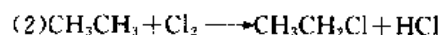
$$193.9 \quad 284.7$$

$$\Sigma \Delta H^\ominus = -90.8 + 44.0 = -46.8 \text{ (kJ} \cdot \text{mol}^{-1})$$



$$410.3 \quad 193.9 \quad 284.7 \quad 366.3$$

$$\Delta H^\ominus = (410.3 + 193.9) - (284.7 + 366.3) = -46.8 \text{ (kJ} \cdot \text{mol}^{-1})$$



$$410.3 \quad 242.6 \quad 334.9 \quad 432.1$$

$$\Delta H^\ominus = (410.3 + 242.6) - (334.9 + 432.1) = -114.1 \text{ (kJ} \cdot \text{mol}^{-1})$$



$$376.8 \quad 242.6 \quad 355.9$$

$$\Delta H^\ominus = (376.8 + 242.6) - 355.9 \times 2 = -92.4 \text{ (kJ} \cdot \text{mol}^{-1})$$

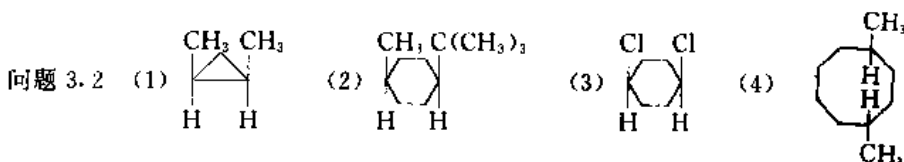
后一个反应不能在室温下进行。



反应活化能很大,反应只能按前式进行。

第三章 环 烷 烃

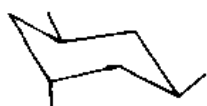
- 问题 3.1 (1) 环壬烷 (2) 环癸烷 (3) 1,1-二甲基-4-异丙基环癸烷
(4) 1,1-二环丙基丁烷 (5) 1,2-二环丙基丁烷



问题 3.3 约 67%。

问题 3.4

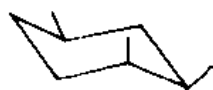
(1)



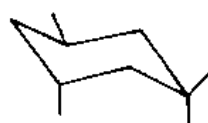
(2)



(3)

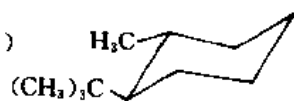


(4)

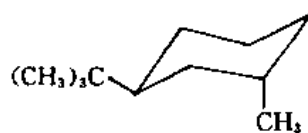


问题 3.5

(1)



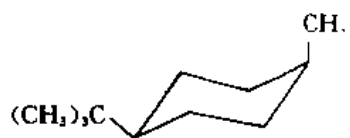
(2)



(3)



(4)



问题 3.6

(1)



(2)

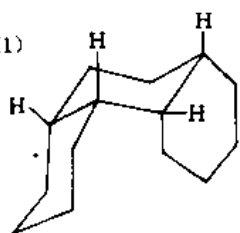


(3)

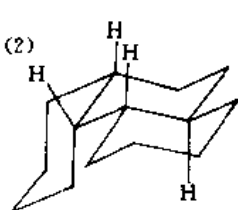


习题:

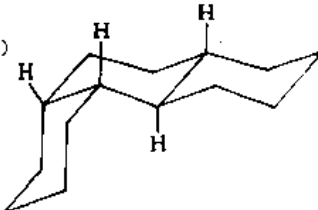
(1)



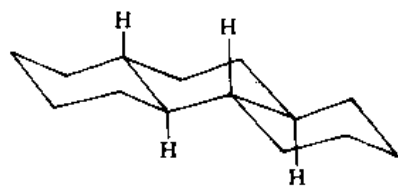
(2)



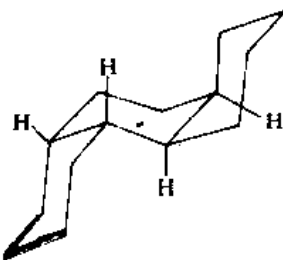
(3)



(4)



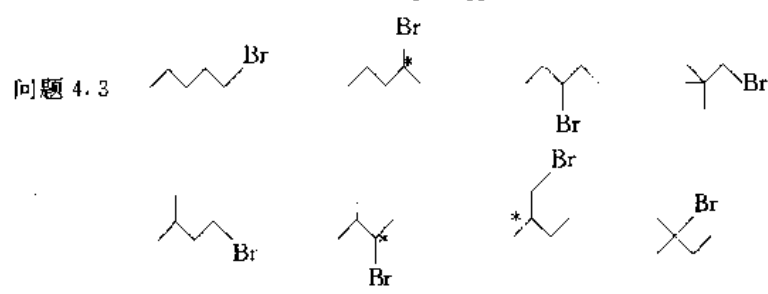
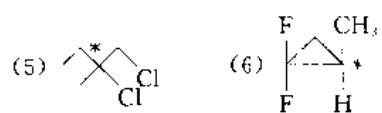
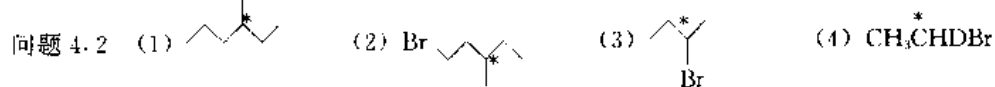
(5)



第四章 对映异构

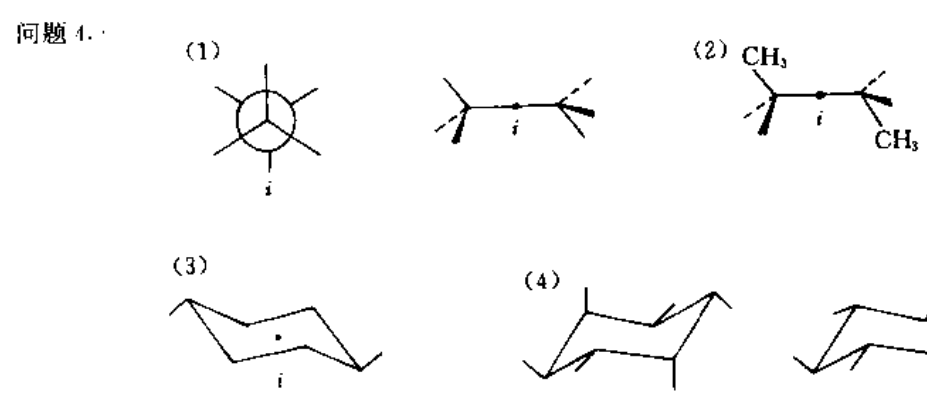
问题 4.1 溶液稀释一倍, 旋光度也减少一倍。

前者为 $+5^\circ$, 后者为 -175° 。

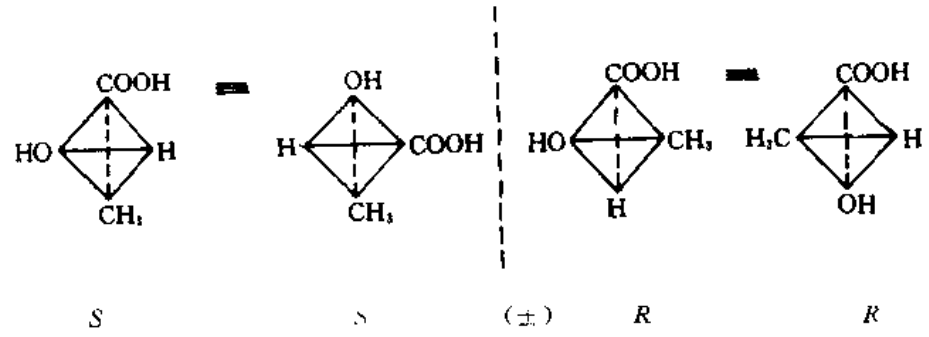


问题 4.4 (1) c_3 (2) c_2 (3) c_2
 (4) c_2 (5) c_2

问题 4.5 (1) 2σ (2) 3σ (3) 3σ (4) 3σ
 (5) 4σ (6) 2σ (7) 3σ (8) 2σ

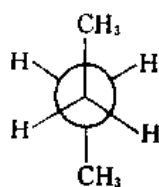


问题 4.7

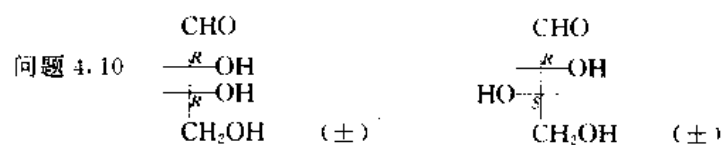


问题 4.8 (1) R (2) R (3) S (4) S (5) S (6) S

问题 4.9 在最稳定的反交叉式构象中

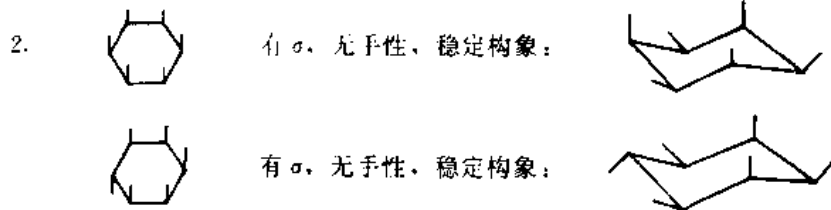
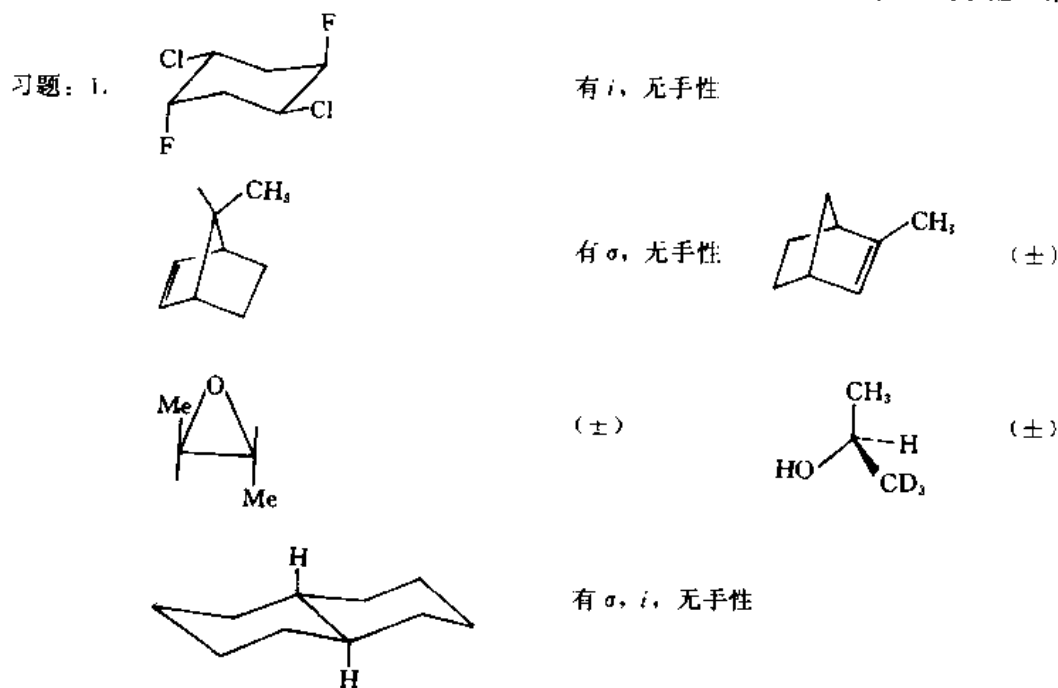
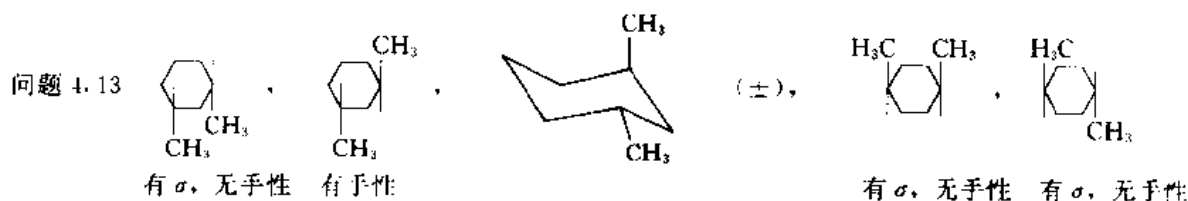
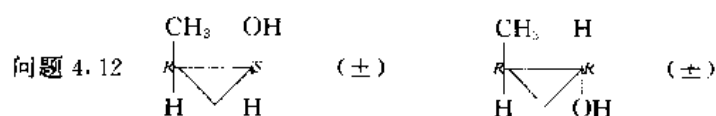


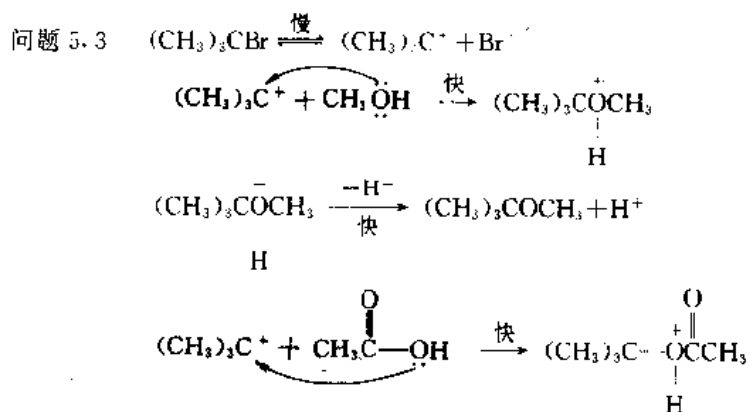
有 i, σ , 无旋光。而另一些构象无 σ, i , 但所占份额很少, 而且以成对对映体出现, 无旋光。

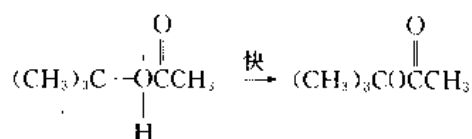


问题 4.11

(12) 中有 c_3 (13) 中有 c_3
 (14) 中有 c_2 (15) 中有 c_2 (16) 中有 σ

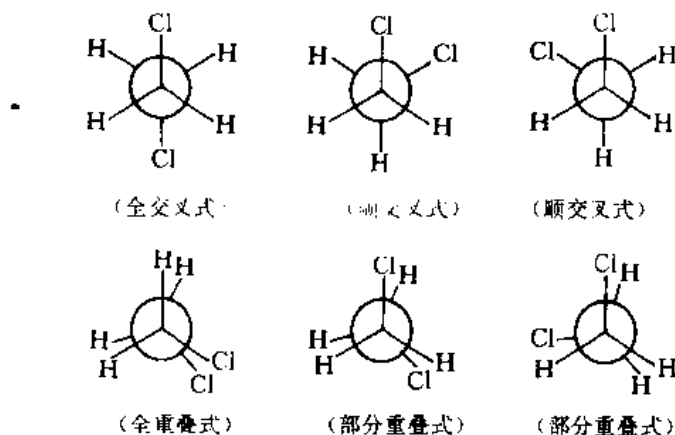




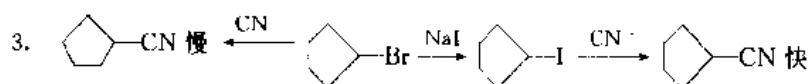
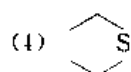
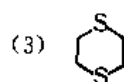
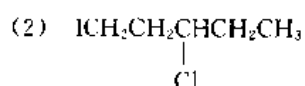
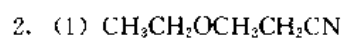


- 问题 5.4 (1) 1-氯戊烷快, $\text{S}_{\text{N}}2$ 反应中, 伯 > 仲 > 叔。
 (2) 叔丁基溴快, $\text{S}_{\text{N}}1$ 反应中, 叔 > 仲 > 伯。
 (3) 2-甲基-2-溴戊烷快, 同 (2)。
 (4) 在甲醇钠-甲醇溶液中反应快, $\text{S}_{\text{N}}2$ 反应中, CH_3O^- 亲核性强。

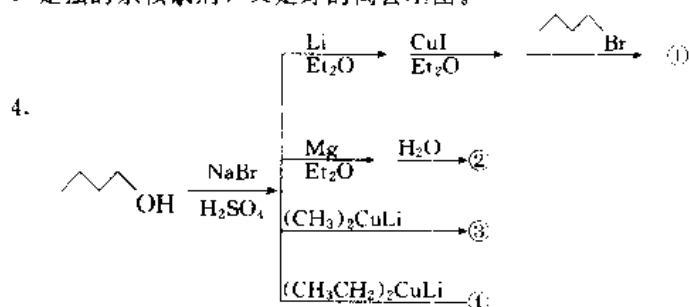
习题: 1. 1,2-二氯乙烷各种构象的纽曼投影式:



其中 最稳定, 温度越低, 这种稳定构象的含量也越高, 所以它的偶极矩随温度降低而减少。

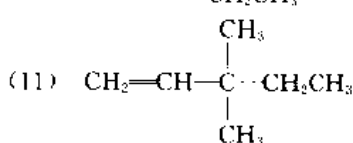
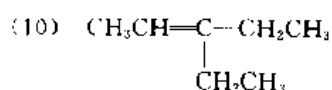
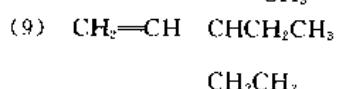
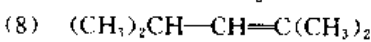
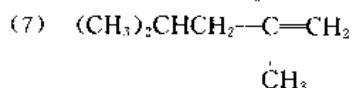
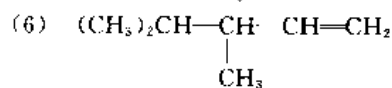
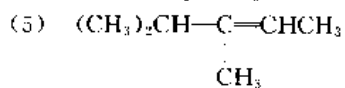
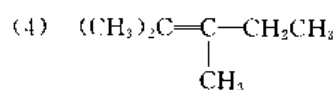
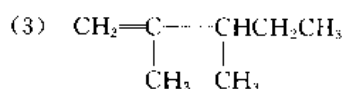
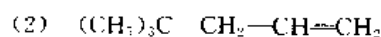
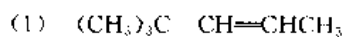


I 是强的亲核试剂, 又是好的离去基团。



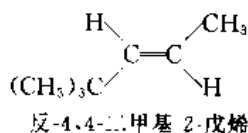
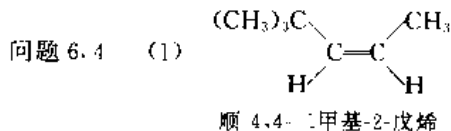
第六章 烯 烃

问题 6.1 共有 11 个。



问题 6.2 顺-2-丁烯: $2\sigma, \epsilon_2$; 反-2-丁烯: σ, i, ϵ_2

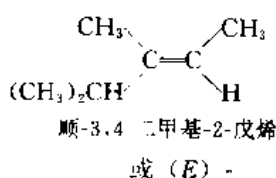
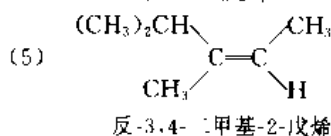
问题 6.3 (1) 和 (5)



(2) 4,4-二甲基-1-戊烯

(3) 2,3-二甲基-1-戊烯

(4) 2,3-二甲基-2-戊烯



(6) 3,4-二甲基-1-戊烯

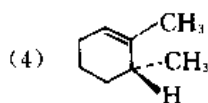
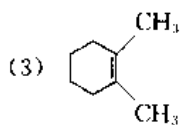
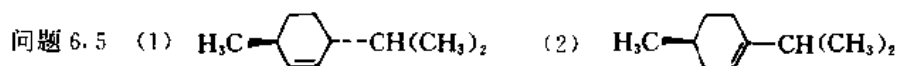
(7) 2,4-二甲基-1-戊烯

(8) 2,4-二甲基-2-戊烯

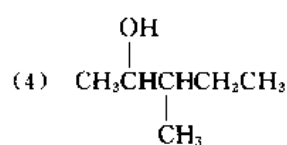
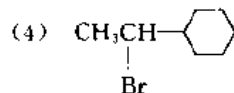
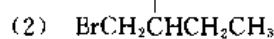
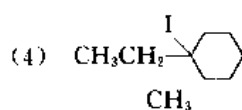
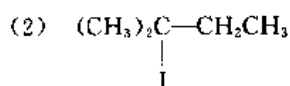
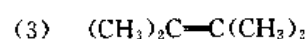
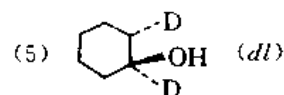
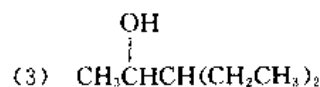
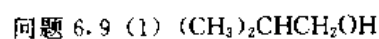
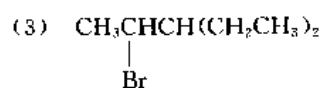
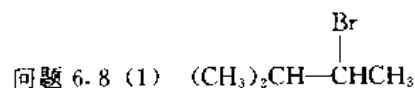
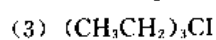
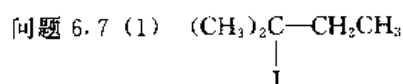
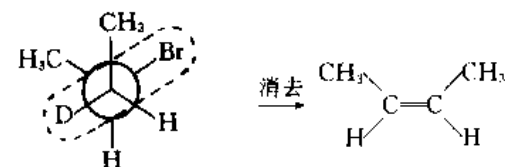
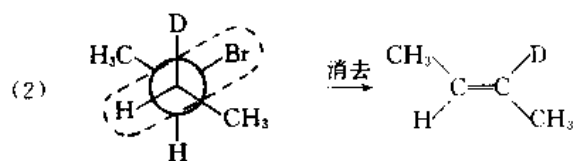
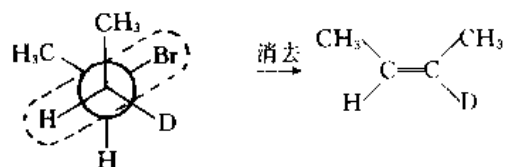
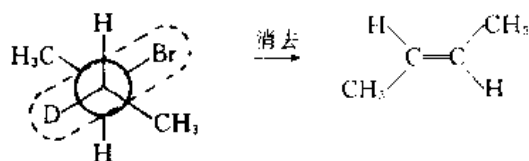
(9) 3-乙基-1-戊烯

(10) 3-乙基-2-戊烯

(11) 3,3-二甲基-1-戊烯



问题 6.6 (1)



习题: 1. (1) HI

(3) i) O_3 , ii) $Zn+HOAc$

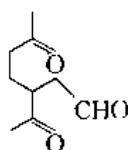
(5) Br_2/H_2O

(7) i) $Hg(OAc)_2, H_2O-THF$, ii) $NaBH_4$

(2) HBr , 过氧化物

(4) 

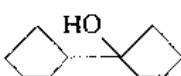
(6) i) B_2H_6 ii) H_2O_2, OH^-

(8)  + $HCHO$

2. (1)



(2) $(CH_3)_2C=CHCH_2CH_2CH(CH_3)_3CH(CH_2)_3CH(CH_3)_2$

(3) 

(4) A: $(CH_3)_3CCH_2CH_3$

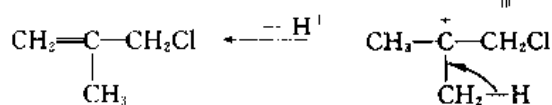
B: $(CH_3)_3CCH(Cl)CH_3$

C: $(CH_3)_3CCH_2CH_2Cl$

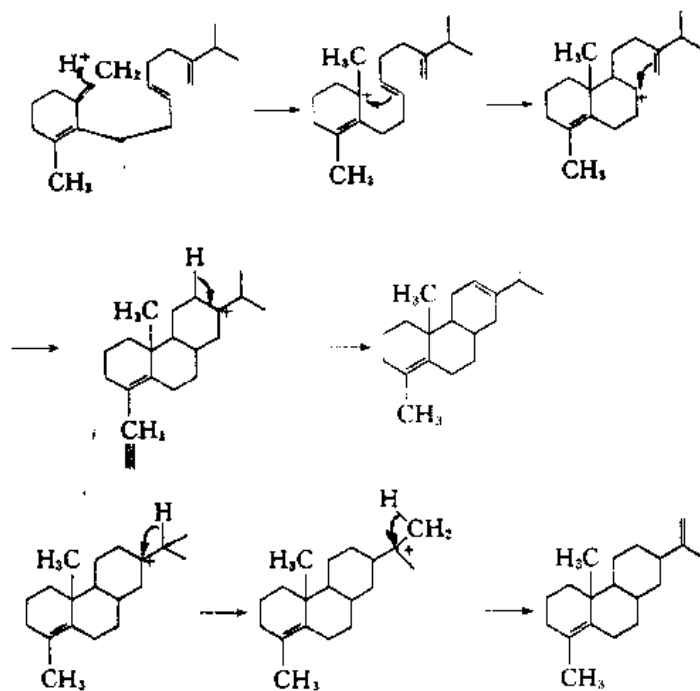
D: $(CH_3)_2CCH_2CH_2CH_2Cl$

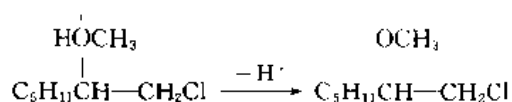
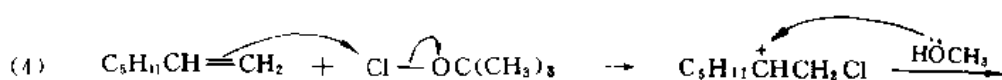
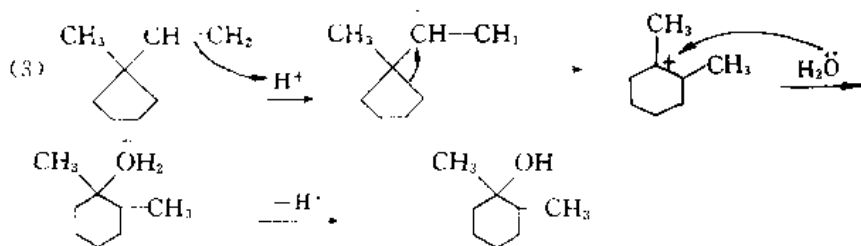
E: $(CH_3)_3CCH=CH_2$

