第二部分　有 机 化 学

一、系 统 命 名

1．用系统命名法命名下列烷烃

(1) $(CH_3)_3CCH_2C(CH_3)_3$

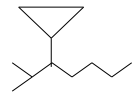
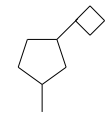
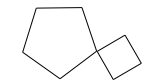
(2) $(CH_3)_2CH—CH_2CH_2—CH(CH_3)—CH(CH_3)—CH_2CH_3$

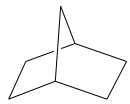
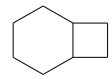
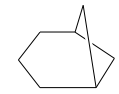
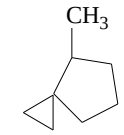
(3) $CH_3—CH(CH_2CH(CH_3)_2)—CH_2—C(CH_2)(CH_3)—CH_2CH_3$

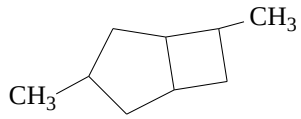
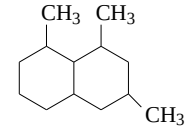
(4) $(CH_3CH_2)_2CH—CH(CH_3)—CH_2CH_3$

(5) $CH_3CH_2CH(CH_3)—CH_2—CH(CH_3)—CH(CH_2CH(CH_3)_2)—CH_2CH_2CH(CH_3)_2$

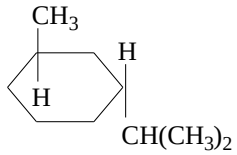
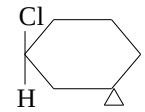
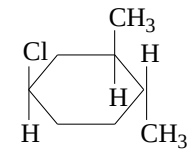
2．用系统命名法命名下列环烷烃

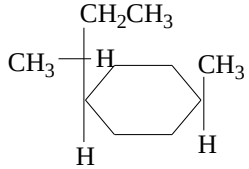
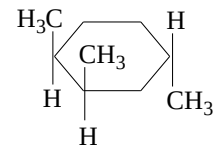
(1)  　(2)  　(3)  　(4) 

(5)  　(6)  　(7)  　(8) 

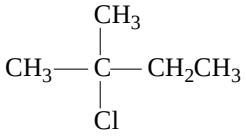
(9)  　(10) 

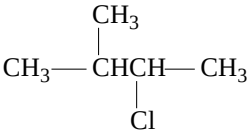
3．用系统命名法将下列取代环烷烃命名