3. (1) $(CH_3)_2C=CH_2 + Cl-Cl \rightarrow CH_3-\overset{+}{C}(CH_3)-CH_2Cl$



(2)

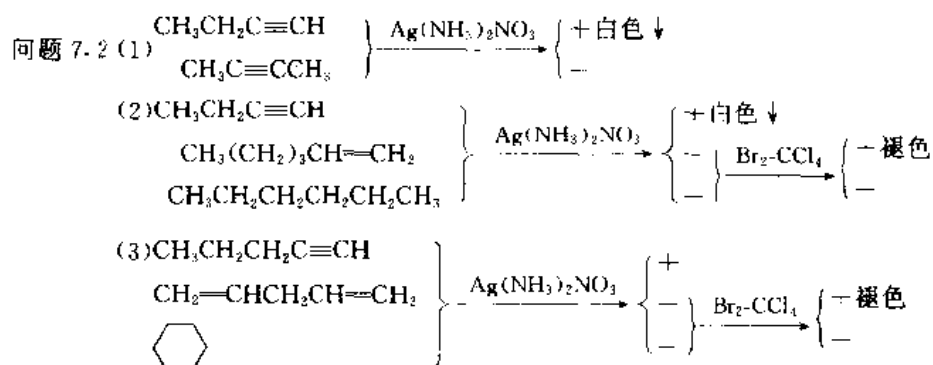




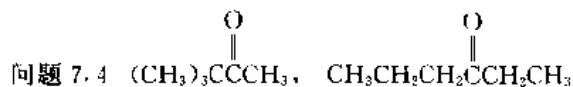
4. (1) i) NaOEt, NaOH ii) HBr, 过氧化物
 (2) i) Hg(OAc)₂, CH₃OH ii) NaBH₄
 (3) i) HBr, 过氧化物 ii) NaOCH₃, CH₃OH
 (4) i) O₃ ii) Zn + HOAc
 (5) i) NaOEt, EtOH ii) Br₂-H₂O
 (6) I₂, NaHCO₃

第七章 炔烃及二烯烃

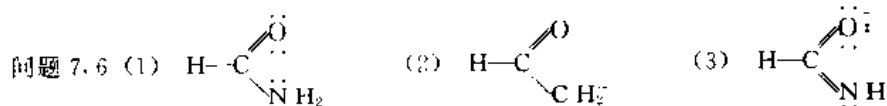
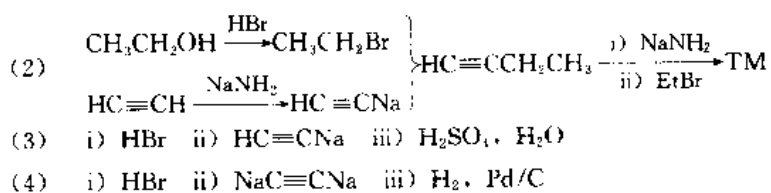
- 问题 7.1 (1) HC≡C(CH₂)₃CH₃ 1-己炔
 (2) CH₃C≡CCH₂CH₂CH₃ 2-己炔
 (3) CH₃CH₂C≡CCH₂CH₃ 3-己炔
 (4) HC≡CCH₂CH(CH₃)₂ 4-甲基-1-己炔
 (5) CH₃C≡CCH(CH₃)₂ 4-甲基-2-己炔
 (6) $\begin{array}{c} \text{HC} \equiv \text{CCHCH}_3 \\ | \\ \text{CH}_2\text{CH}_3 \end{array}$ 3-甲基-1-戊炔
 (7) HC≡CC(CH₃)₃ 3,3-二甲基丁炔



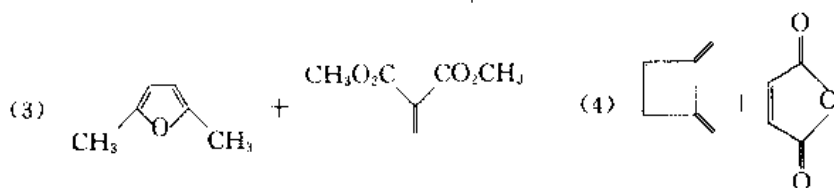
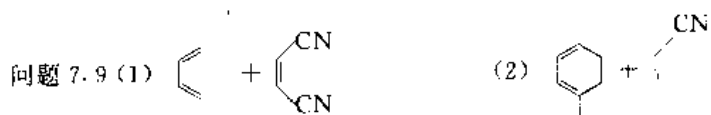
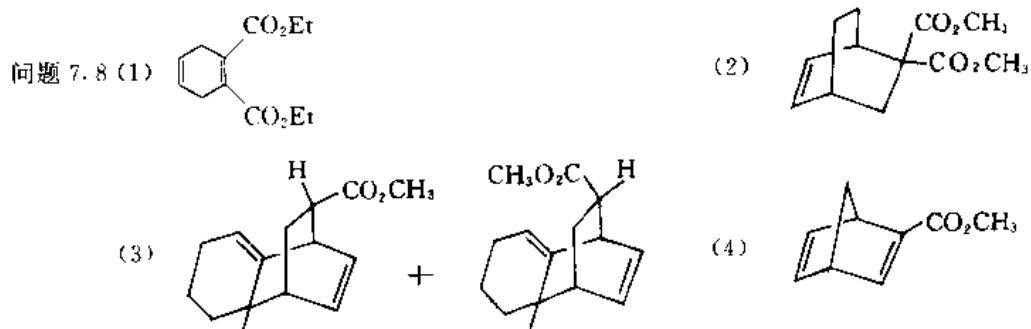
- 问题 7.3 C₅H₈ 炔烃的异构体有三个: (1) HC≡CCH₂CH₂CH₃ (2) CH₃C≡CCH₂CH₃ (3) HC≡CCH(CH₃)₂
 三个化合物中与溴反应最快的是(2)。



- 问题 7.5 (1) i) Br₂ ii) NaNH₂, NH₃(l)

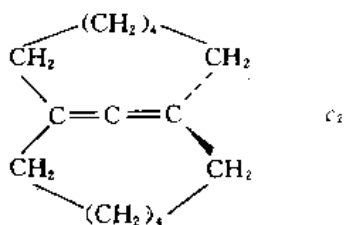
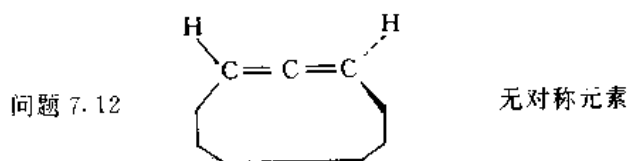


问题 7.7 (1)、(5) 是错的。

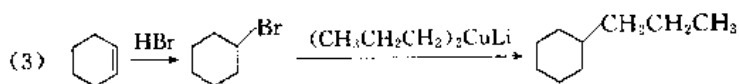
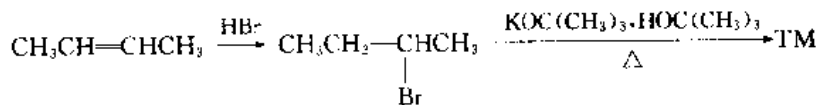
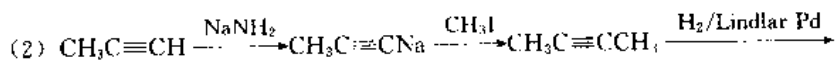


问题 7.10 1. 二苯基异苯并呋喃在 Diels-Alder 反应中具有较高的反应活性。
2. 邻位二溴化合物与 Mg 作用, 发生消去反应。

问题 7.11 (1) $2\sigma, 2C_2$ (2) 1σ , 无对称轴

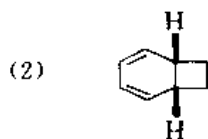
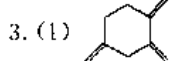
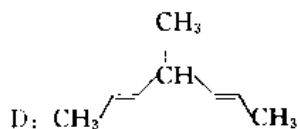
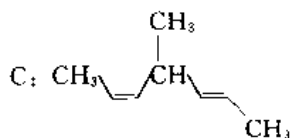
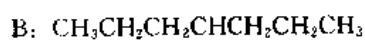
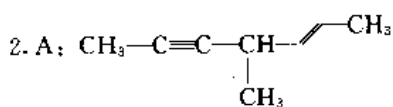


习题: 1. (1) i) $\text{H}_2\text{SO}_4, \text{H}_2\text{O}$ ii) $\text{NaOH}, \text{CH}_3\text{CH}_2\text{Br}$ 或者 i) $\text{Hg}(\text{OAc})_2, \text{EtOH}$ ii) NaBH_4

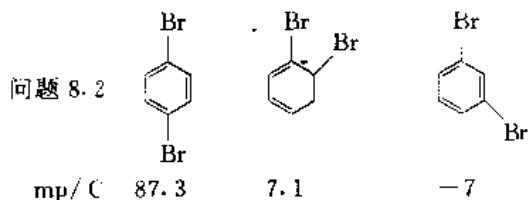
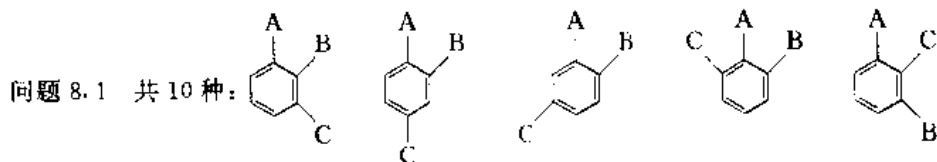


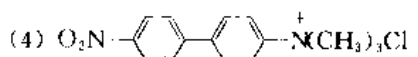
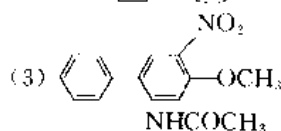
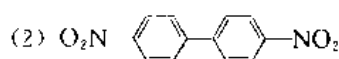
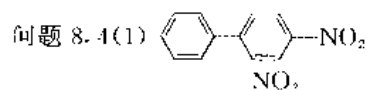
(4) i) NaNH_2 ii) $\text{CH}_2=\text{CHCH}_2\text{Cl}$ iii) $\text{H}_2, \text{Lindlar Pd}$

(5) i) NaNH_2 ii) $\text{CH}_3\text{CH}_2\text{CH}_2\text{Cl}$ iii) NaNH_2 iv) $\text{CH}_3(\text{CH}_2)_6\text{CH}_2\text{Cl}$ v) $\text{H}_2, \text{Lindlar Pd}$

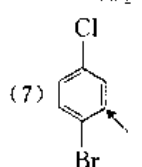
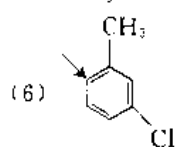
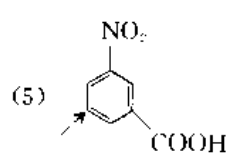
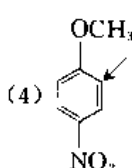
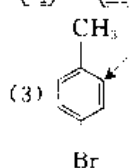
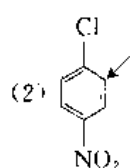
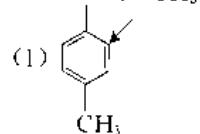


第八章 芳 烃

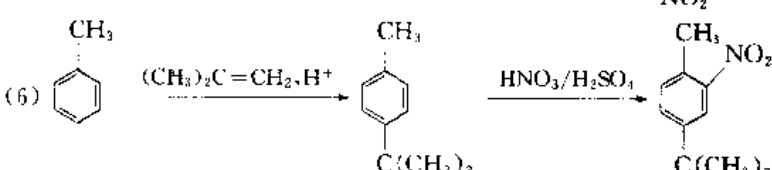
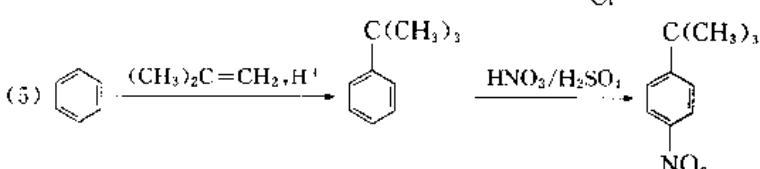
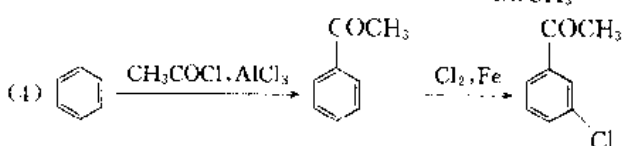
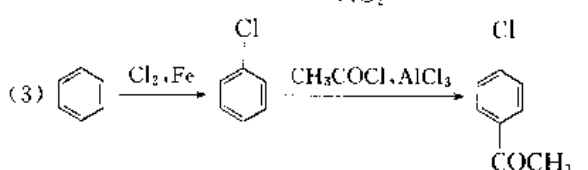
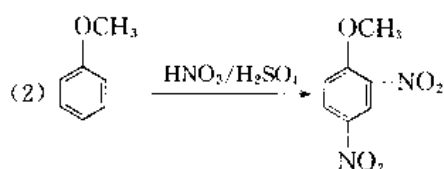
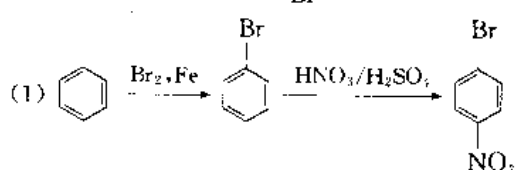




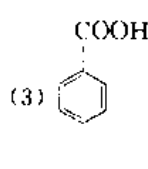
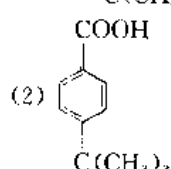
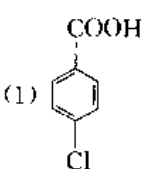
问题 8.5



问题 8.6



问题 8.7



问题 8.8

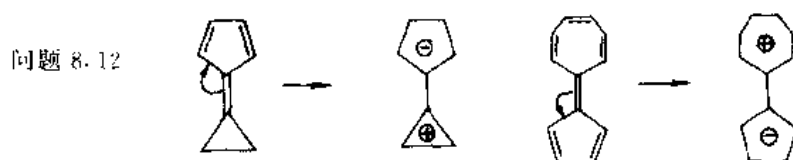
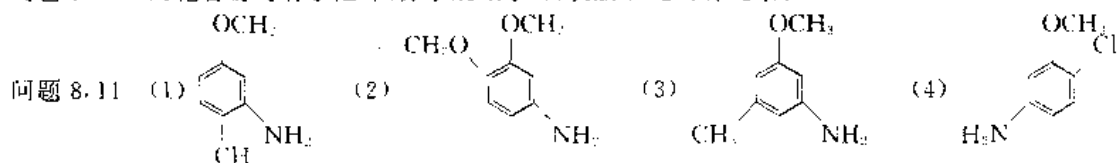
(1)有手性 (2)有手性 (3)有手性 (4)无手性

问题 8.9

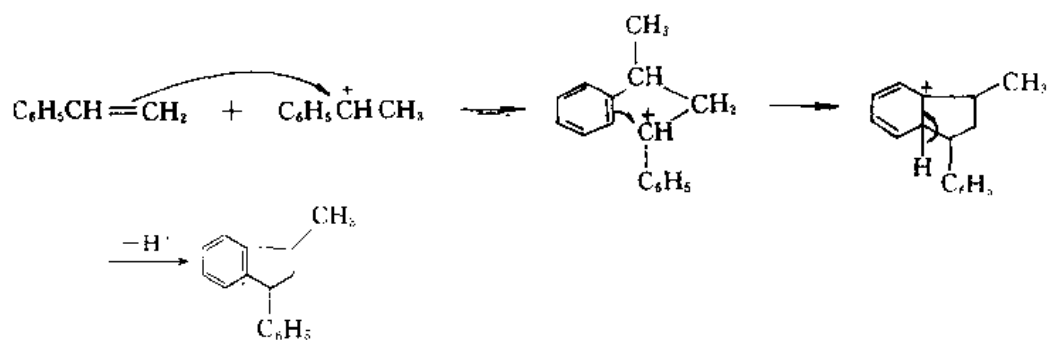
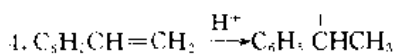
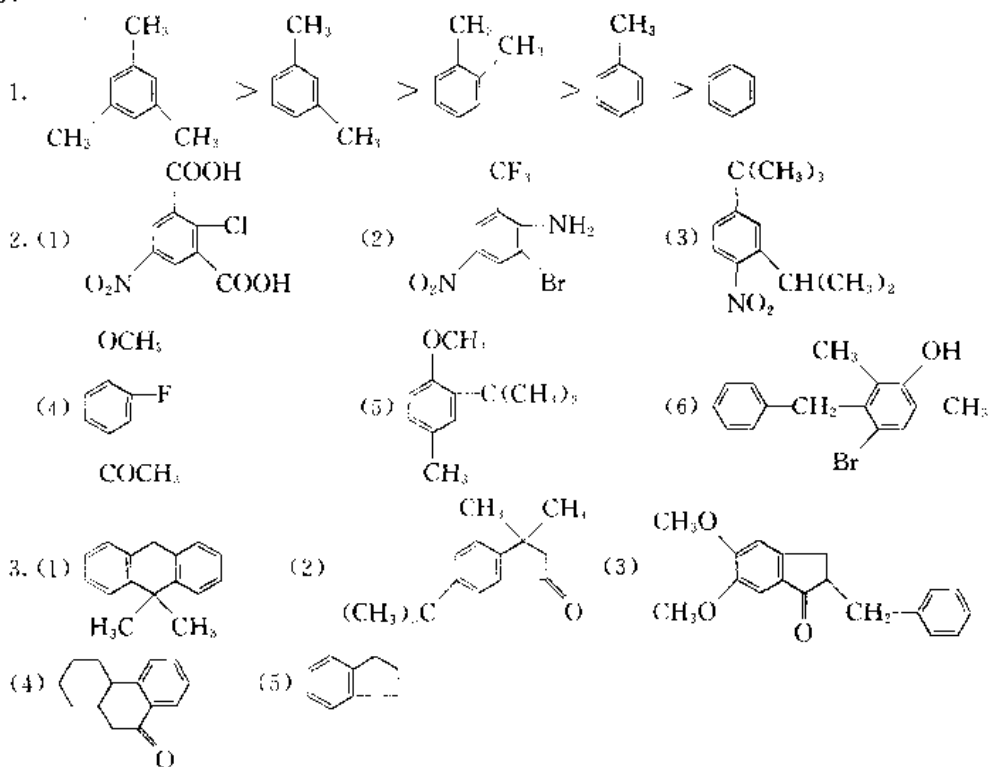
化合物 1 和 2 比较,由于 1 中苯环上有较大的取代基,当芳环旋转时,因醚环较小而受阻,分子可以拆分成对映体。化合物 2 和 3 比较,由于 3 中醚环较短,也使芳环旋转受阻,分子可拆分成对映体。而在 2 中由

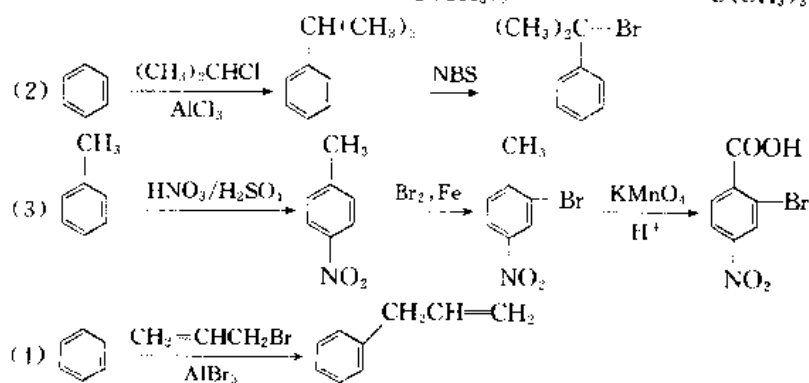
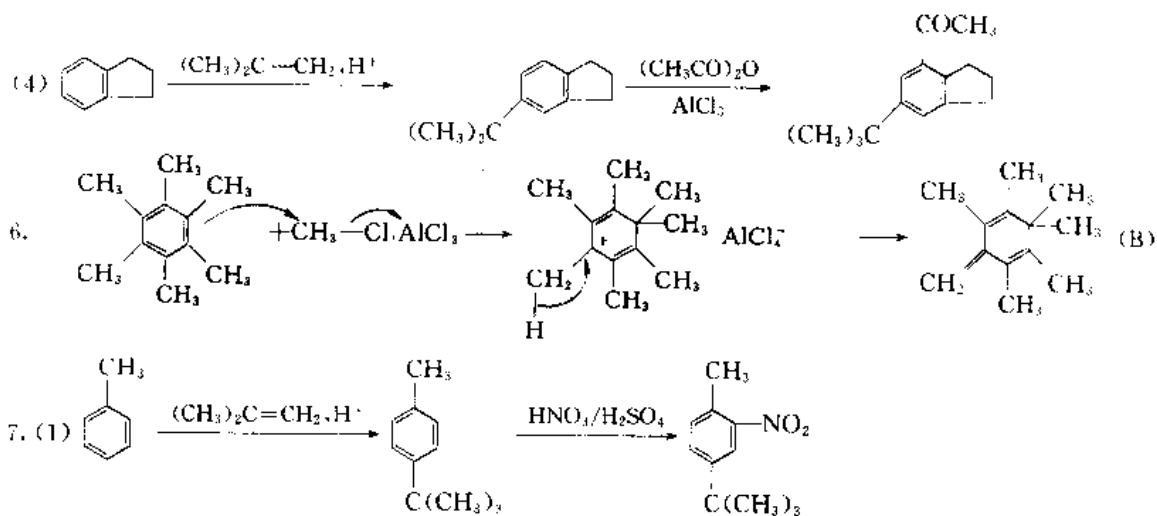
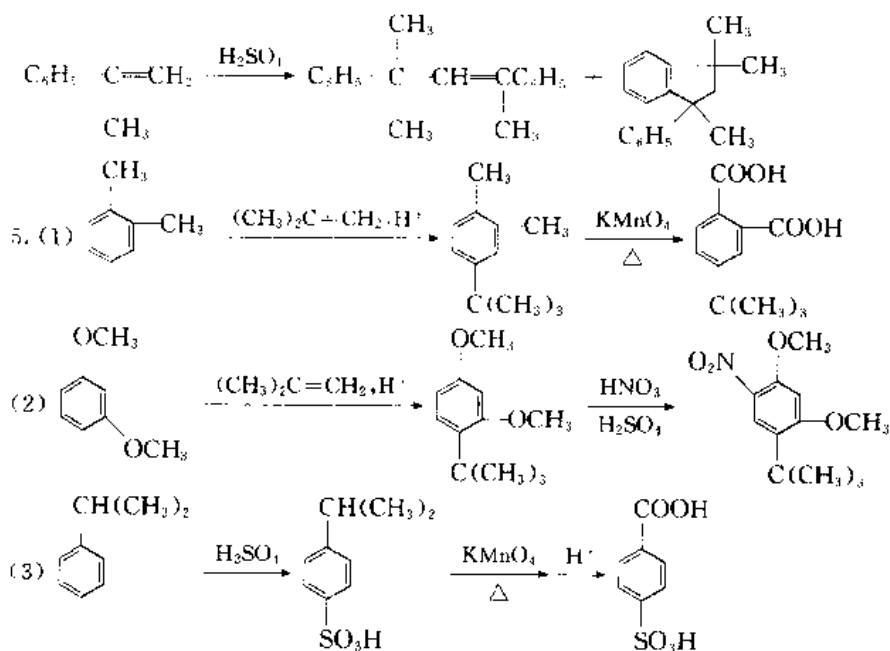
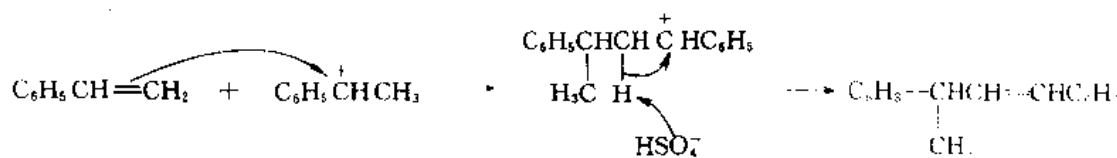
于取代基较小,醚环较长,芳环旋转时,不受醚环的阻碍,故不可拆分。

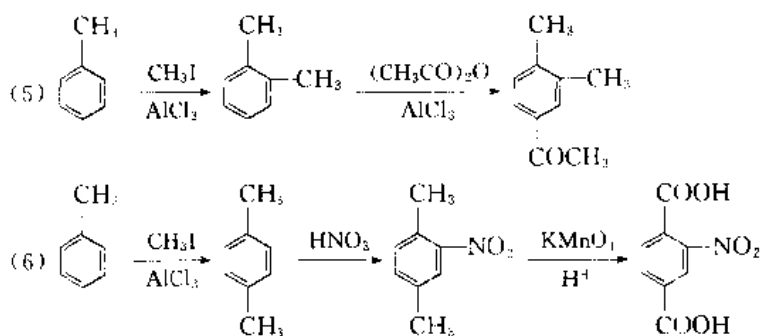
问题 8.10 两化合物均有手性,因分子发生了环的扭曲,无对称元素。



习题:







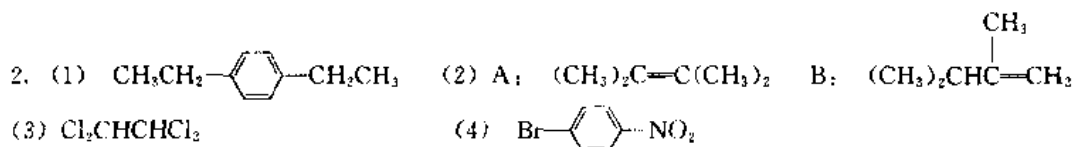
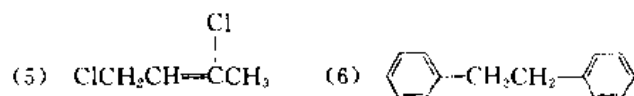
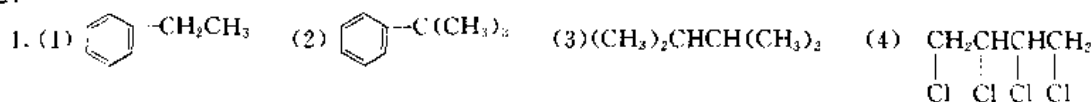
第九章 核磁共振谱、红外光谱和质谱

问题9.1 (1)4组 (2)2组 (3)2组 (4)3组 (5)1组 (6)4组 (7)3组 (8)1组 (9)1组 (10)1组
(11)4组 (12)4组

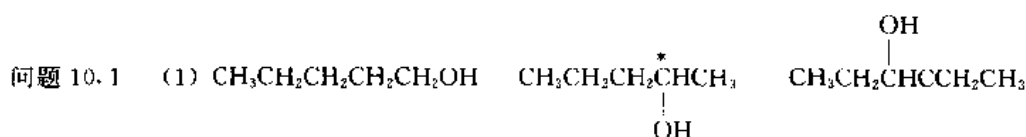
问题9.2 (1) $(\text{CH}_3)_3\text{C}-\text{C}(\text{CH}_3)_3$ (2)  (3)  (4) $(\text{CH}_3)_3\text{CBr}$ (5) $\text{ClCH}_2\text{CH}_2\text{Cl}$ (6) CH_3CCl_3
(7) $(\text{ClCH}_2)_4\text{C}$

问题9.3 (1) $(\text{CH}_3)_2\text{CHCH}_2\text{Cl}$ (2) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{Cl}$ (3) 

习题:



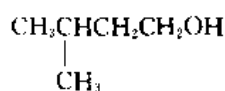
第十章 醇 和 酚



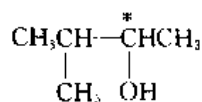
戊醇

(R) 或 (S) -2-戊醇

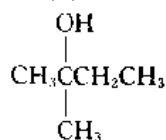
3-戊醇



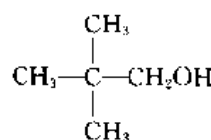
3-甲基-1-丁醇



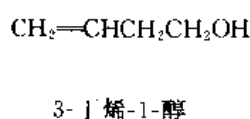
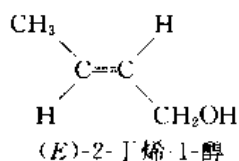
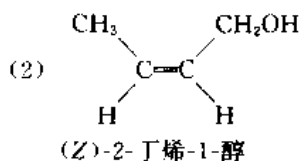
(R)或(S)-3-甲基-2-丁醇

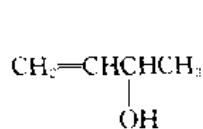


2-甲基-2-丁醇

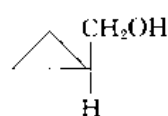


2,2-二甲基丙醇

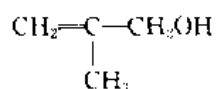




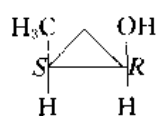
1-丁烯-3-醇



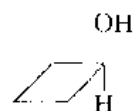
环丙基甲醇



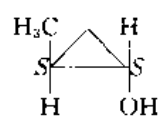
2-甲基-2-丙烯-1-醇



顺-2-甲基环丙醇 (±)



环丁醇



反-2-甲基环丙醇 (±)

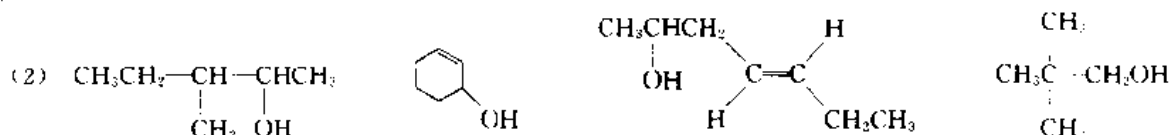
问题 10.2 见问题 10.1

问题 10.3 (1) 5-甲基己醇

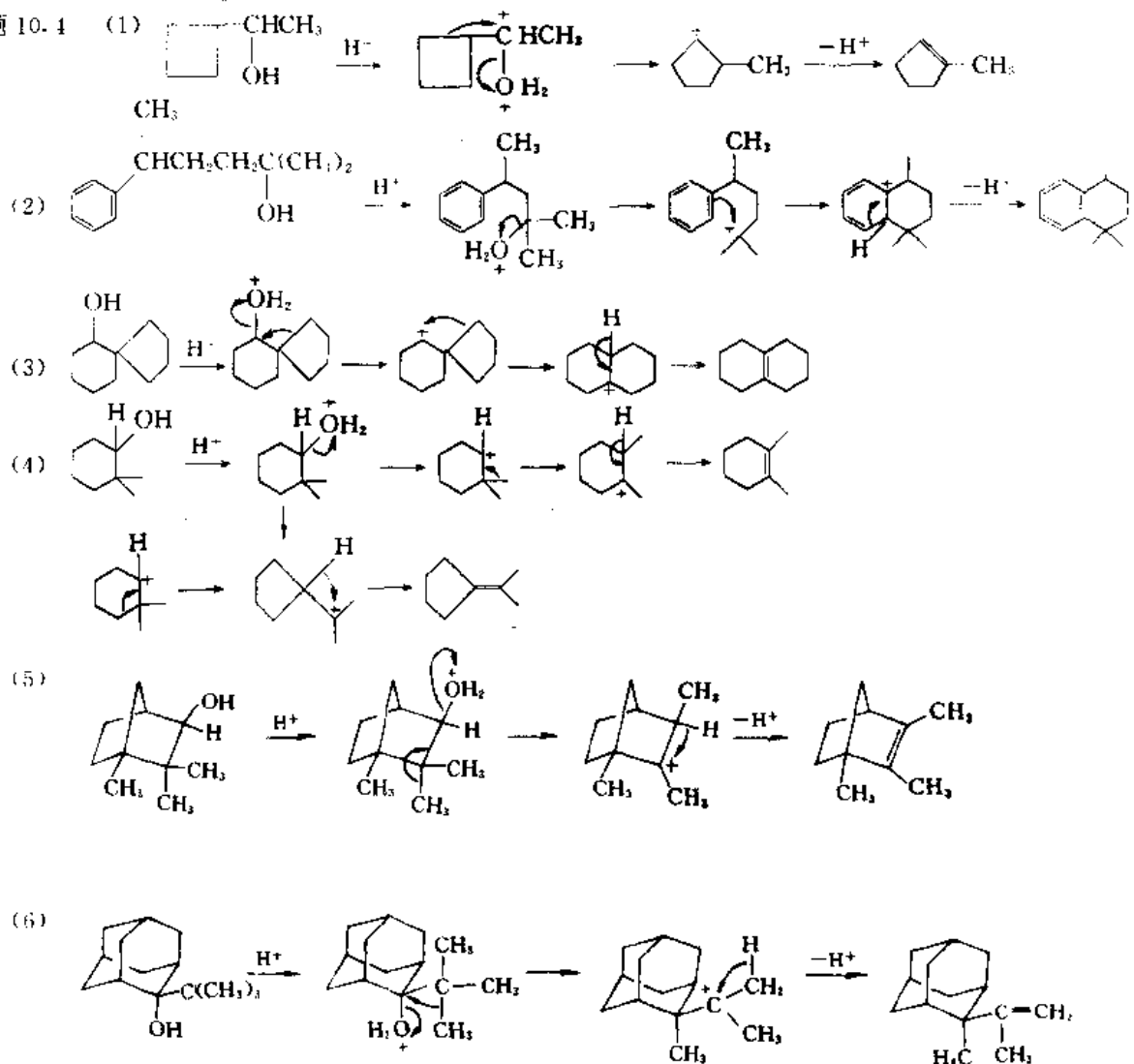
三苯甲醇

2,4-二甲基-1-戊醇

4-苯基-1,6-庚二烯-4-醇



问题 10.4

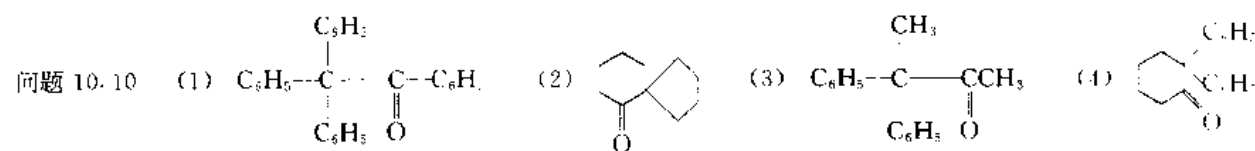
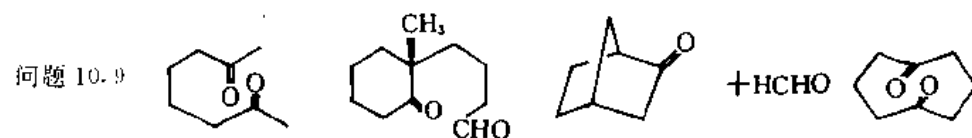
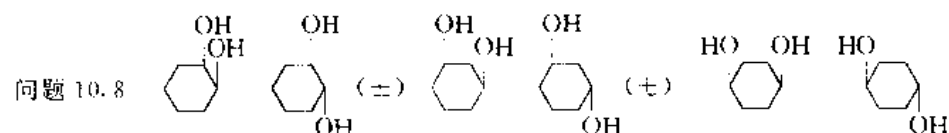
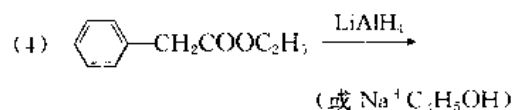
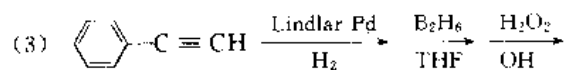
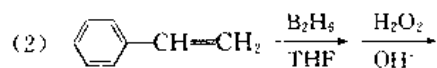
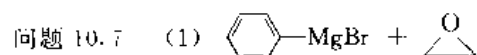
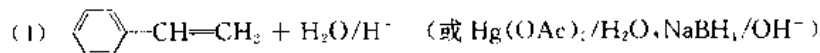
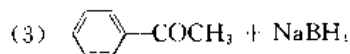
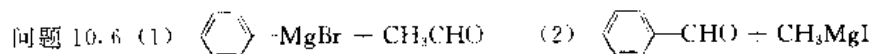
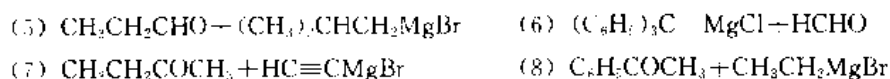


问题 10.5 (1) $\text{C}_6\text{H}_5\text{CHO} + \text{CH}_3\text{CH}_2\text{MgX}$

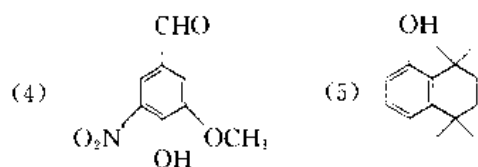
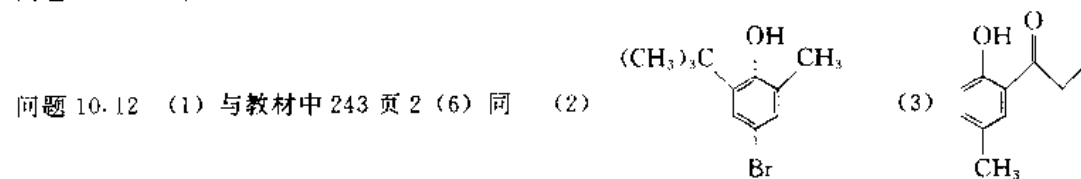
(2) $\text{CH}_3\text{COCH}_3 + \text{C}_4\text{H}_9\text{MgBr}$

(3) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{CH}_3\text{CH}_2\text{MgBr}$

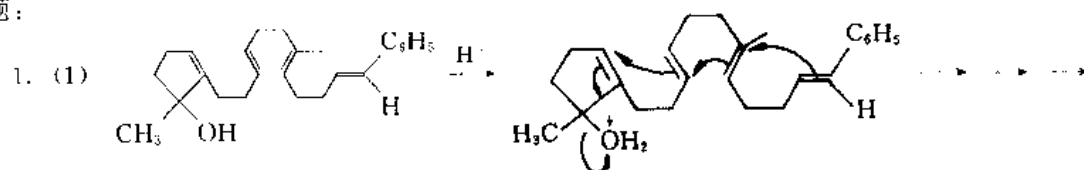
(4) $\text{CH}_3\text{COOC}_2\text{H}_5 + \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{MgBr}$

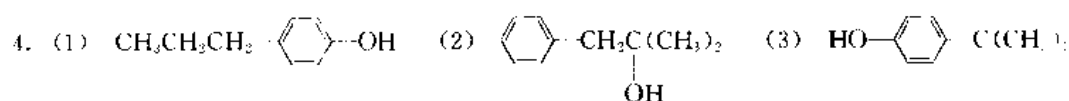
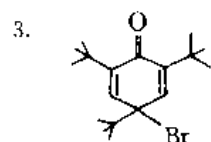
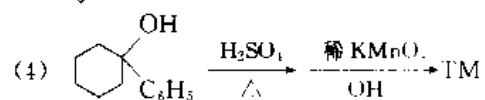
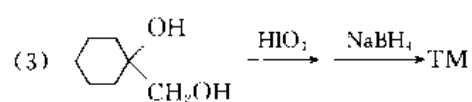
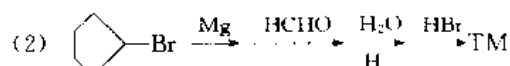
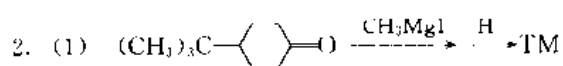
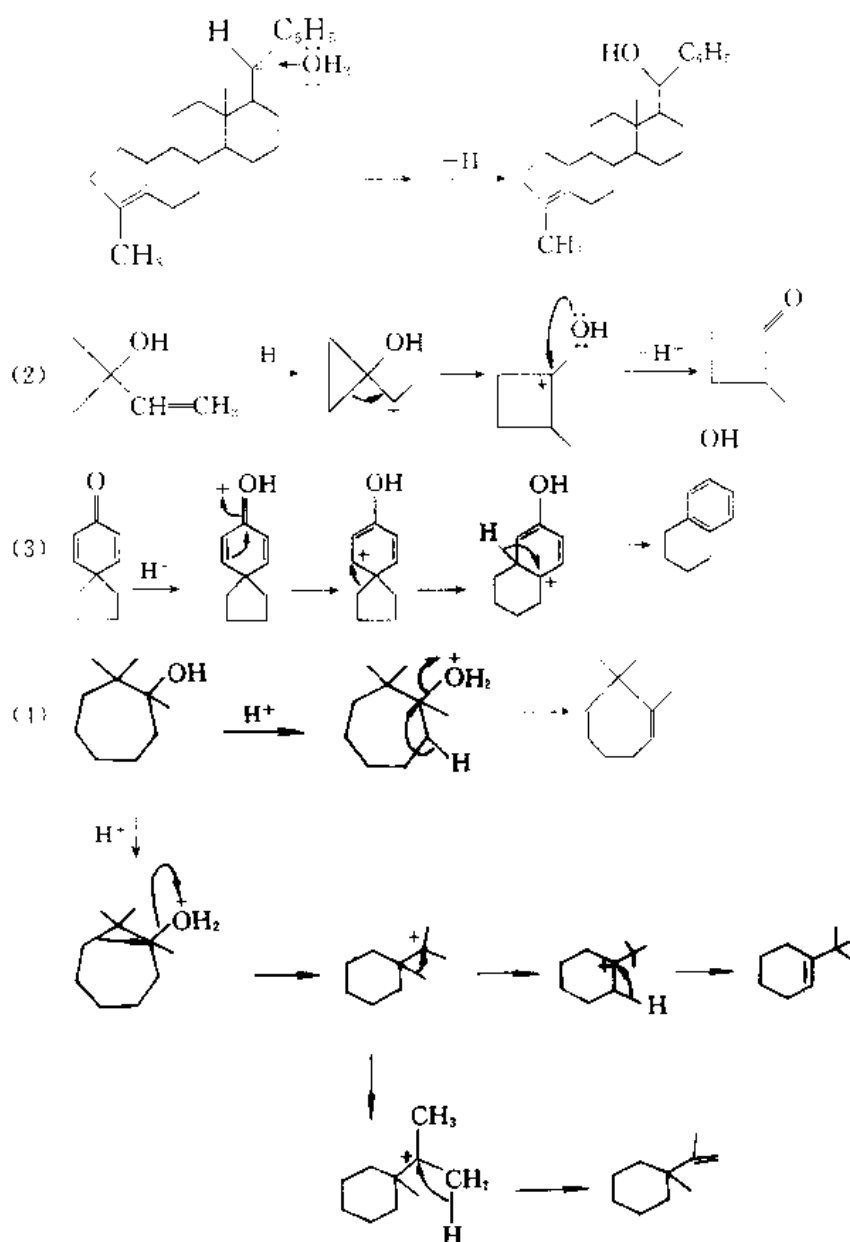


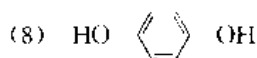
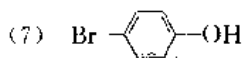
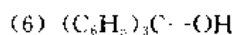
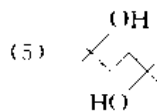
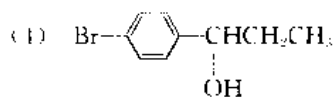
问题 10.11 同 NaOH 分离后再纯化。



习题:







第十一章 醚

问题 11.1 (1) 乙基环己基醚

(2) 乙基仲丁基醚

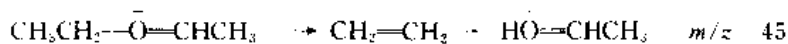
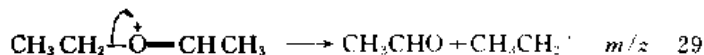
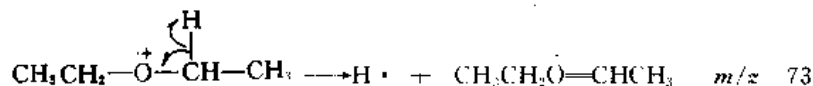
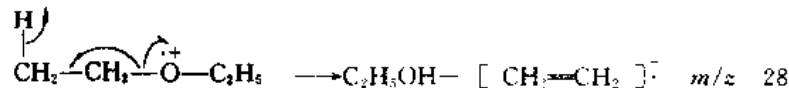
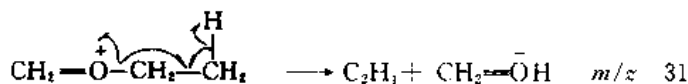
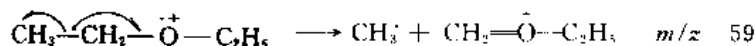
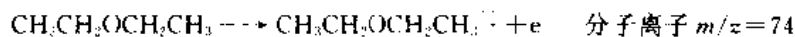
(3) 2-乙氧基乙醇

(4) 对硝基苯甲醚

问题 11.2	CH_3OCH_3	$C_2H_5OC_2H_5$	$CH_3OCH_2CH_2OCH_3$	$C_2H_5OCH_2CH_2OC_2H_5$
	24.9°C	34.6°C	83°C	123.5°C
	$CH_3CH_2CH_3$	$CH_3(CH_2)_3CH_3$	$CH_3(CH_2)_5CH_3$	$CH_3(CH_2)_7CH_3$
	-42.2°C	36.1°C	68.7°C	125.6°C

问题 11.3 $CH_3CH_2OCH_2CH_3$

碎片形成过程:



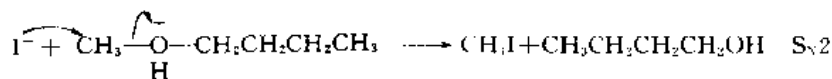
问题 11.4 (1) $CH_3Br + (CH_3)_2CCH_2CH_3$

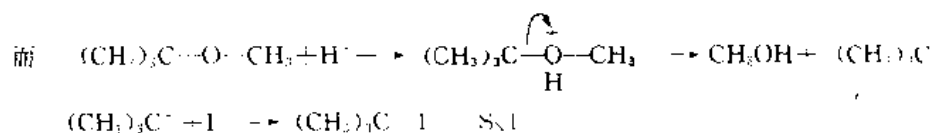
(2) $t\text{-C}_4\text{H}_9\text{I} + s\text{-C}_4\text{H}_9\text{OH}$

(3) $CH_3O-\text{C}_6\text{H}_4-\text{CH}_3 + CH_3CH_2OH$

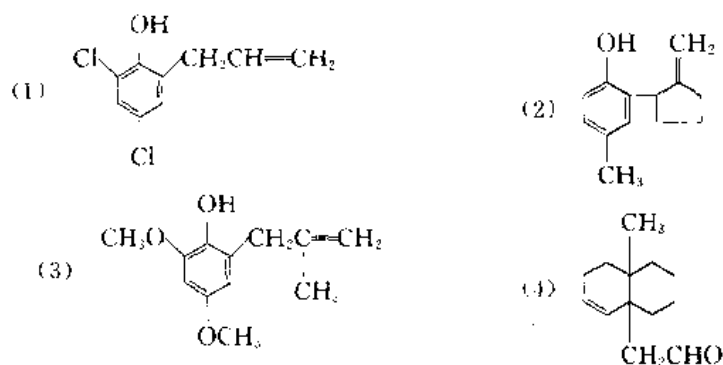
(4) $C_6H_5(CH_2)_4CH_2OH$

问题 11.5 $CH_3OCH_2CH_2CH_2CH_3 + H^+ \longrightarrow CH_3\overset{H}{\underset{|}{O}}CH_2CH_2CH_2CH_3$

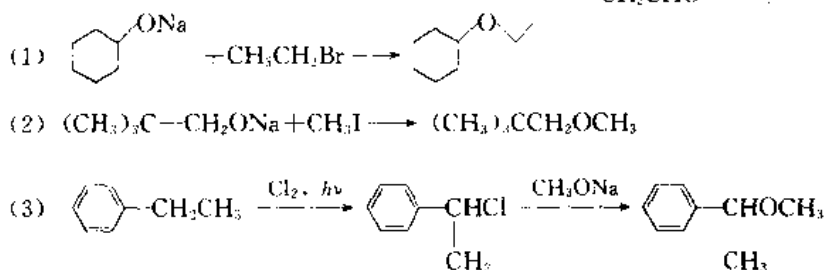




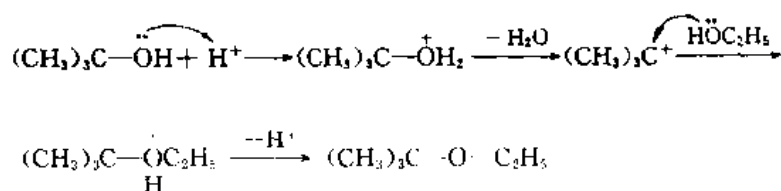
问题 11.6



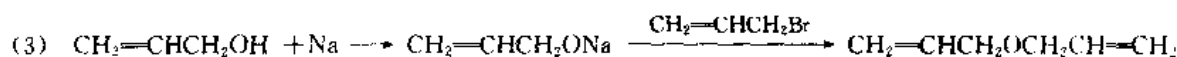
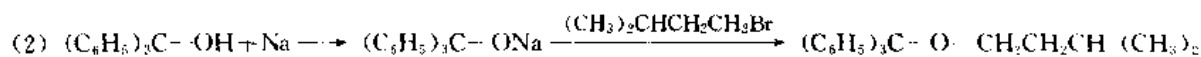
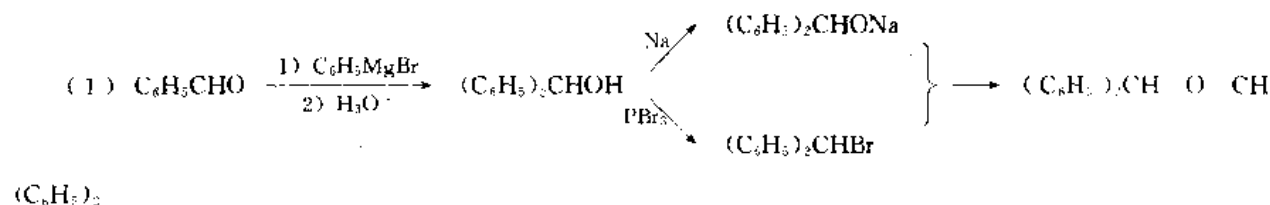
问题 11.7



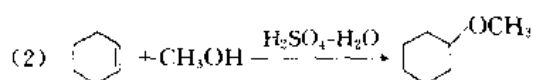
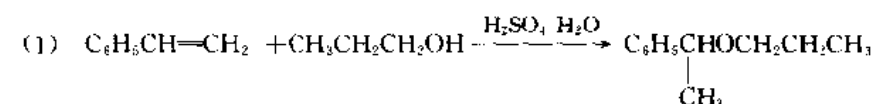
问题 11.8

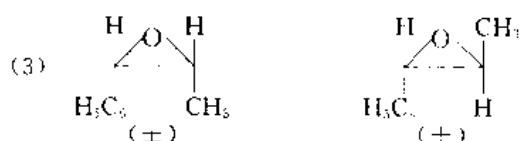
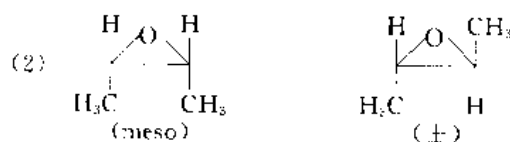
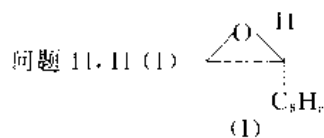
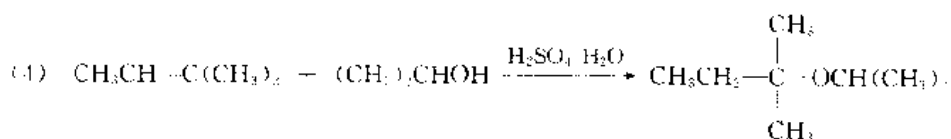
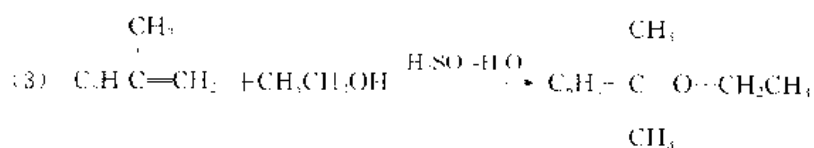


问题 11.9

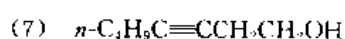
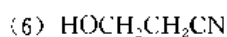
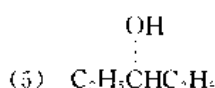
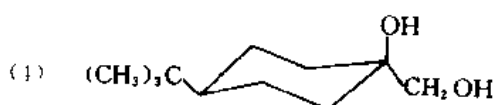
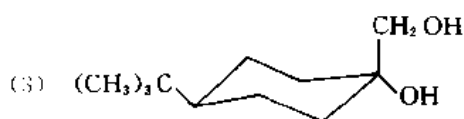
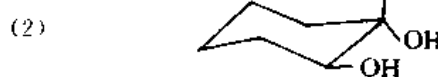
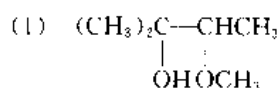


问题 11.10



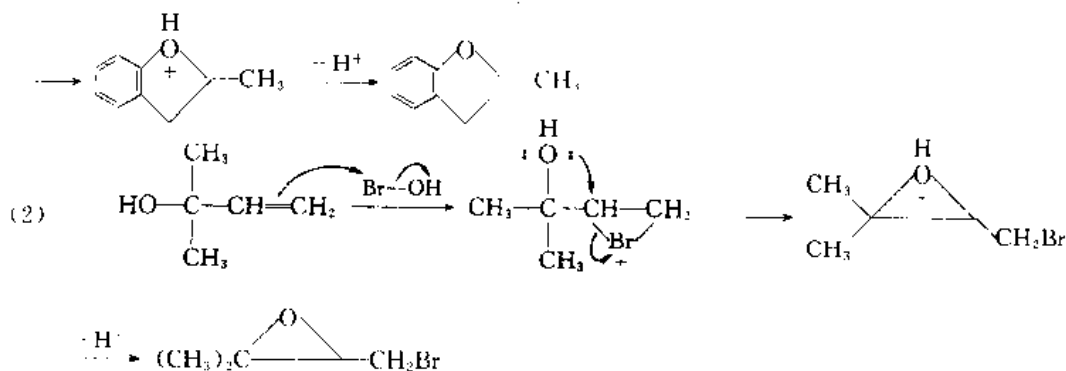
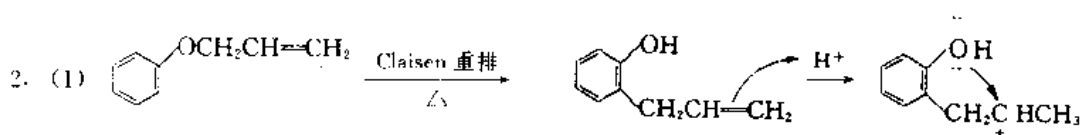


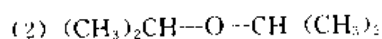
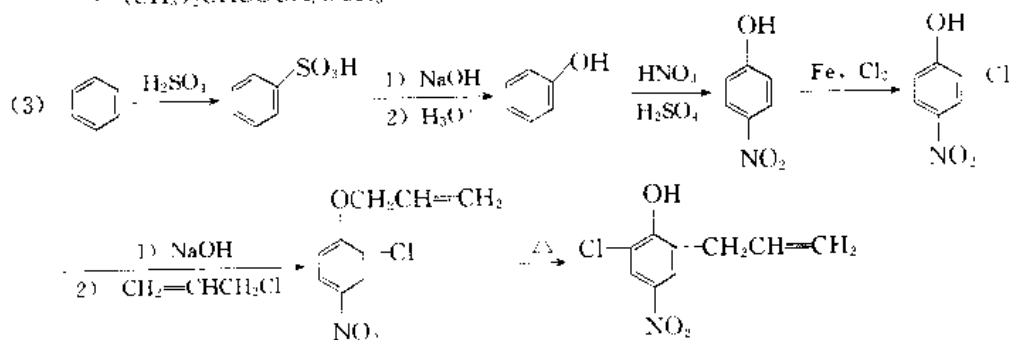
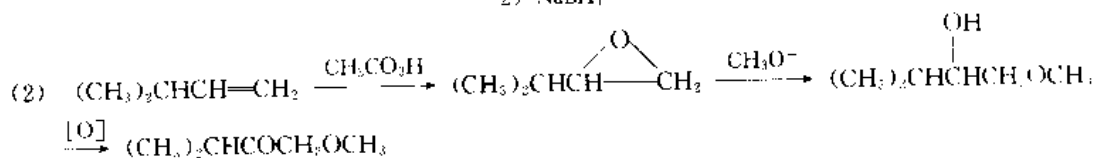
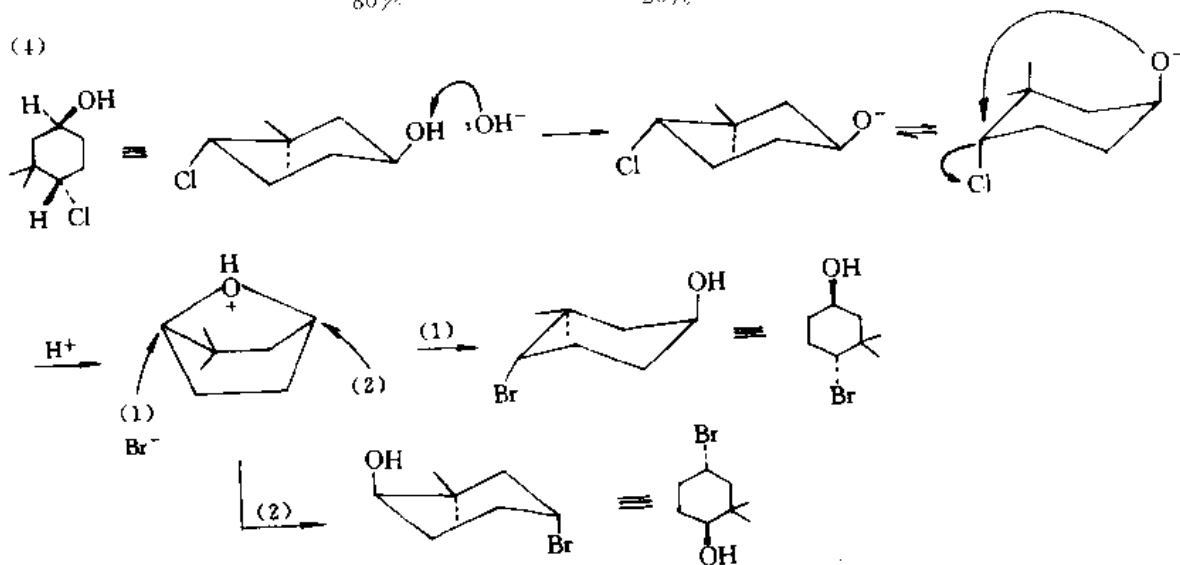
问题 11.12

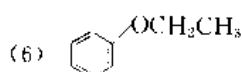
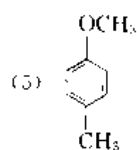
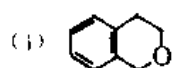
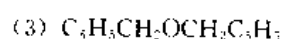


习题:

1. (1) > (2) > (3) > (4) > (5)







第十二章 醛 酮

问题 12.1 (1) 壬醛 (2) 2-庚酮 (3) 4-苯基-2-丁酮 (4) 3-甲基环十七酮

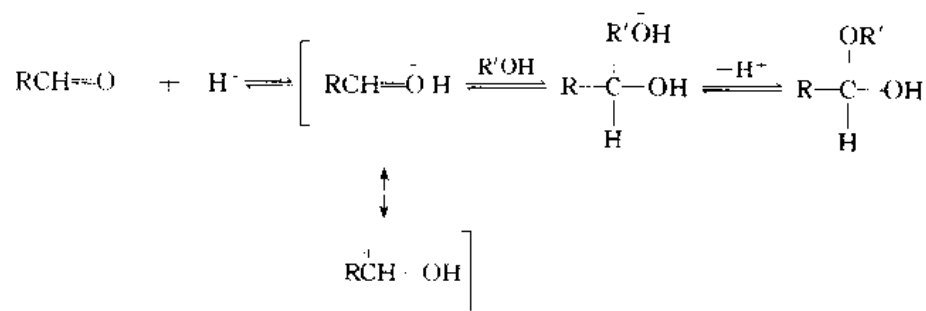
问题 12.2 (1) $CH_3COCH_2CH_2Br < CH_3COCH_2Br$

(2) $CH_3COCOCOCCH_3 > CH_3COCOCCH_3 > CH_3COCH_2CH_3$

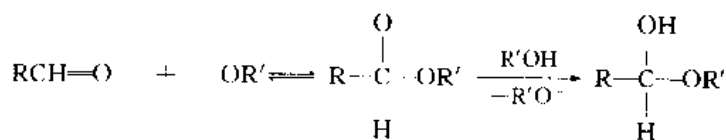
(3) $O_2N-C_6H_4-CHO > CH_3O-C_6H_4-CHO$

(4)

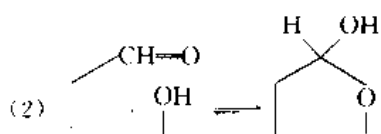
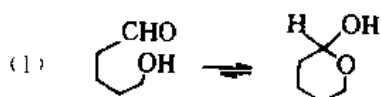
问题 12.3 酸催化



碱催化

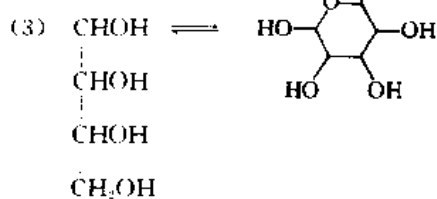


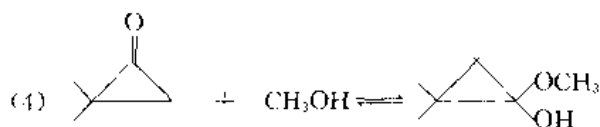
问题 12.4



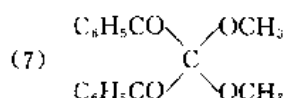
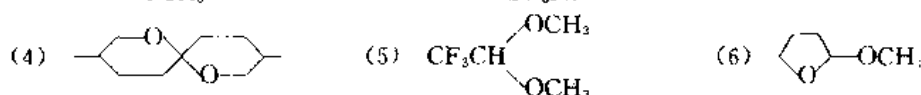
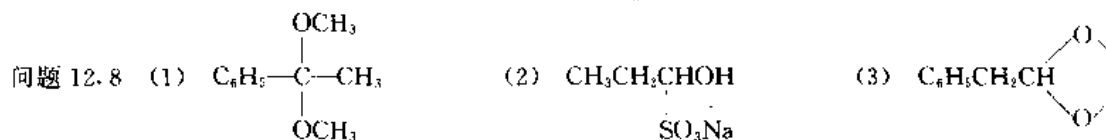
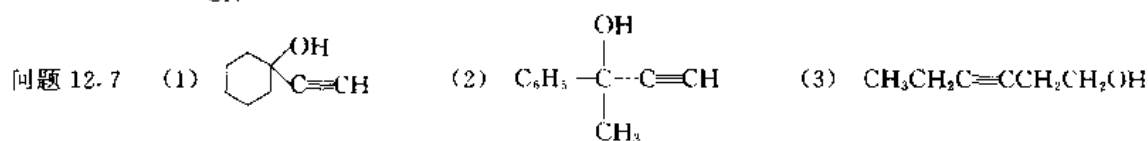
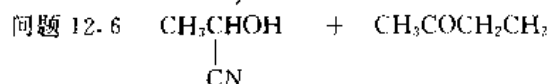
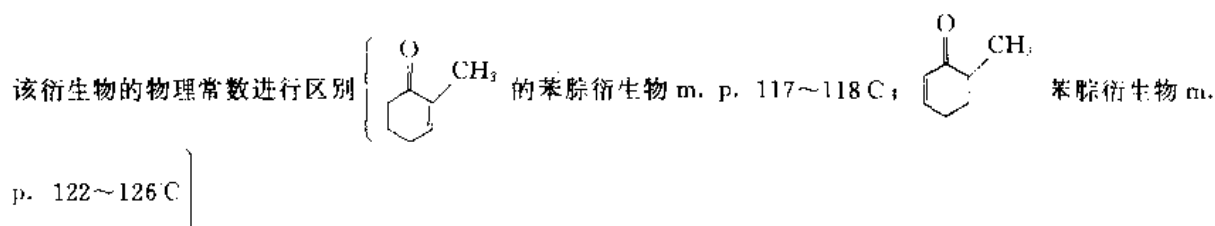
CHO

CHOH

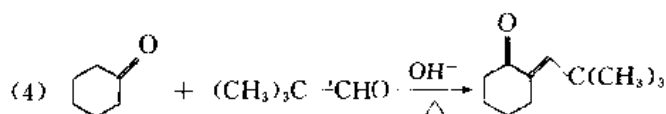
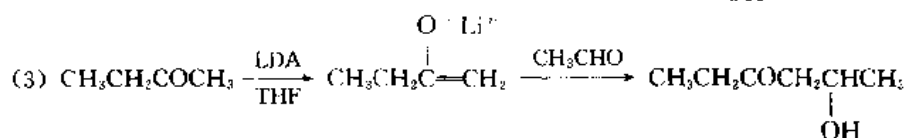
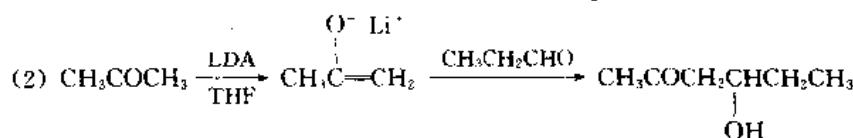
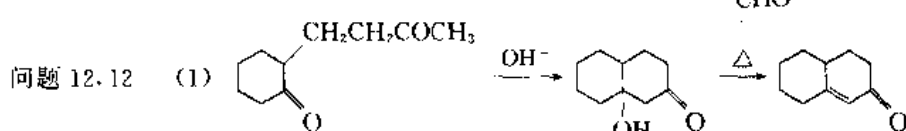
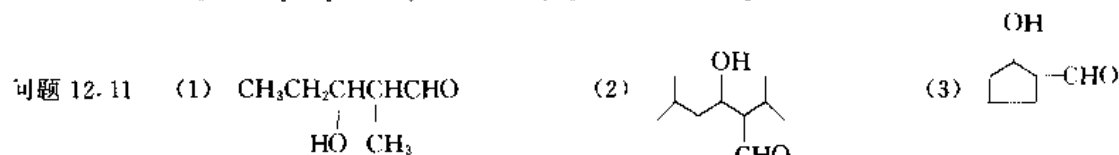
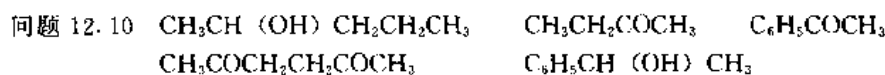


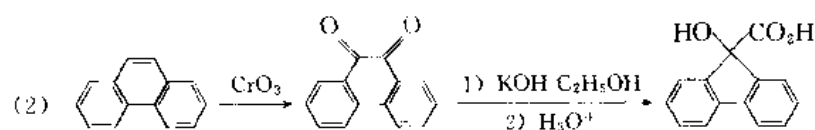
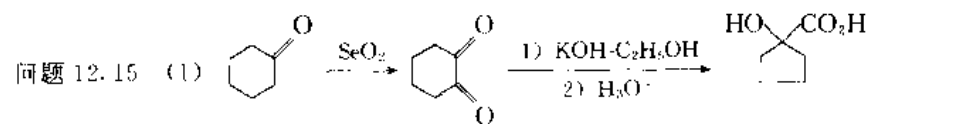
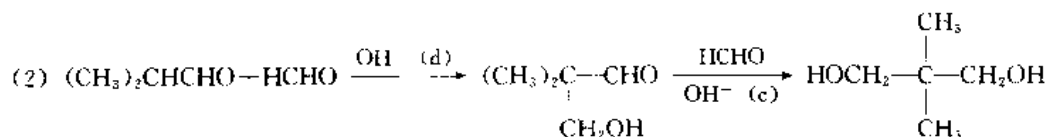
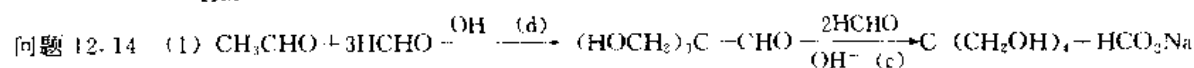
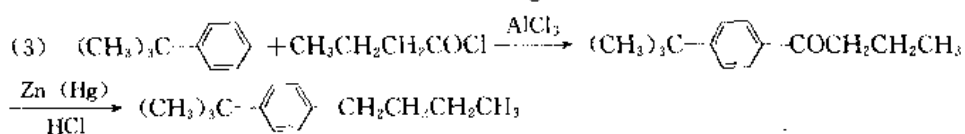
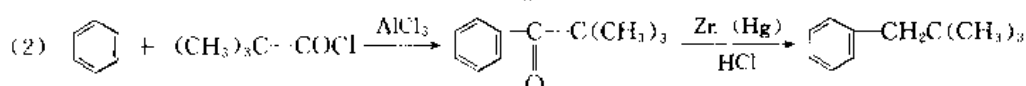
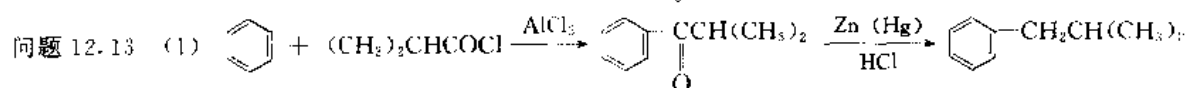
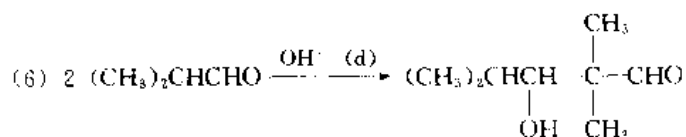
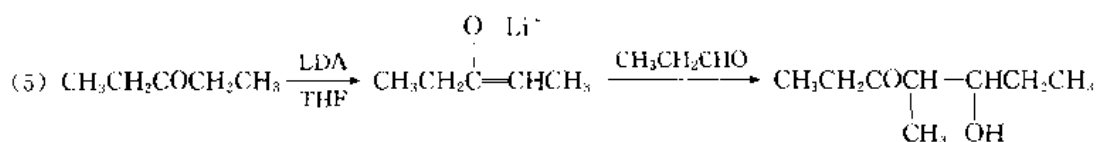


问题 12.5 根据¹H NMR 光谱, δ_H 不同; 或制备其衍生物 (如与 2, 4-二硝基苯肼反应生成苯腙衍生物), 测定

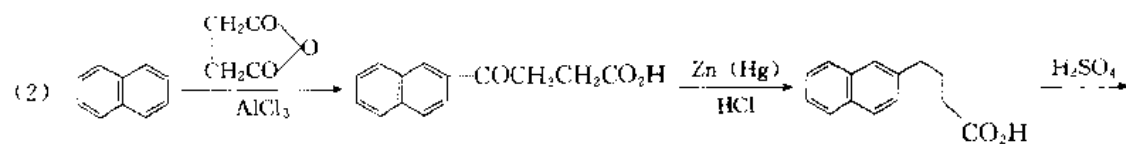
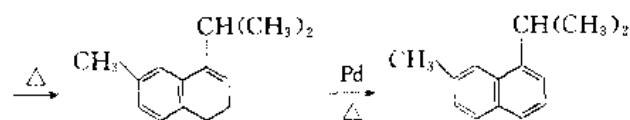
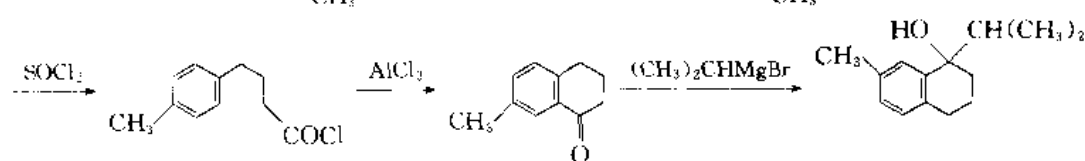


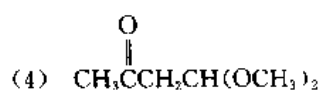
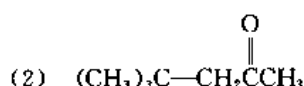
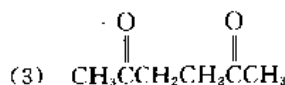
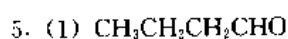
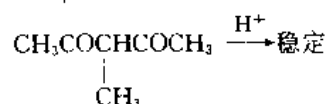
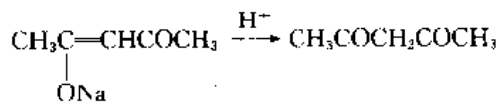
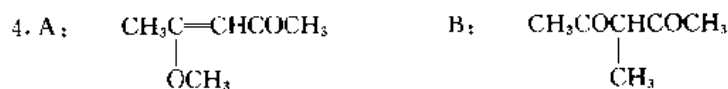
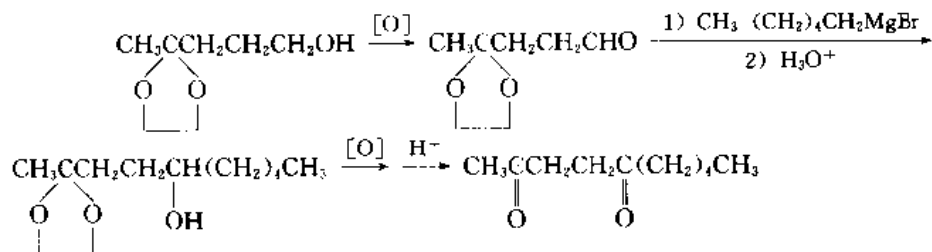
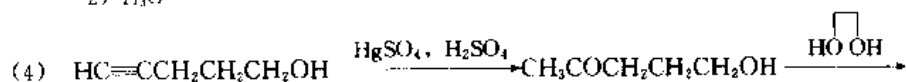
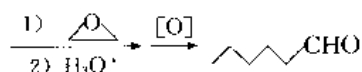
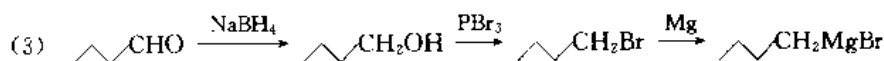
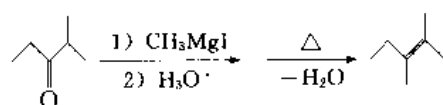
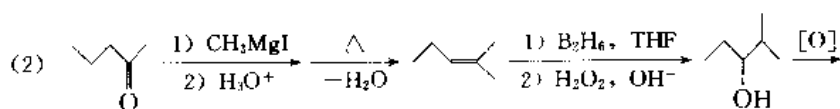
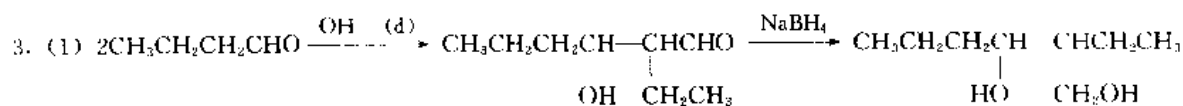
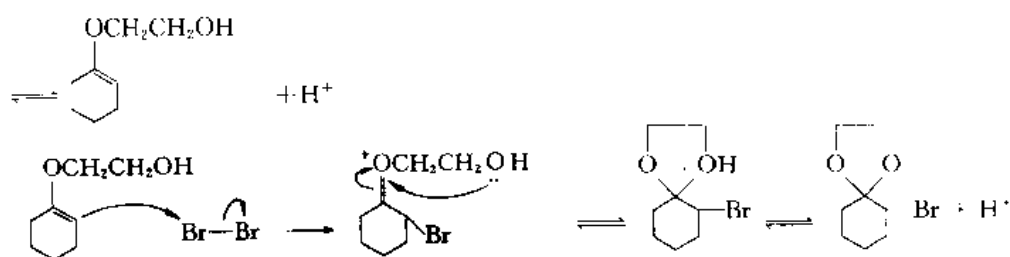
问题 12.9 (1) (2) (4) 会发生外消旋化。

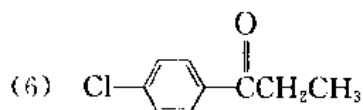
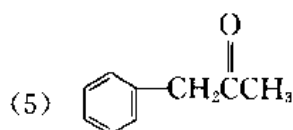




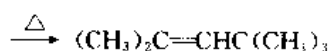
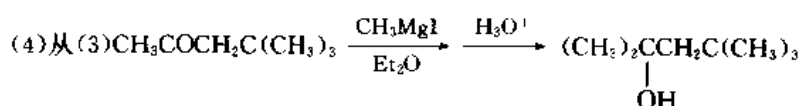
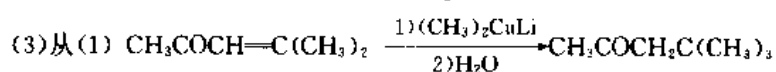
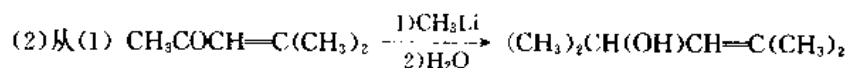
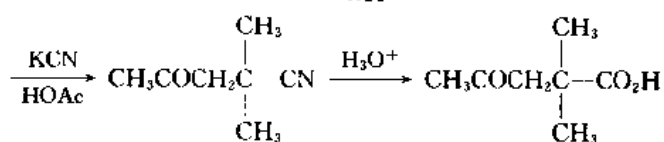
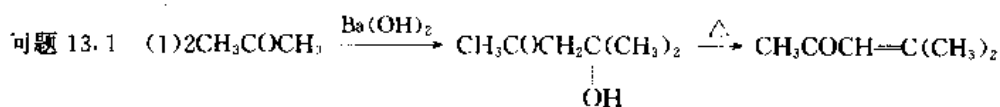
习题:



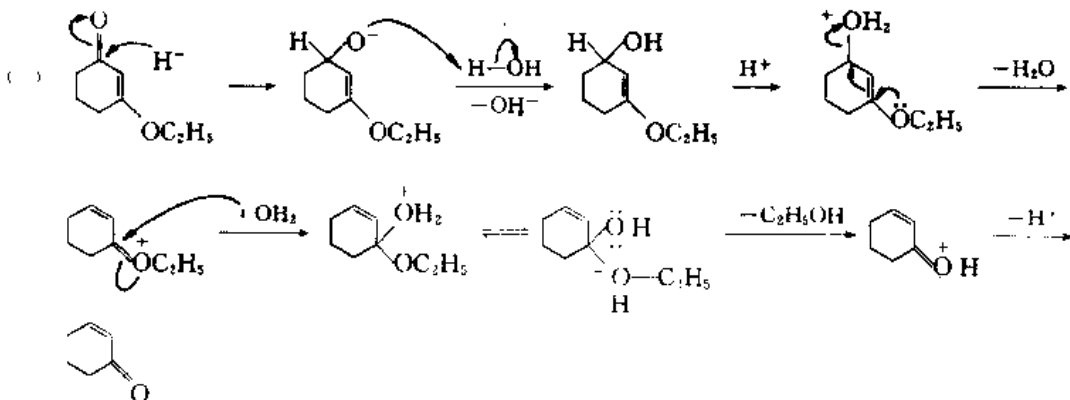
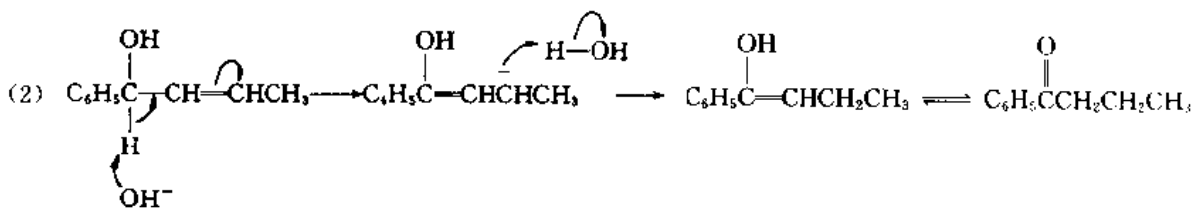
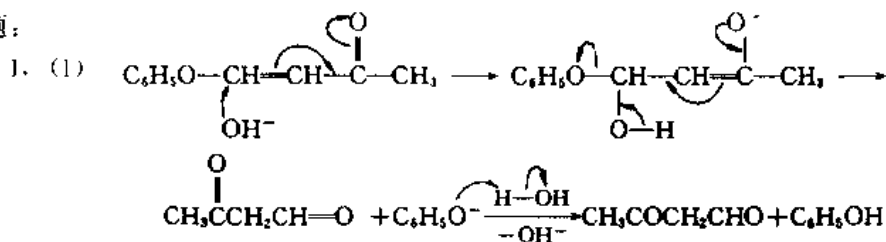


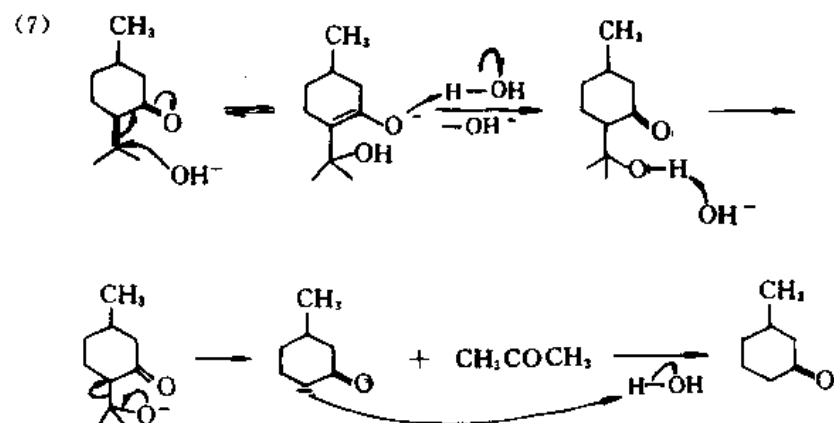
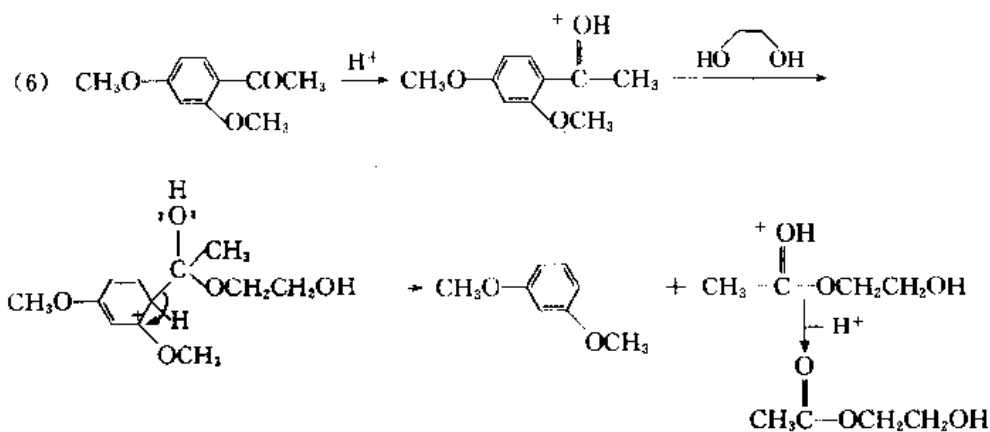
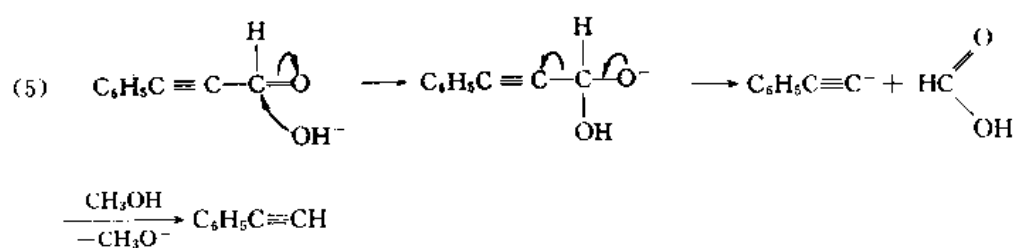
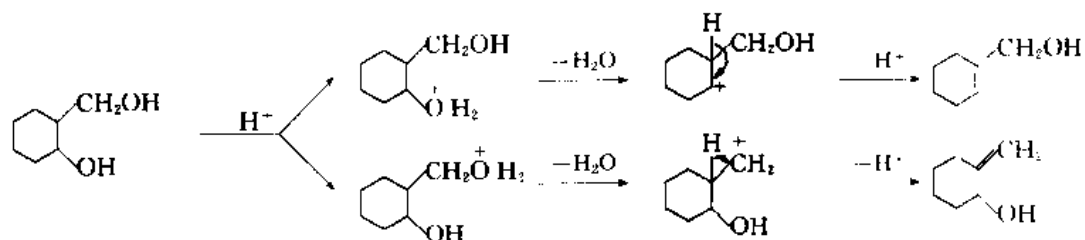
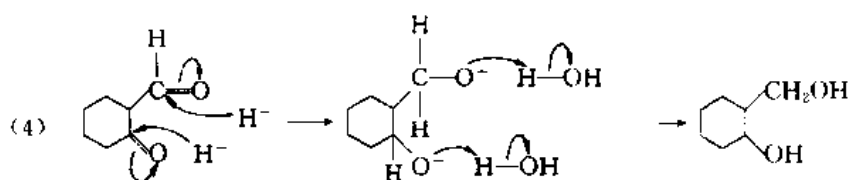


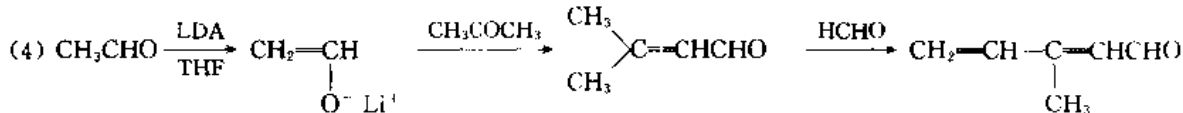
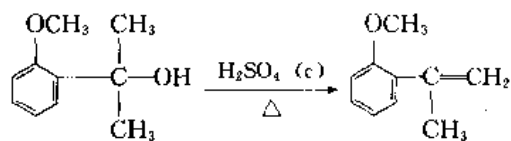
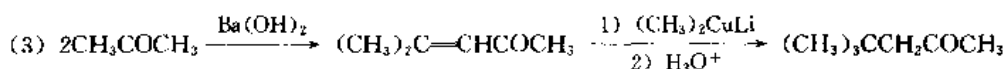
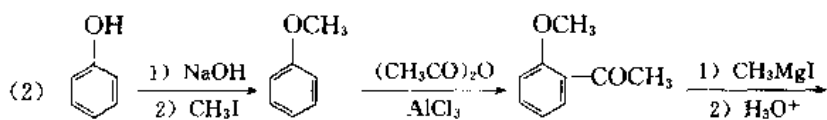
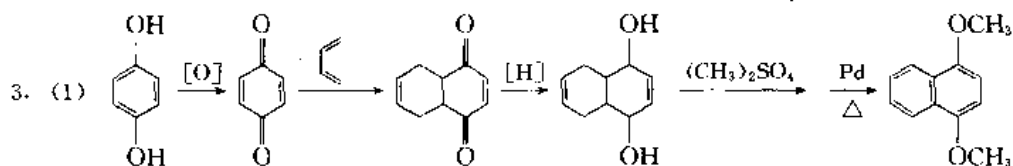
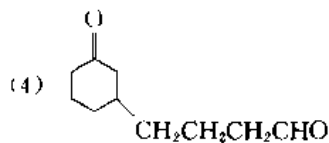
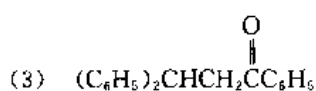
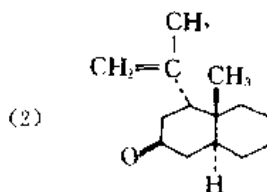
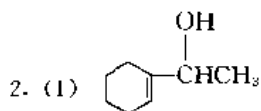
第十三章 不饱和醛酮及取代醛酮



习题:







第十四章 羧 酸

问题 14.1 己酸

4-甲基戊酸

3-甲基戊酸

2-甲基戊酸

3,3-二甲基丁酸

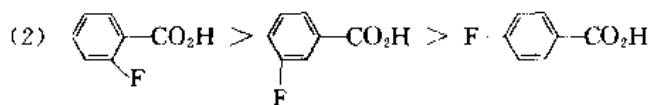
2,2-二甲基丁酸

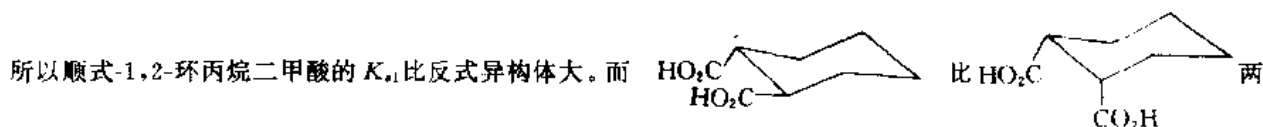
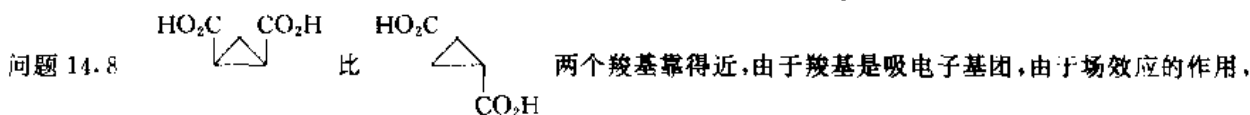
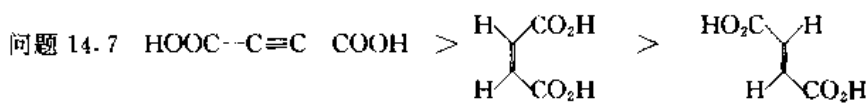
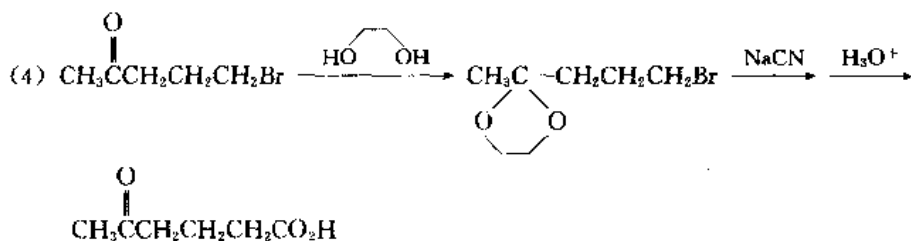
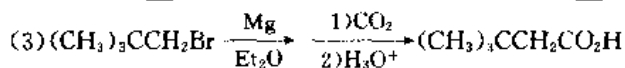
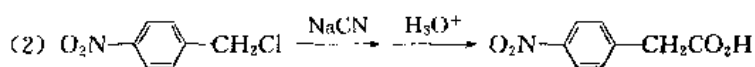
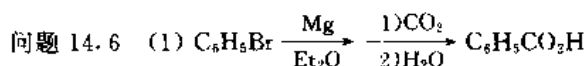
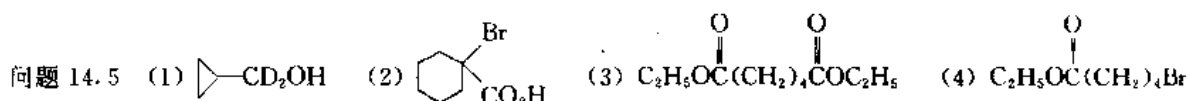
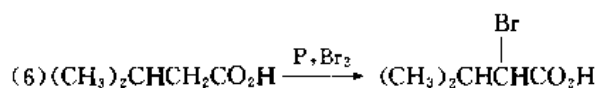
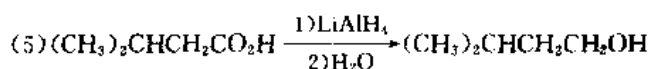
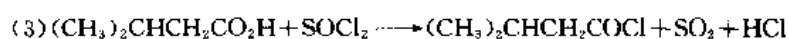
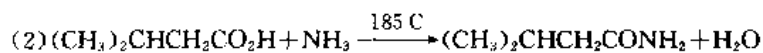
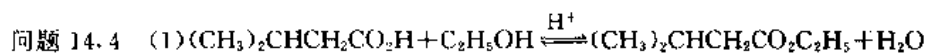
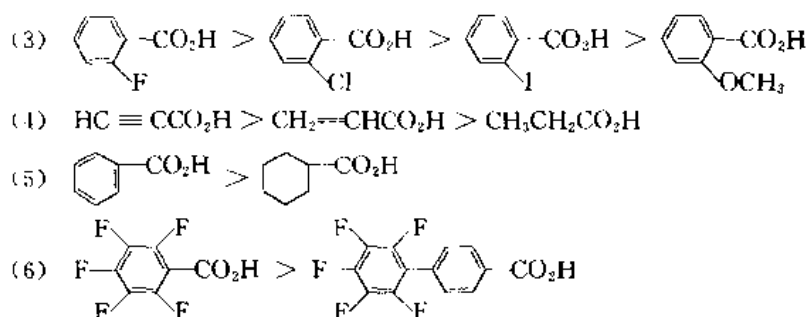
2,3-二甲基丁酸

2-乙基丁酸

问题 14.2 2-甲基戊酸、2,3-二甲基丁酸和 3-甲基戊酸有对映异构体。

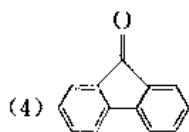
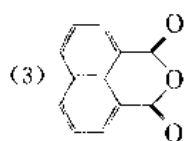
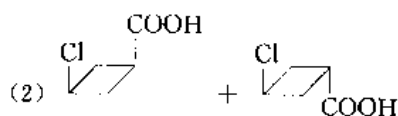
问题 14.3 (1) $\text{CF}_3\text{CH}_2\text{CO}_2\text{H} > \text{CF}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{H} > \text{CF}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$



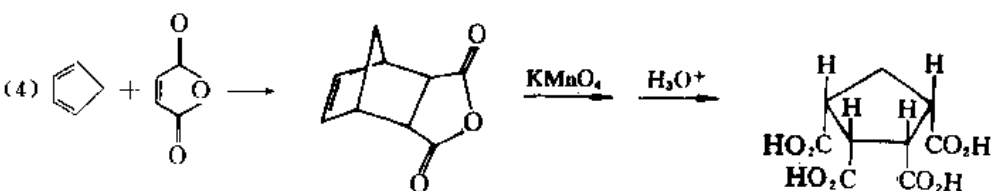
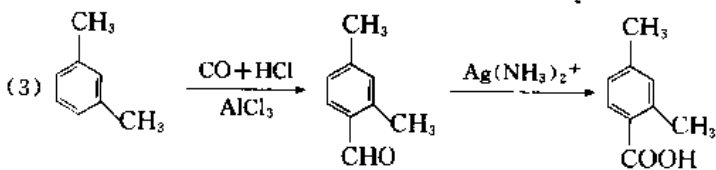
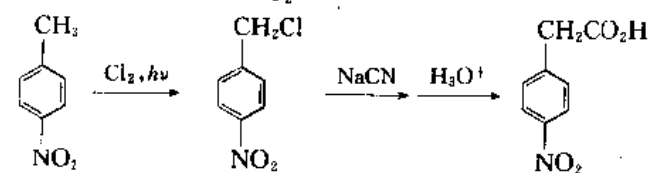
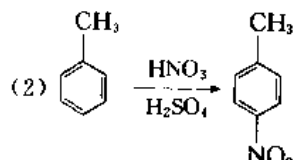
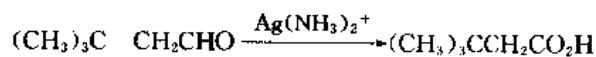
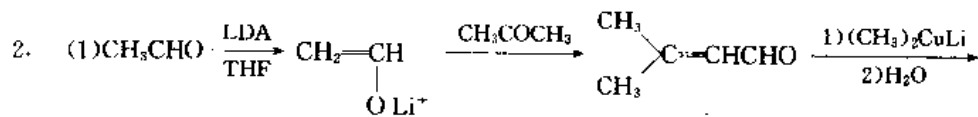
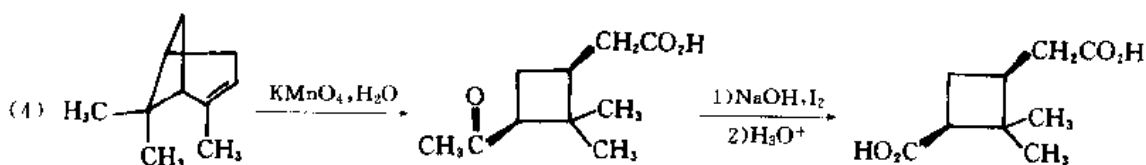
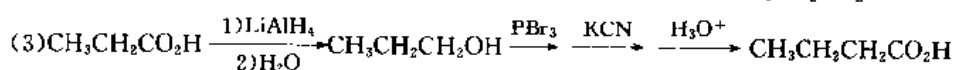
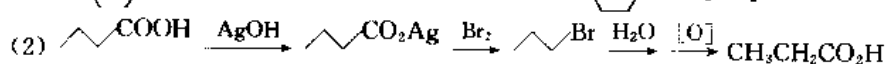
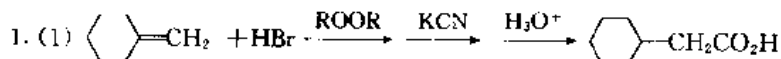


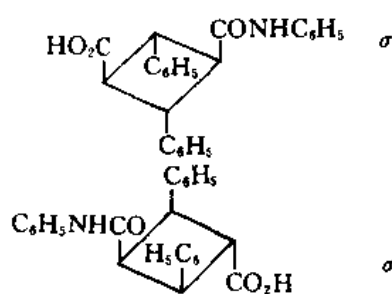
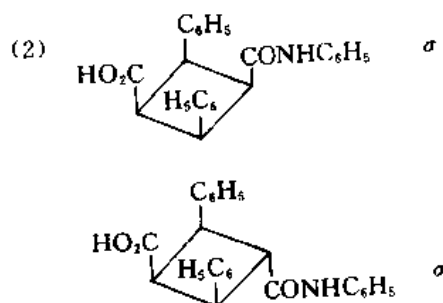
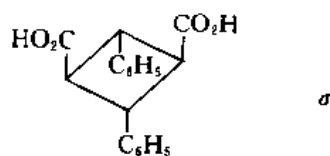
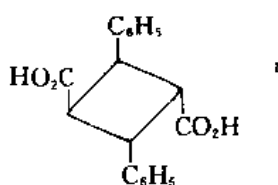
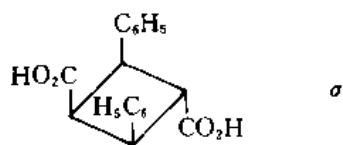
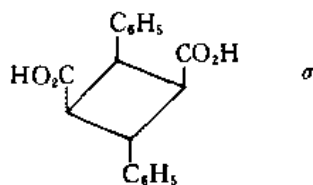
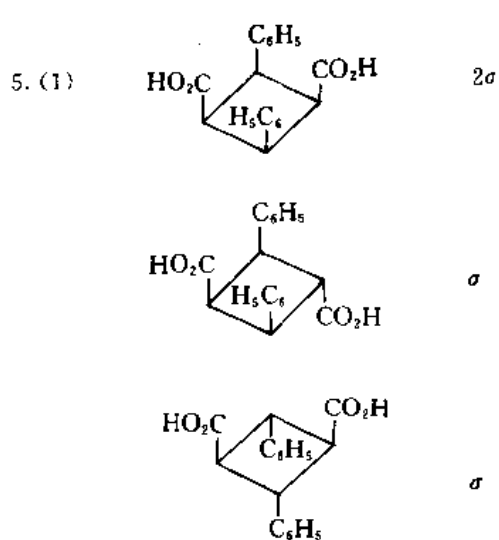
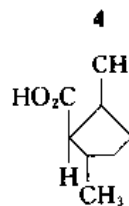
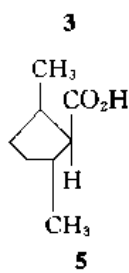
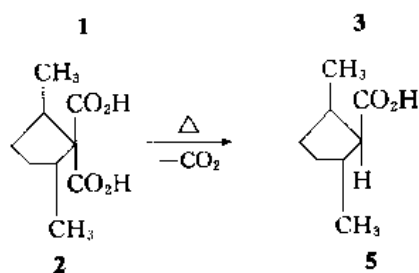
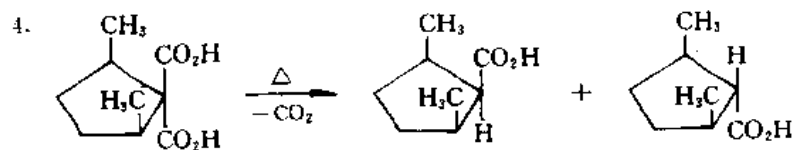
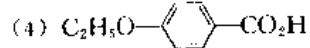
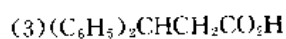
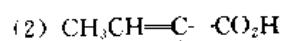
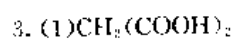
个羧基靠得近, 故反式比顺式的 K_{a1} 大。

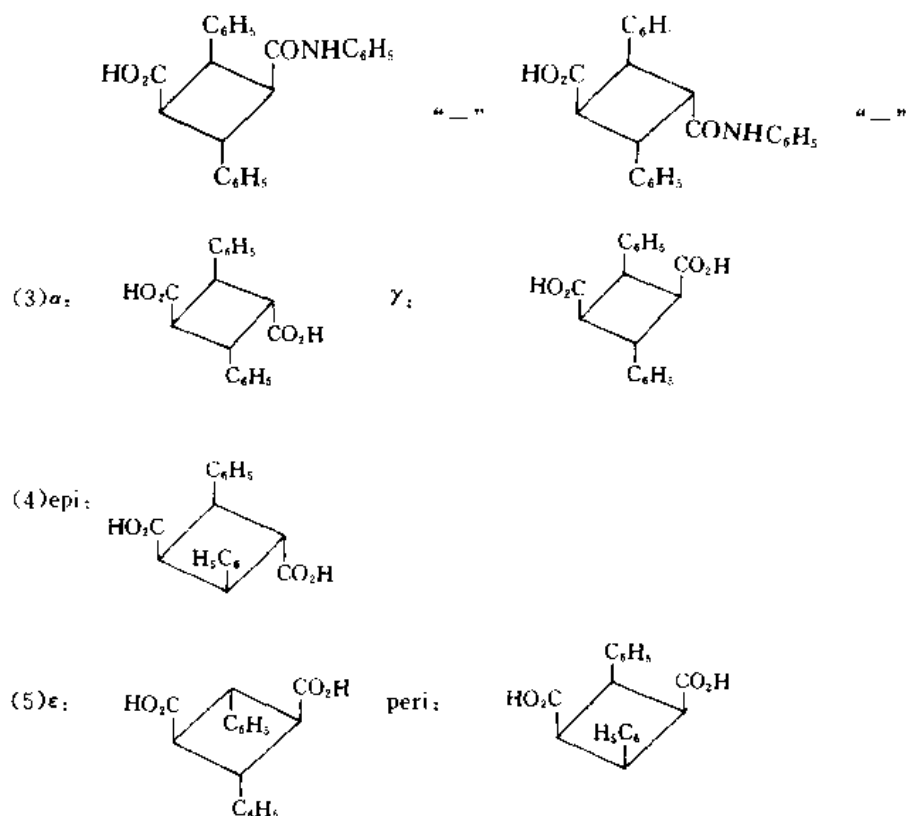
习题 14.9 (1) $(\text{CH}_3)_2\text{CHCO}_2\text{H}$



习题:





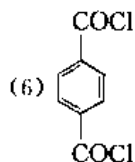


第十五章 羧酸衍生物

- 问题 15.1 (1) 环己基甲酸甲酯 (2) *N*-甲基丙酰胺 (3) 丁酸酐
 (4) 苯乙酰氯 (5) 苯丙腈 (6) 乙酸环己基酯

- 问题 15.2 (1) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CO}_2\text{CH}_2\text{CH}_2\text{CH}_3$ (2) $\text{C}_6\text{H}_5\text{CONHCH}_3$
 (3) $\text{CH}_3\text{CON}(\text{C}_2\text{H}_5)_2$ (4) $\text{CH}_3\text{CO}_2\text{C}_6\text{H}_5$

- (5) $\text{C}_6\text{H}_5\text{CO}_2\text{CH}_2\text{C}_6\text{H}_5$



问题 15.3 (略)

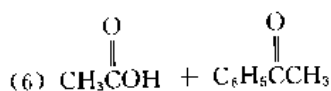
- 问题 15.4 (1) $\text{CH}_3\text{C}(=\text{O})\text{---}^{18}\text{OH} + \text{CH}_3\text{OH}$ $\text{A}_{\text{AC}2}$

- (2) $\text{CH}_3\text{C}(=\text{O})\text{OH} + (\text{CH}_3)_3\text{C---}^{18}\text{OH}$ $\text{A}_{\text{AC}1}$

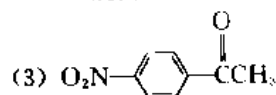
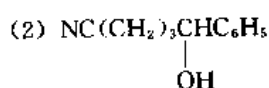
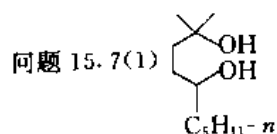
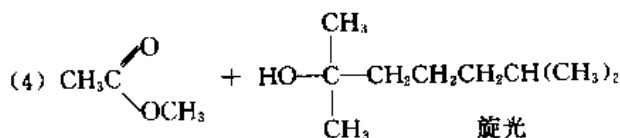
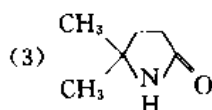
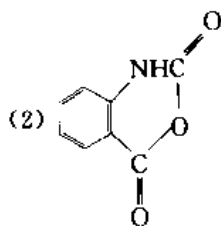
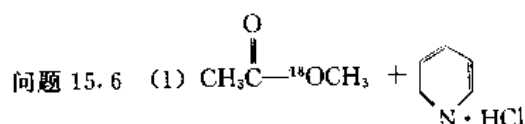
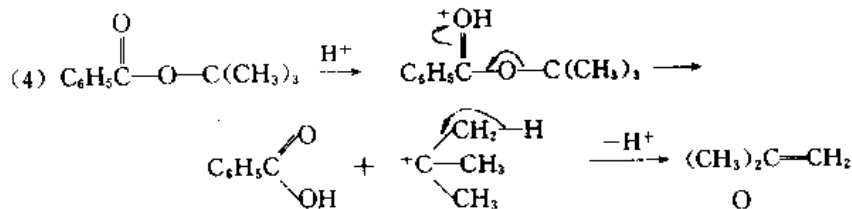
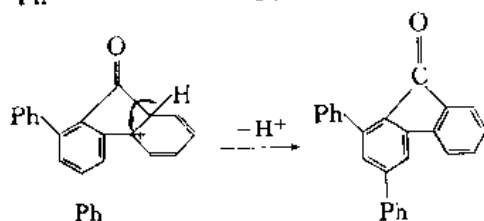
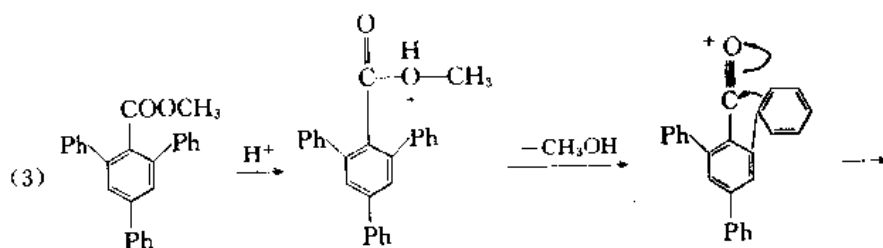
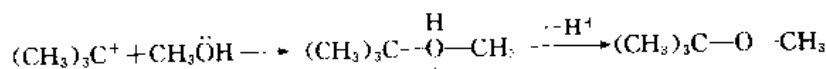
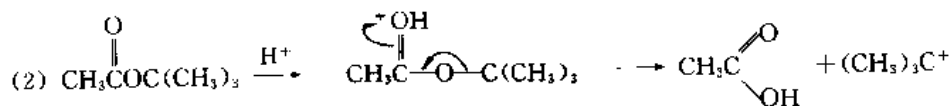
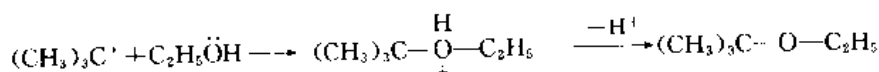
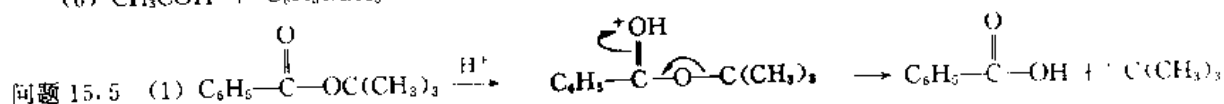
- (3) $\text{CH}_3\text{C}(=\text{O})\text{OH} + \text{HO---}\underset{\text{C}_2\text{H}_5}{\overset{\text{CH}_3}{\text{C}}}\text{---CH}_2\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)_2$ (旋光) $\text{A}_{\text{AC}1}$

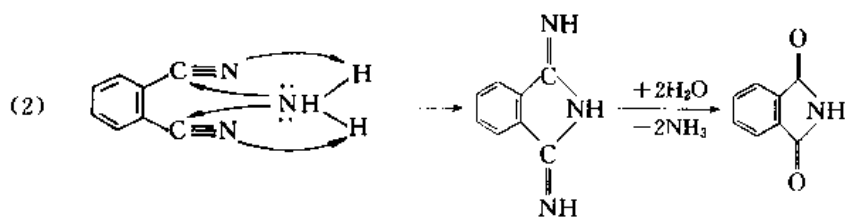
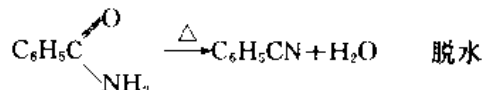
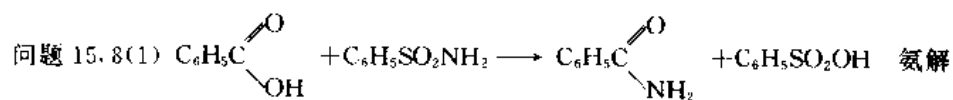
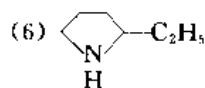
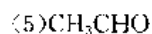
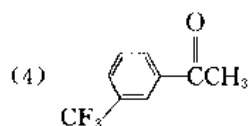
- (4) $\text{HOC---}\underset{\text{O}}{\overset{\text{O}}{\text{C}}}\text{---}\text{C}_6\text{H}_4\text{---COOC}(\text{CH}_3)_3 + \text{CH}_3\text{OH}$ $\text{B}_{\text{AC}2}$

- (5) $\text{CH}_3\text{OC---}\underset{\text{O}}{\overset{\text{O}}{\text{C}}}\text{---}\text{C}_6\text{H}_4\text{---CO}_2\text{H} + (\text{CH}_3)_3\text{COH}$ $\text{A}_{\text{AC}1}$

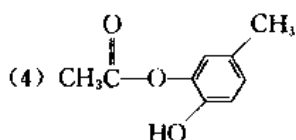
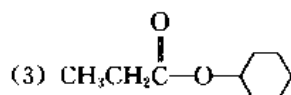
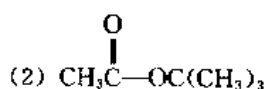
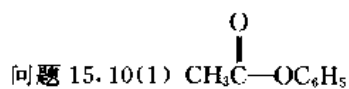
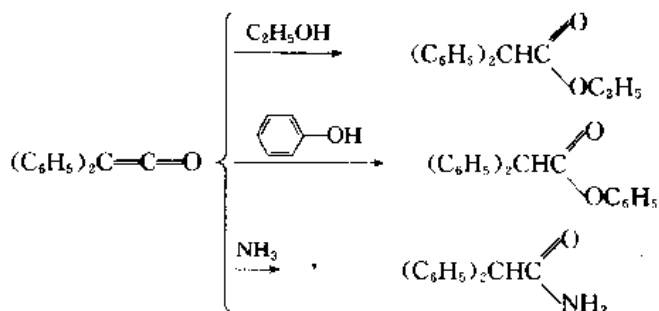


BAL 2

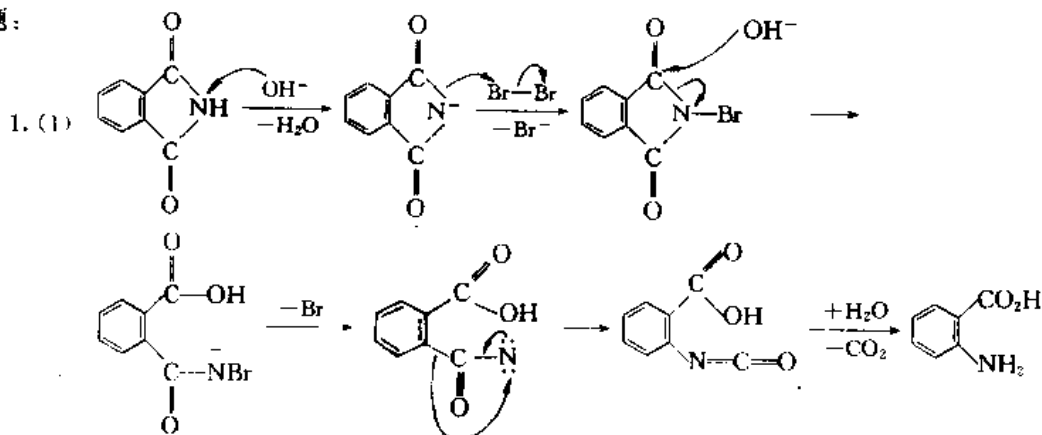


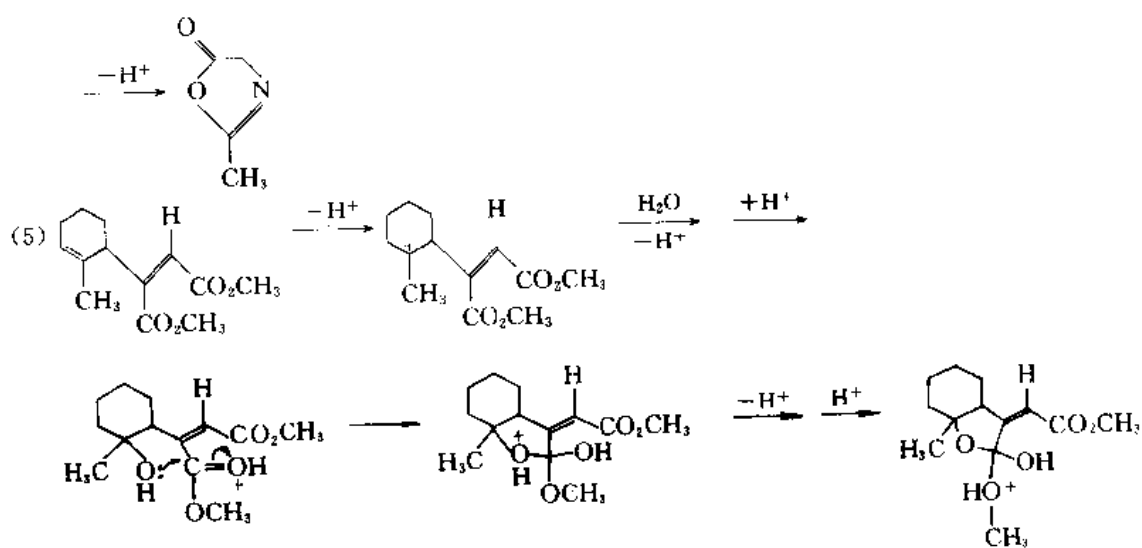
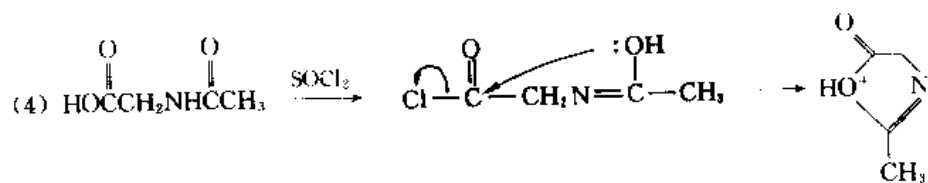
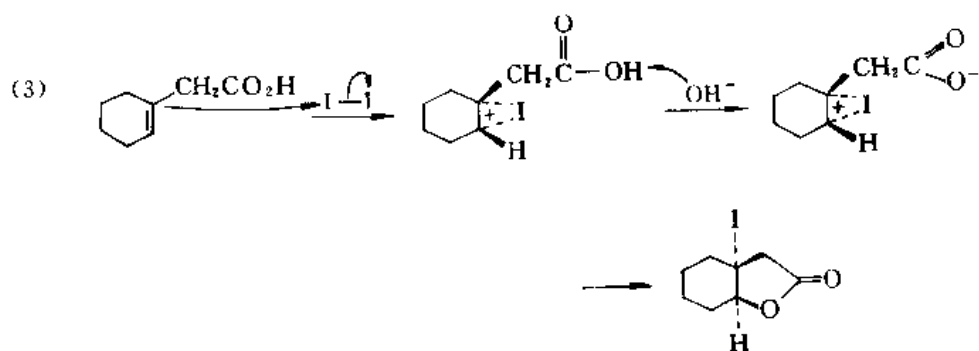
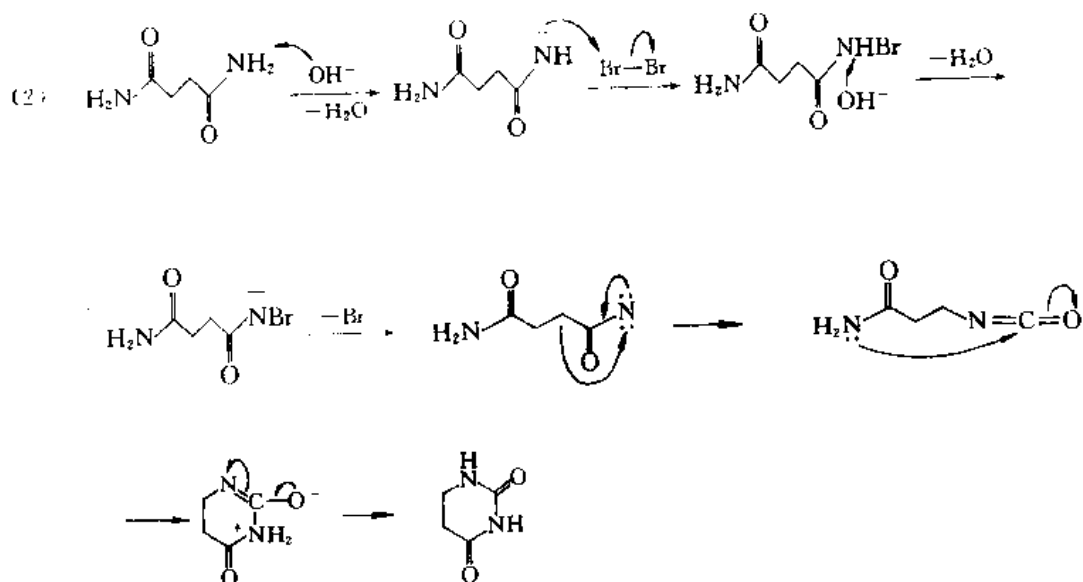


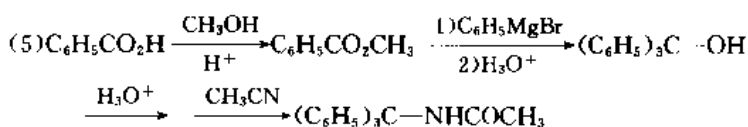
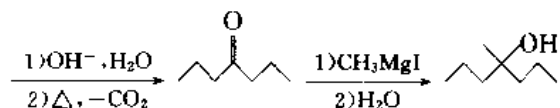
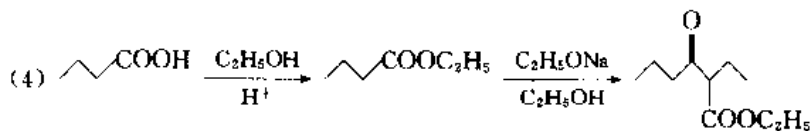
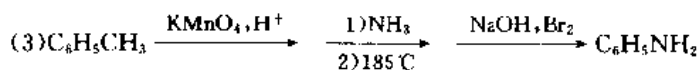
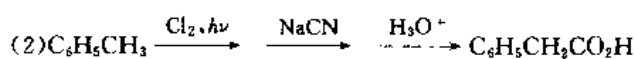
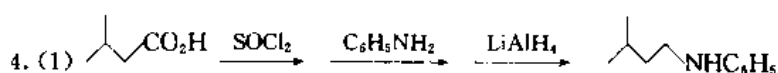
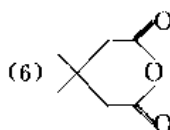
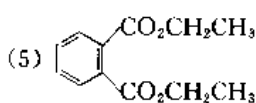
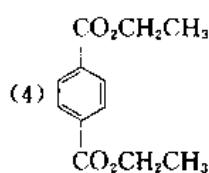
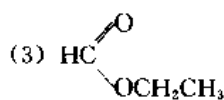
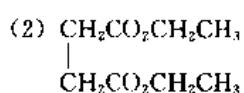
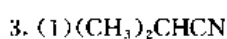
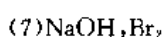
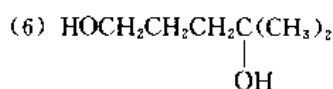
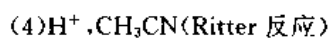
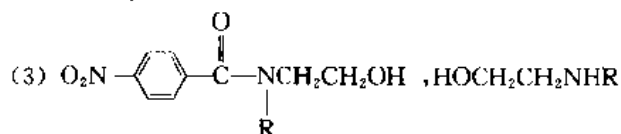
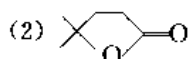
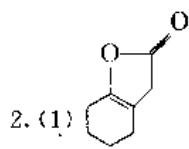
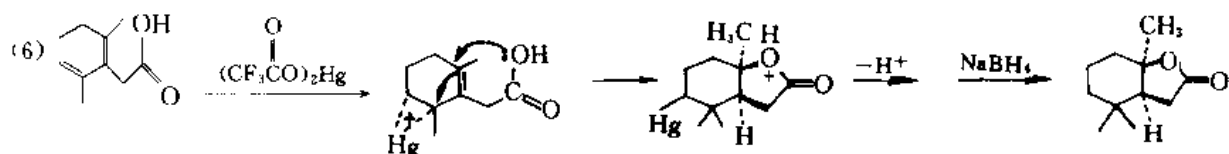
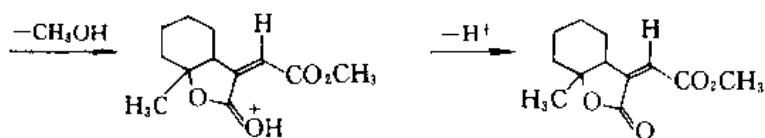
问题 15.9

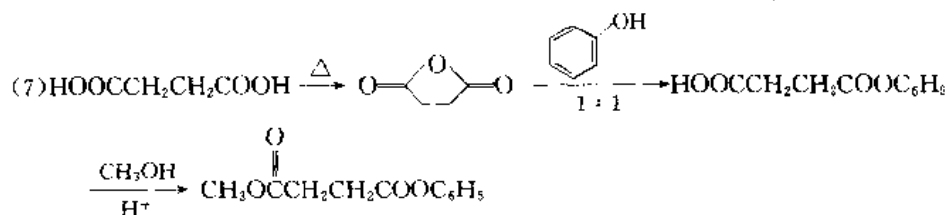
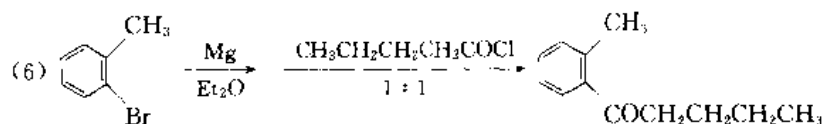


习题:







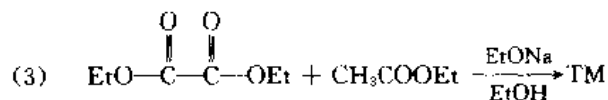
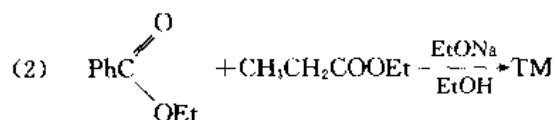
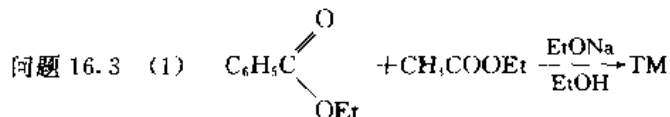
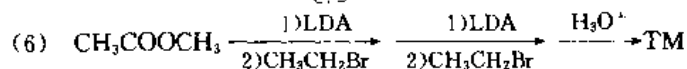
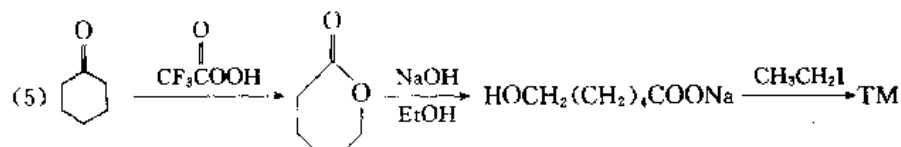
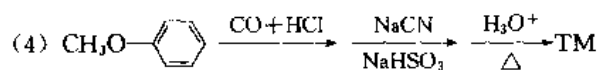
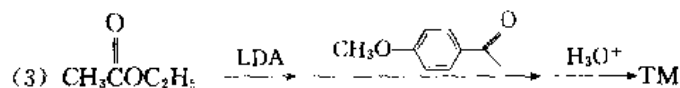
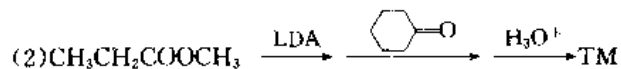
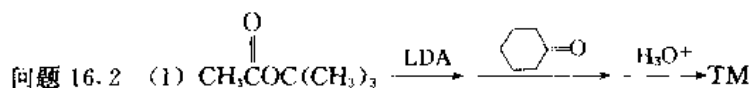
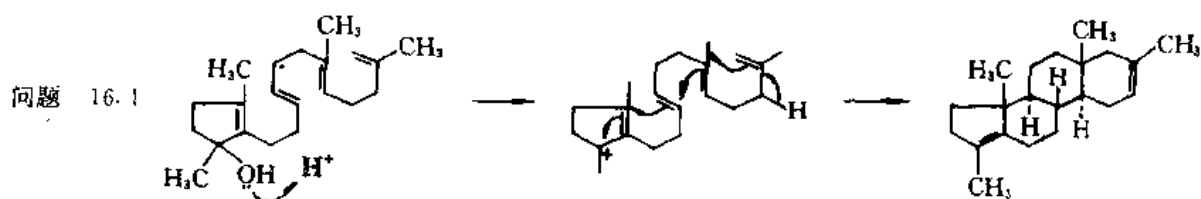


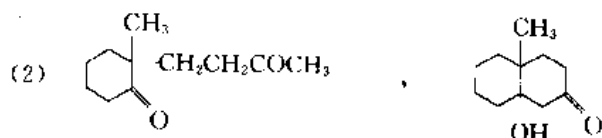
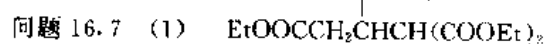
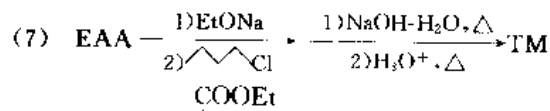
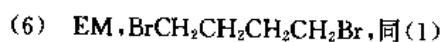
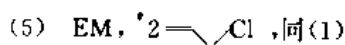
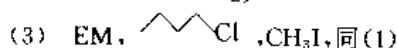
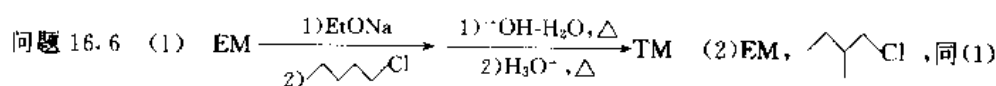
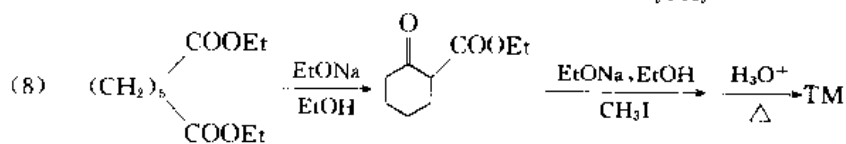
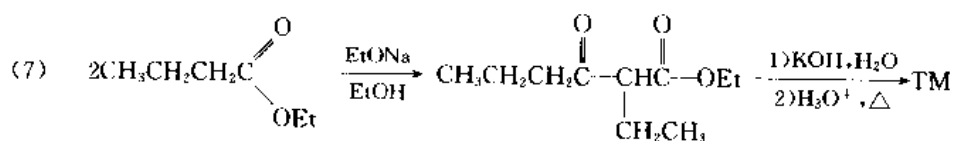
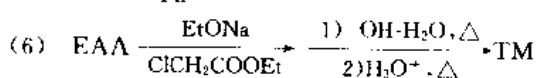
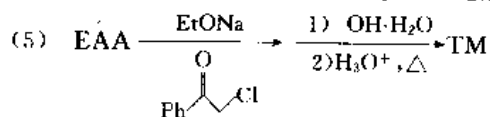
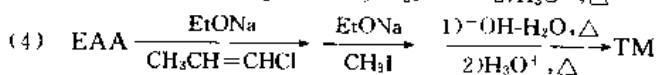
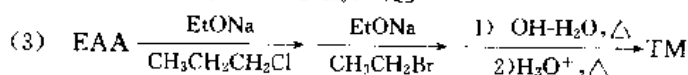
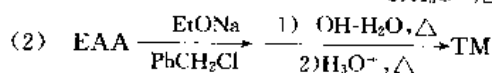
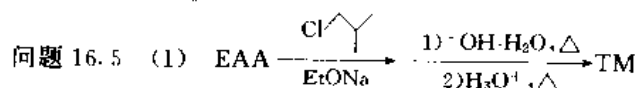
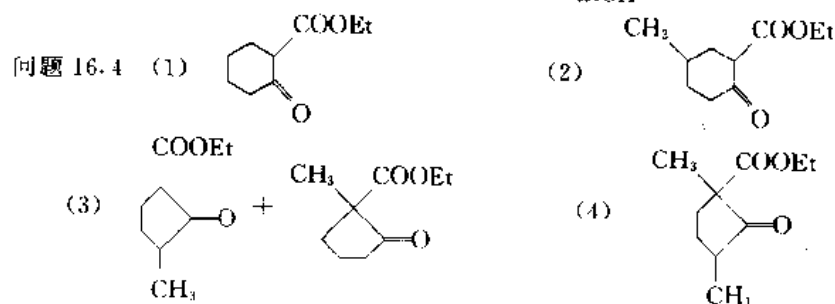
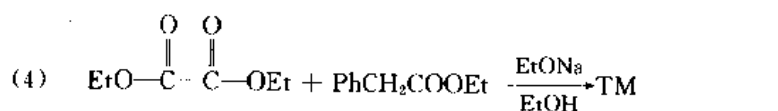
5. (2) 分别用 NaHCO_3 , NaOH 溶液使三者分开, 再各自提纯。

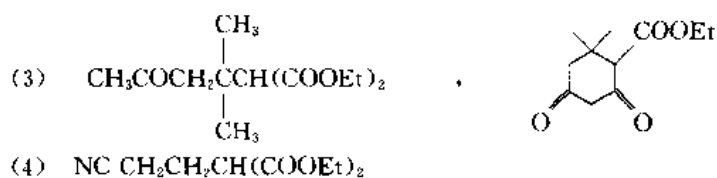
(3) 分别用 NaHCO_3 , NaOH 和饱和 NaHSO_3 溶液使四者分开, 再各自分解提纯。

(4) 分别用 NaHCO_3 , 饱和 NaHSO_3 溶液使三者分开, 再各自分解提纯。

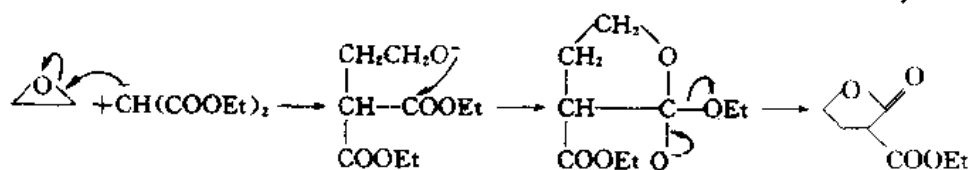
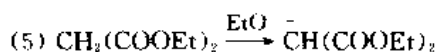
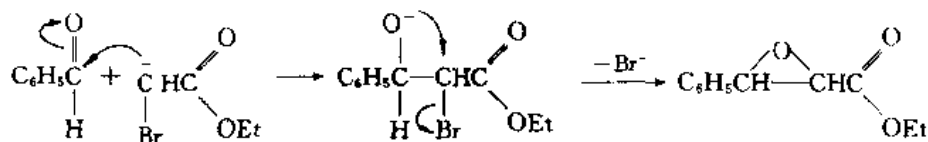
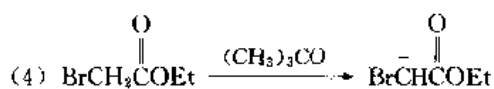
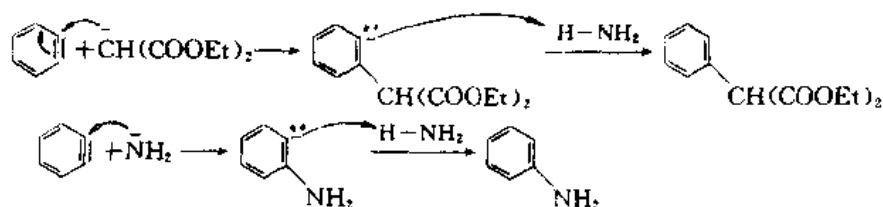
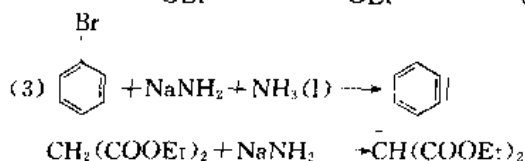
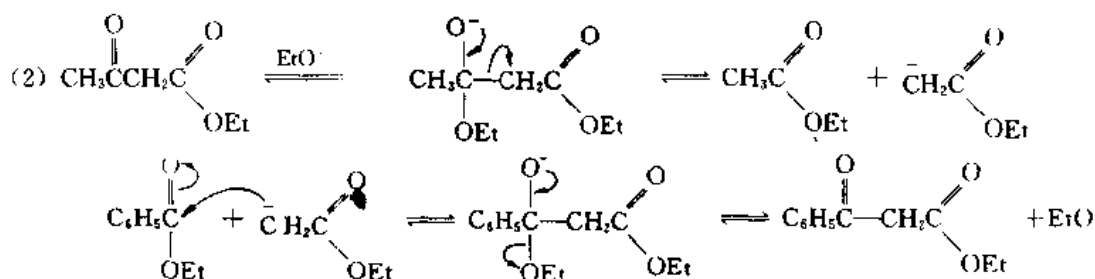
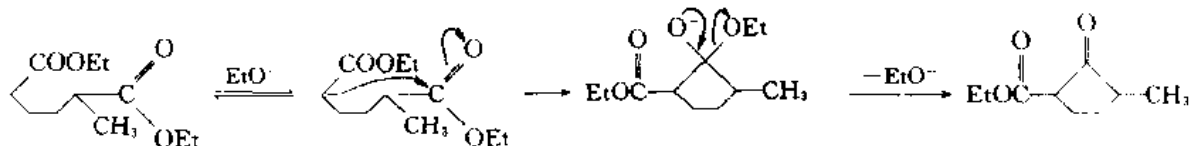
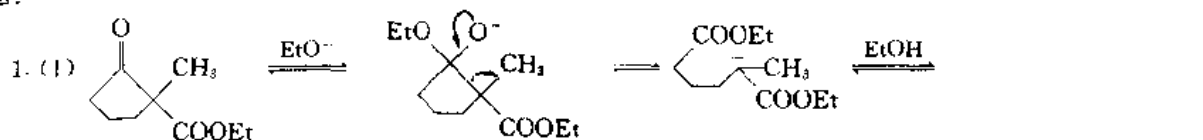
第十六章 不饱和羧酸和取代羧酸

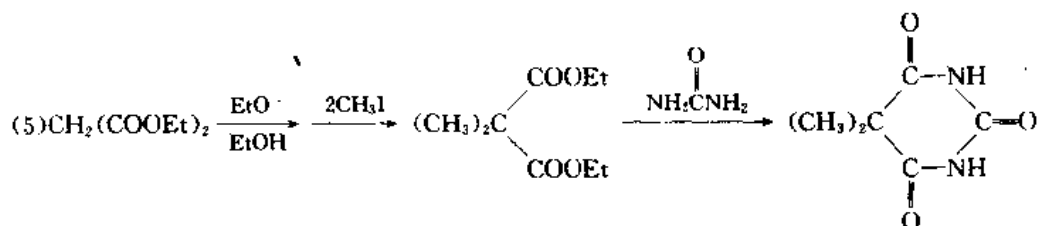
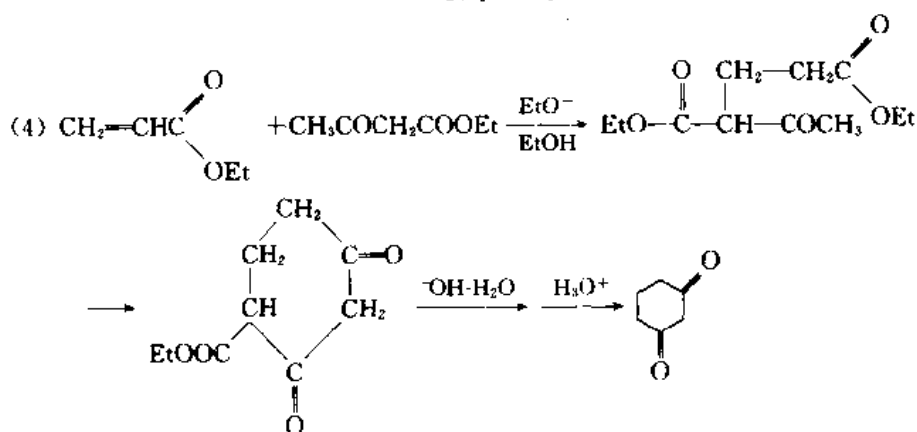
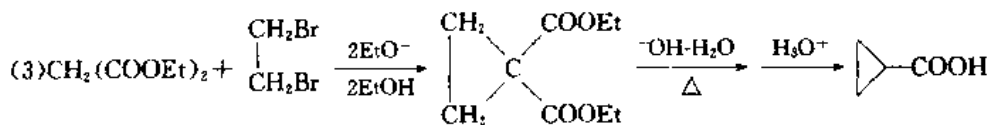
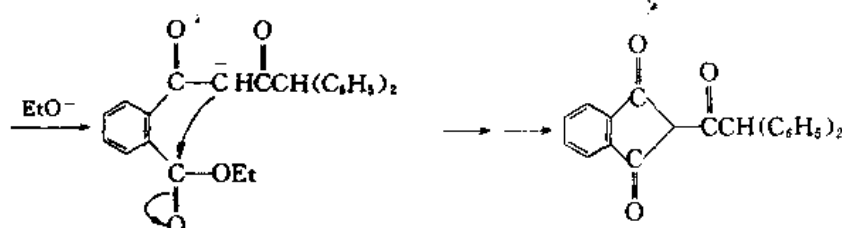
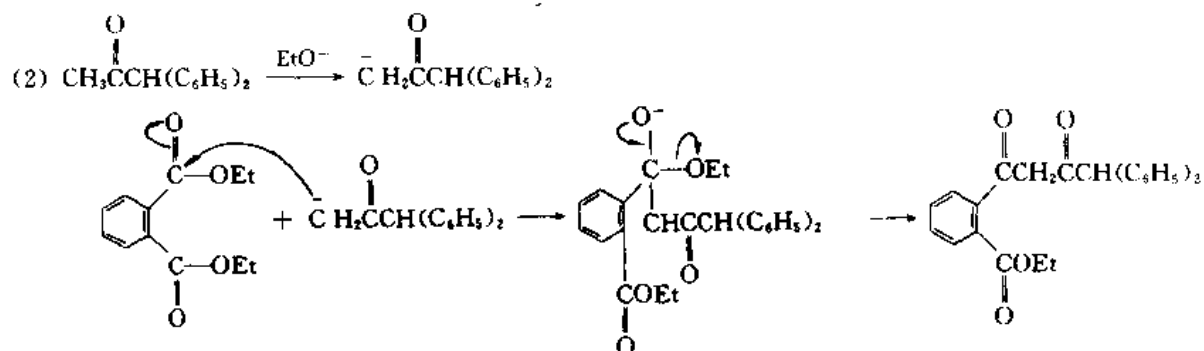
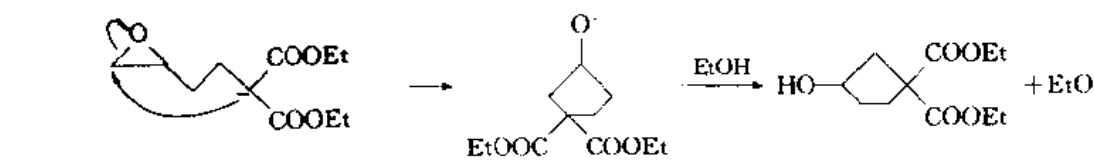
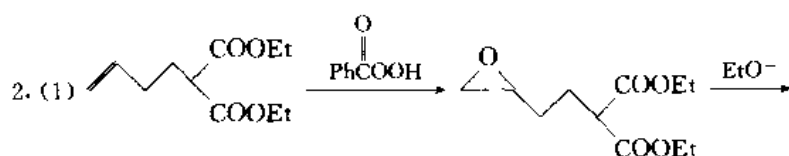


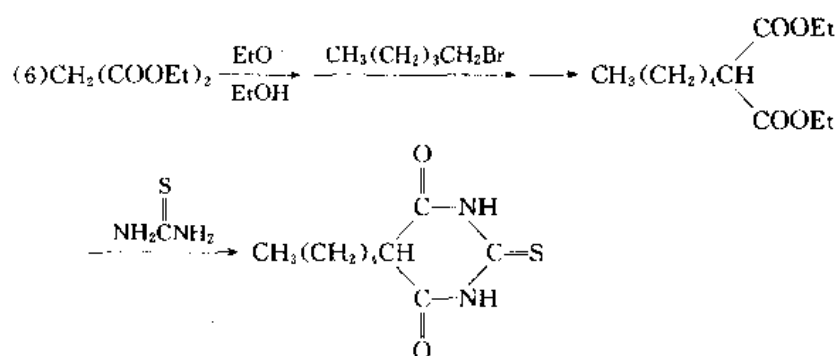




习题:



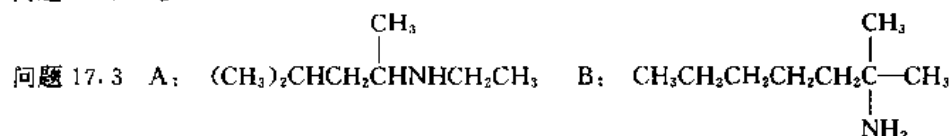




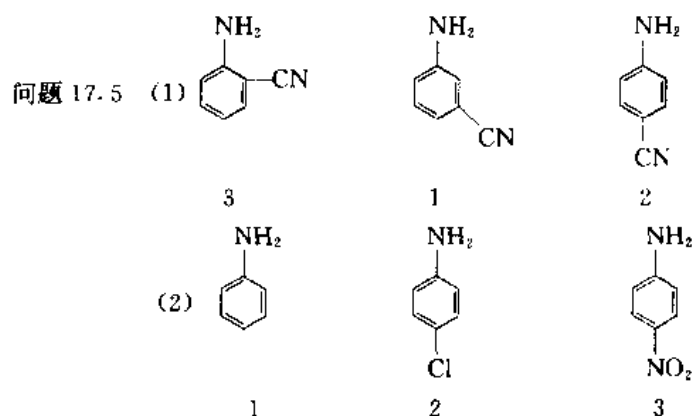
第十七章 胺

- 问题 17.1 (1) *N*-甲基环己胺 (2) *N,N*-二甲基-4-甲氧基苯胺
 (3) 反-2-甲基环丙胺 (4) 烯丙胺
 (5) *N,N*-二甲基-4-异丙基苯胺 (6) 氯化四苄基胺

问题 17.2 略

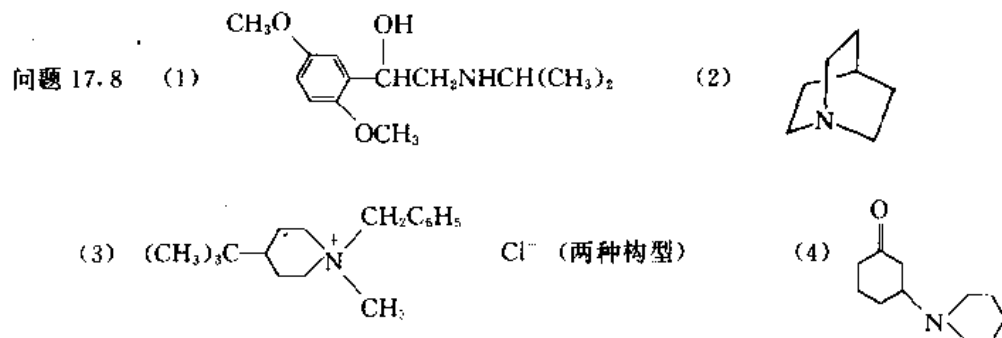


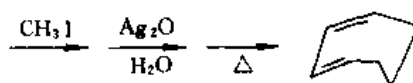
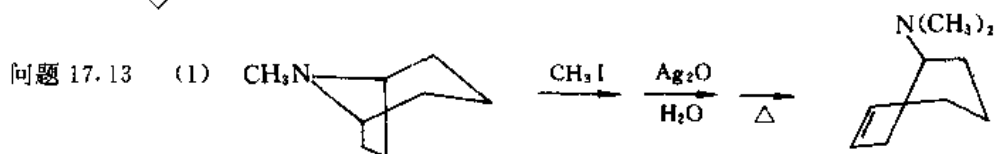
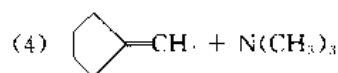
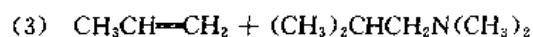
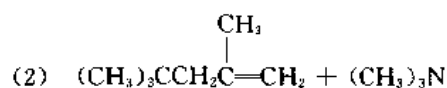
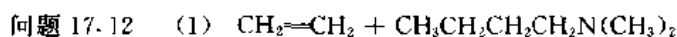
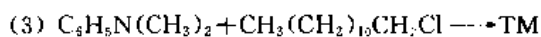
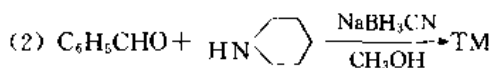
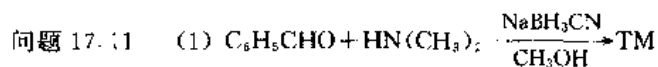
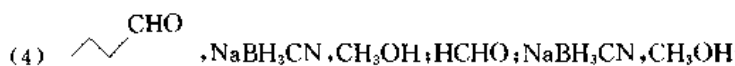
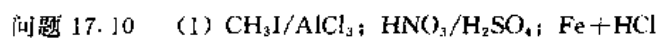
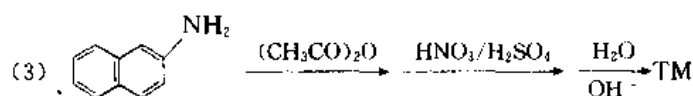
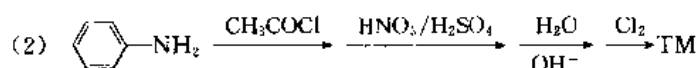
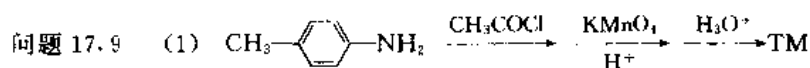
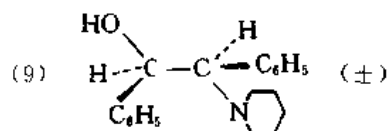
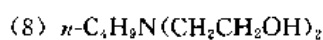
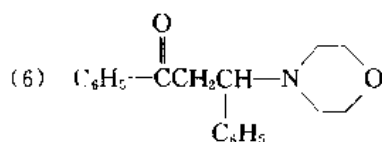
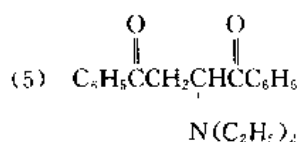
- 问题 17.4 (1) $\text{FCH}_2\text{CH}_2\text{NH}_2 < \text{CH}_3\text{CH}_2\text{NH}_2$ (2) $\text{FCH}_2\text{CH}_2\text{NH}_2 > \text{F}_3\text{CCH}_2\text{NH}_2$
 (3) $\text{CH}_3\text{OCH}_2\text{CH}_2\text{NH}_2 < \text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{NH}_2$ (4) $(\text{C}_6\text{H}_5)_2\text{NCH}_2\text{C}\equiv\text{N} < (\text{C}_2\text{H}_5)_3\text{N}$

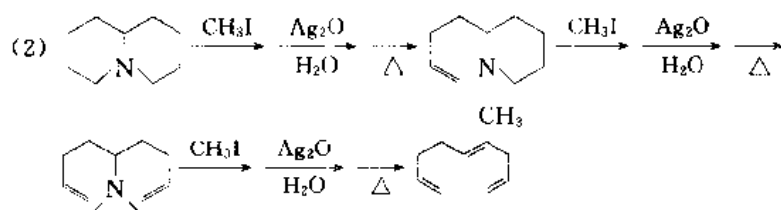


- 问题 17.6 (1) ①NaOH ②HCl (2) ①HCl ②NaHSO₃

问题 17.7 醇的外消旋体与邻苯二甲酐生成外消旋的邻苯二甲酸单酯。然后,再让外消旋的邻苯二甲酸单酯与另一个旋光的胺起反应成盐,盐为非对映体的混合物,可用重结晶方法分开。最后让分开的单酯水解,分别游离出旋光的醇。

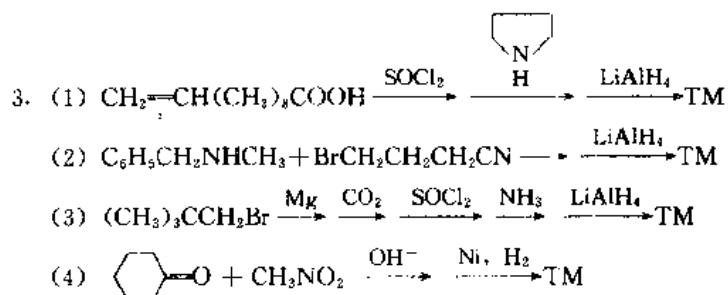
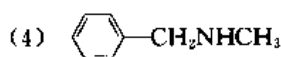
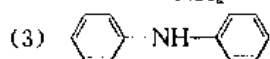
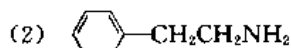
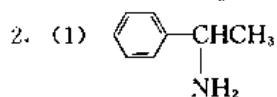
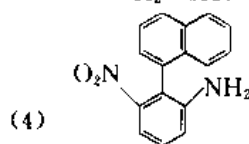
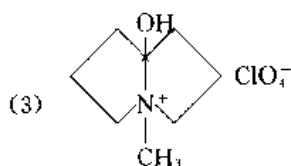
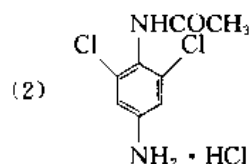




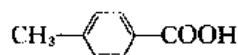
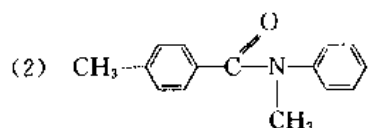
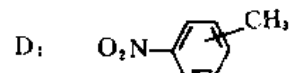
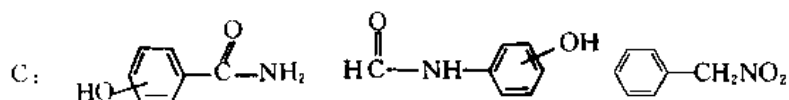
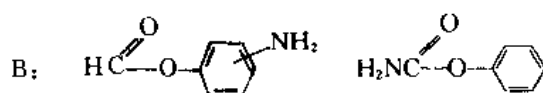
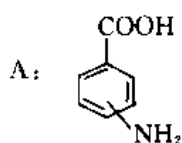


问题 17.14 略

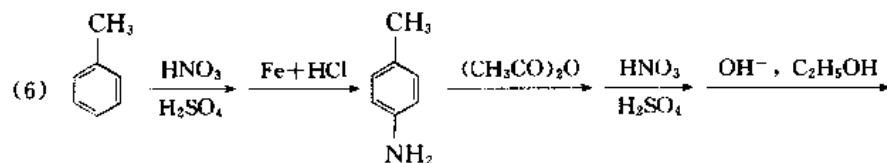
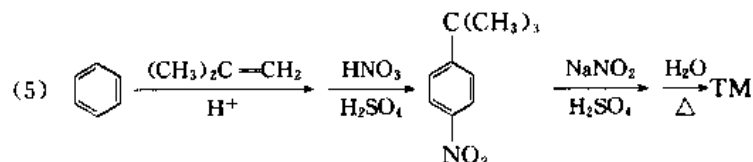
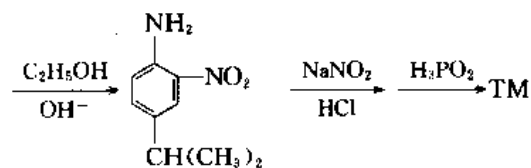
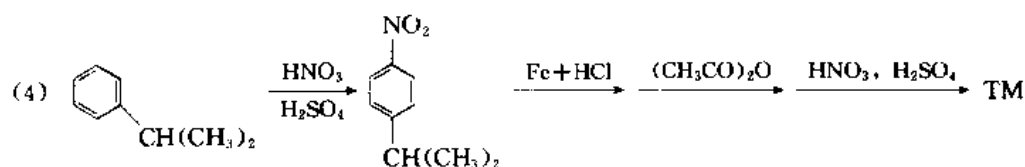
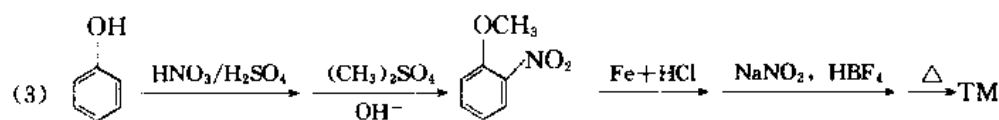
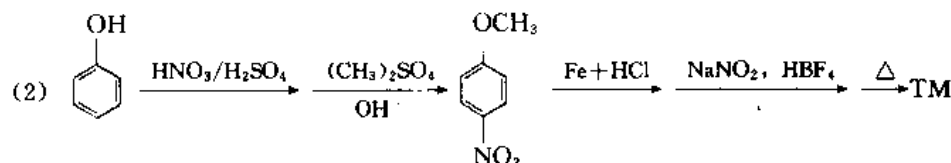
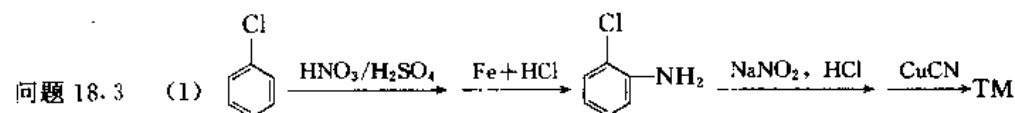
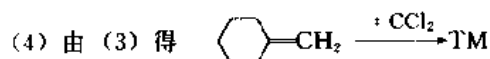
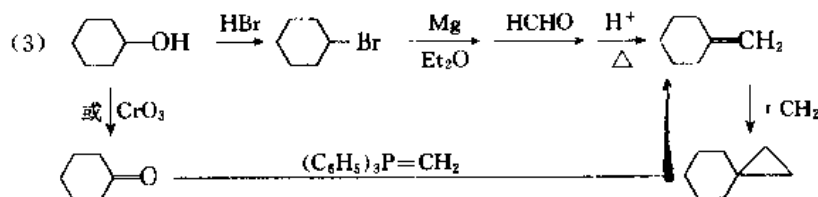
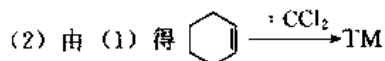
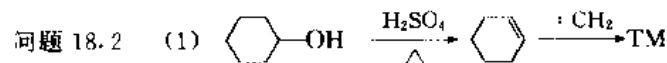
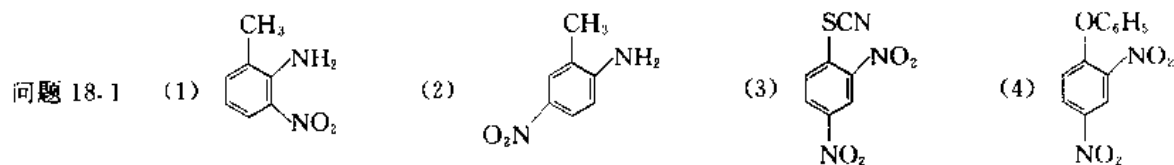
习题:

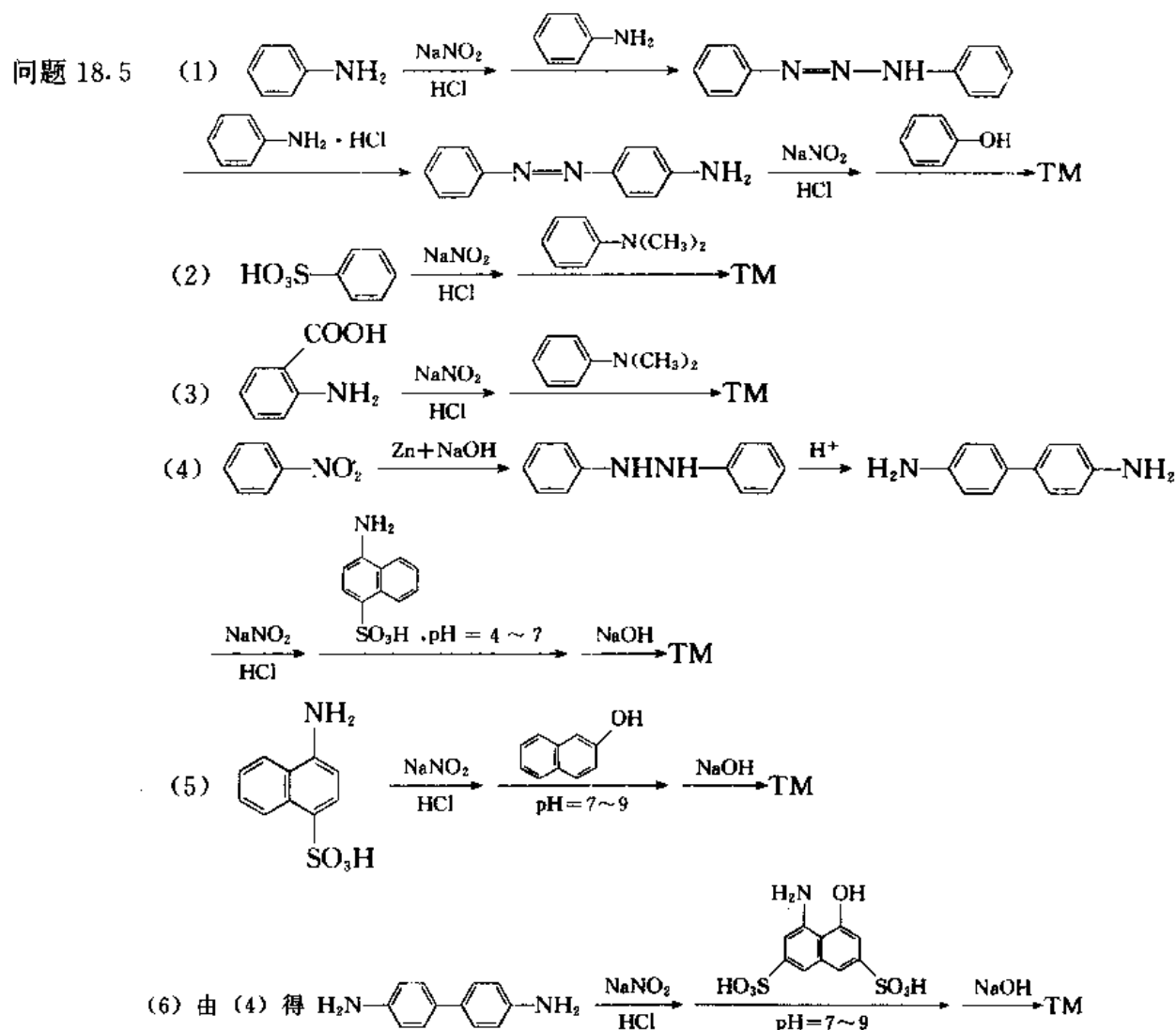
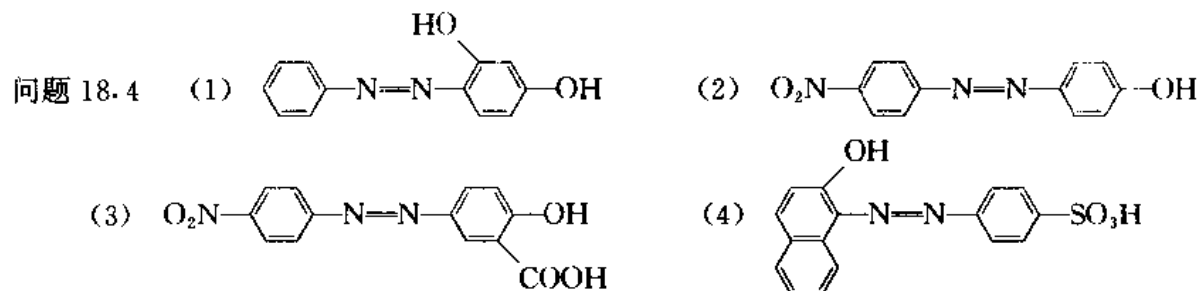
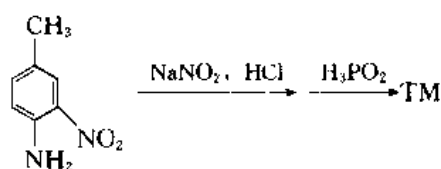


4. (1) 本题多解。

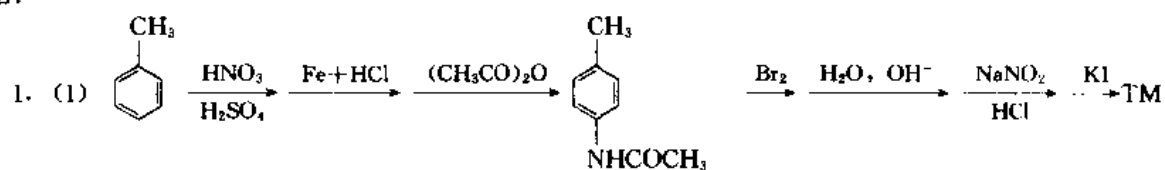


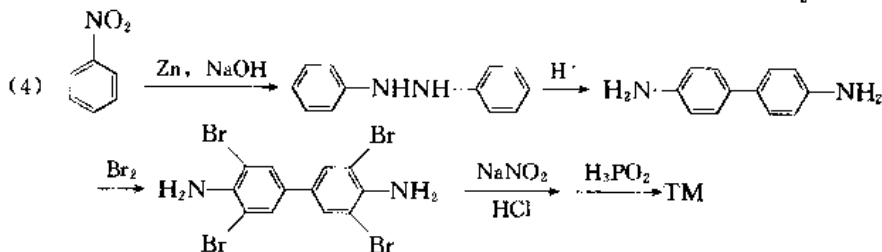
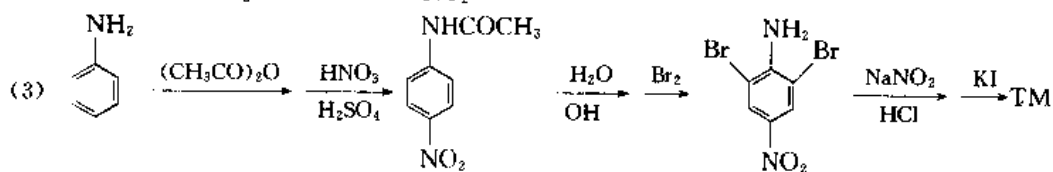
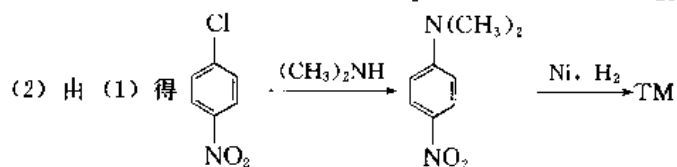
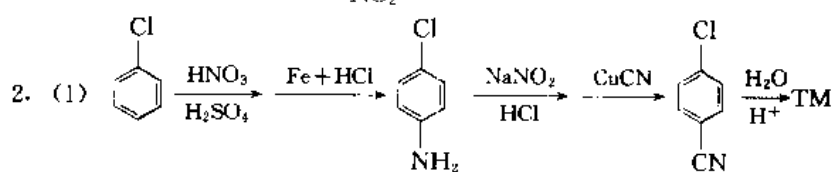
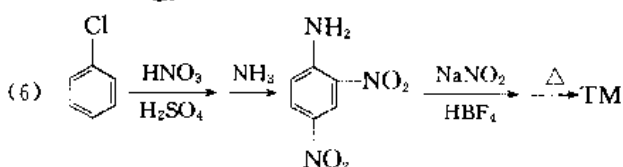
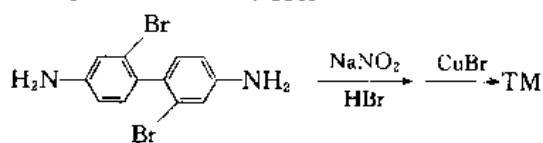
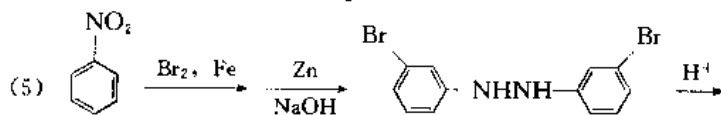
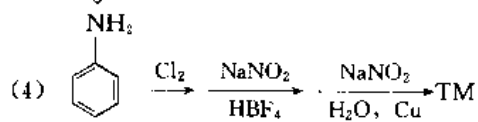
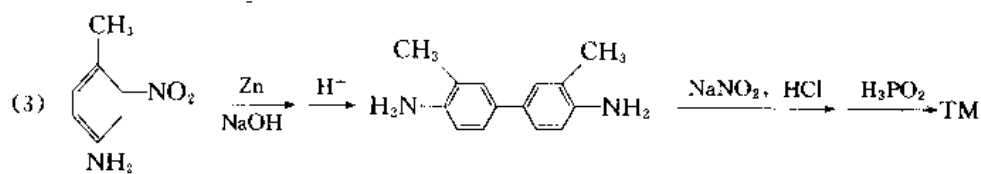
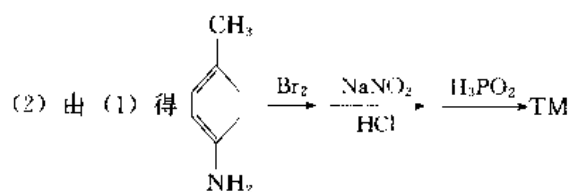
第十八章 其他含氮化合物





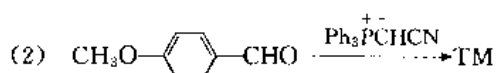
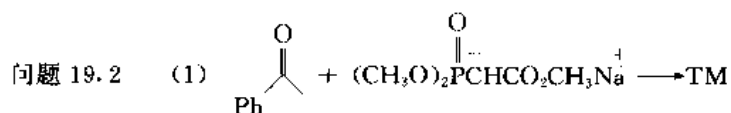
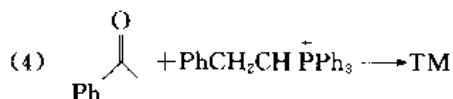
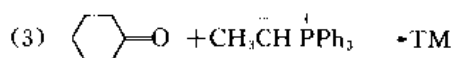
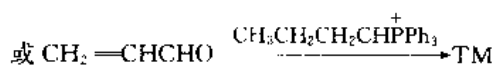
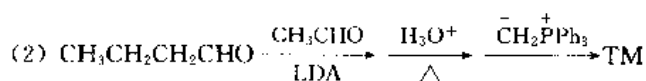
习题:





第十九章 含硫、磷和硅的化合物

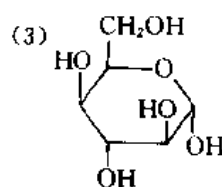
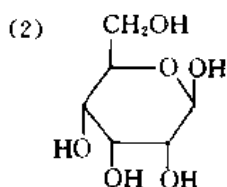
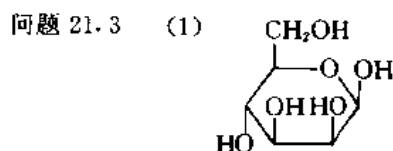
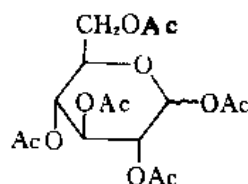
问题 19.1 (1) PhCHO + CH_3CH_2PPh_3 \longrightarrow TM



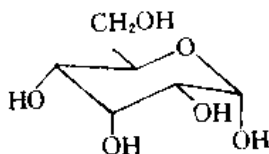
第二十一章 碳水化合物

问题 21.1 苷的部分水解。

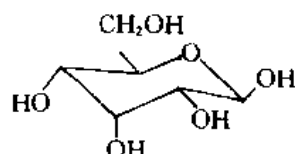
问题 21.2 D-葡萄糖以呋喃型存在，半缩醛上的羟基酯化后，当然没有了醛基的性质。



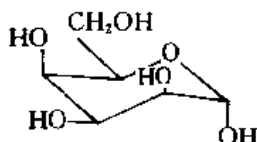
问题 21.4 α-D-阿洛糖



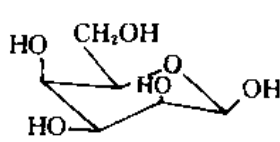
β-D-阿洛糖



α-D-塔罗糖

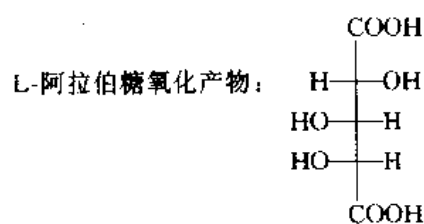


β-D-塔罗糖

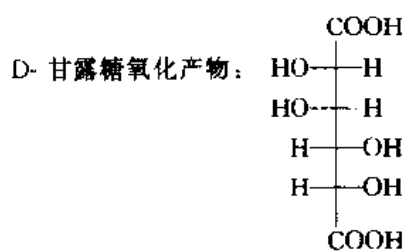


问题 21.5 甘露糖、阿洛糖、半乳糖和艾杜糖。

问题 21.6

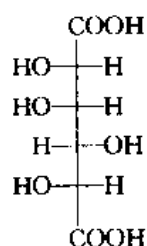


有旋光



有旋光

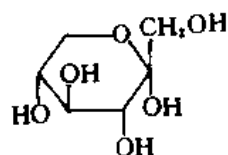
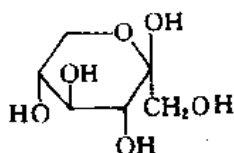
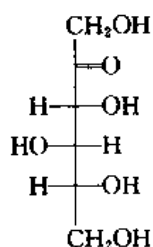
问题 21.7



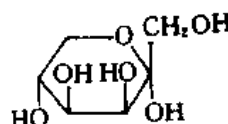
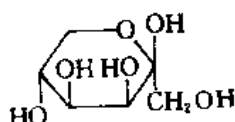
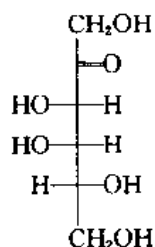
与 D-葡萄糖的氧化产物相同,有旋光。

问题 21.8

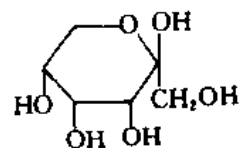
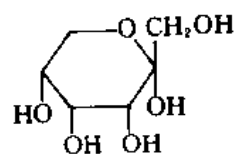
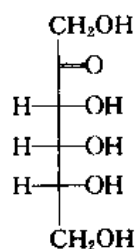
D-山梨糖



D-塔罗酮糖



D-阿洛酮糖



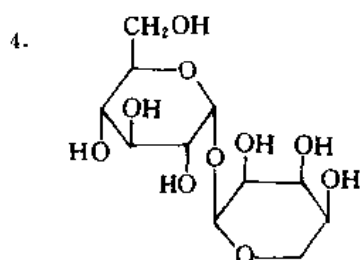
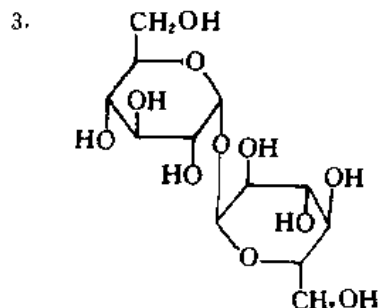
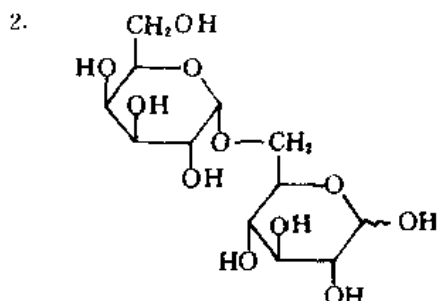
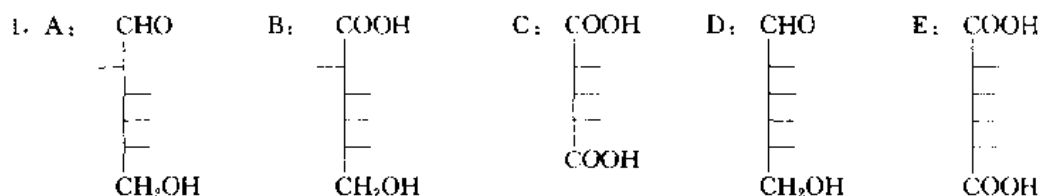
问题 21.9 i) HCN ii) Ba(OH)₂ iii) Na-Hg, H₂O

问题 21.10 见教材 634 页。

问题 21.11 见教材 634 页。

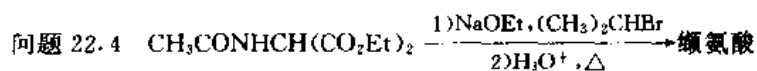
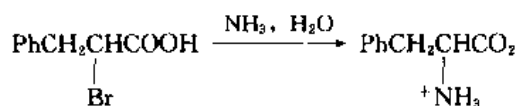
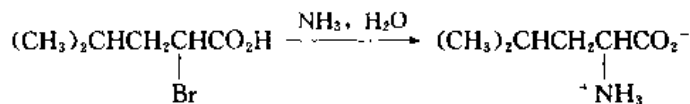
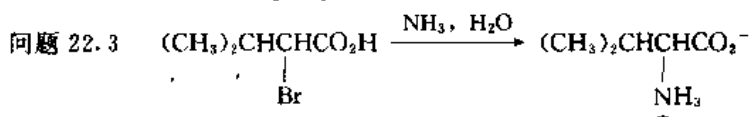
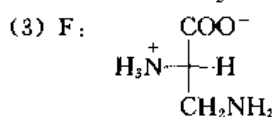
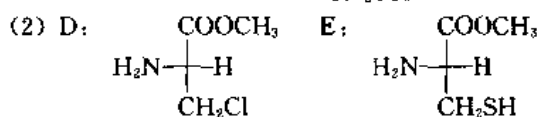
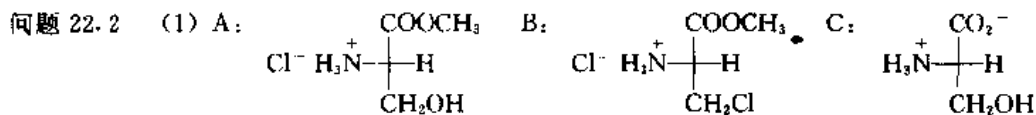
问题 21.12 见教材 634 页。

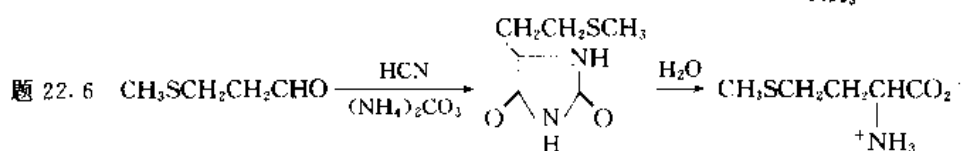
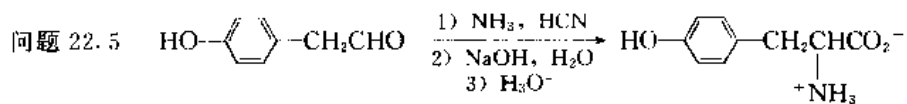
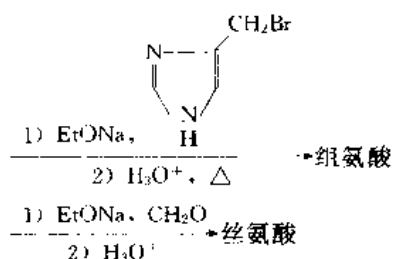
习题:



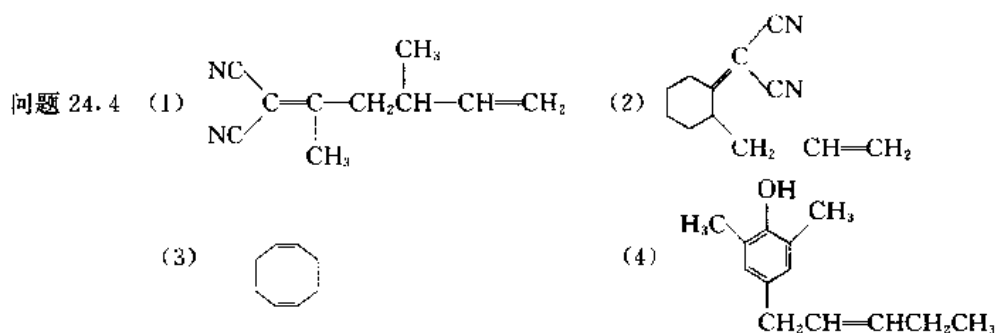
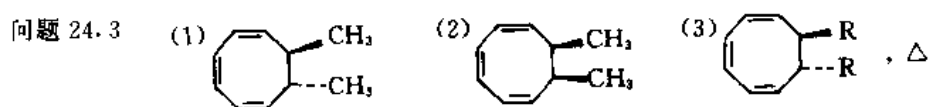
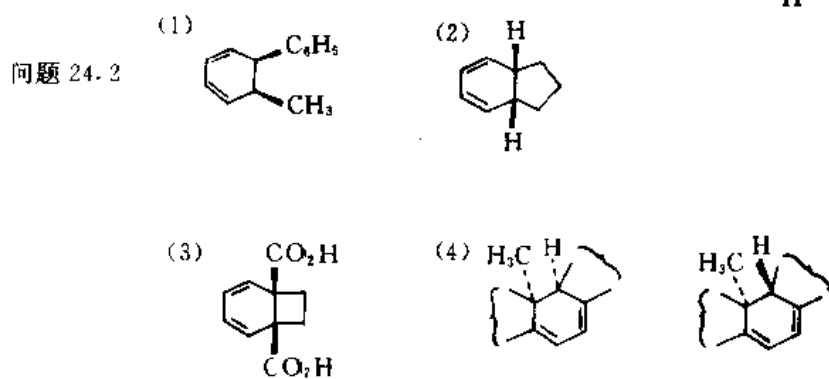
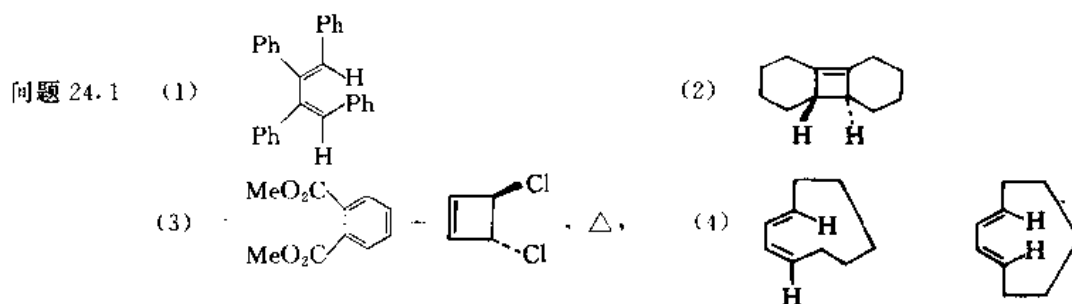
第二十二章 氨基酸、多肽、蛋白质和核酸

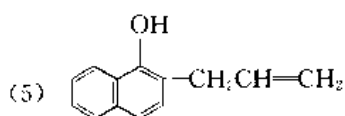
问题 22.1 L-丙氨酸: (S) - L-丝氨酸: (S) - L-半胱氨酸: (S) -





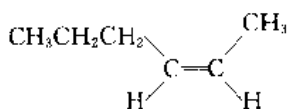
第二十四章 周环反应



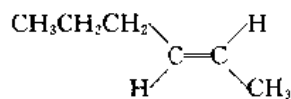


第二十五章 ^{13}C 核磁共振谱

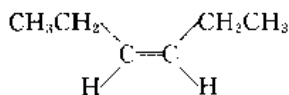
问题 25.1 1.



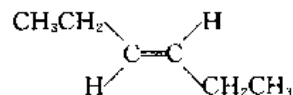
2.



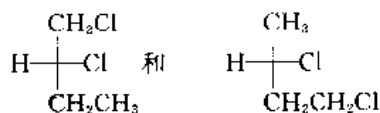
3.



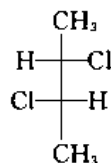
4.



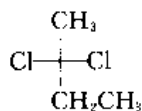
问题 25.2 1, 2



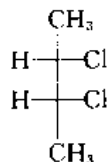
3.



4.

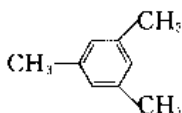


5.

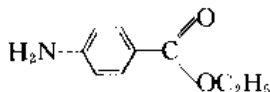


问题 25.3 $\text{CH}_3\text{CH}_2\text{COCH}_3$

问题 25.4



问题 25.5



第二十六章 有机合成

习题:

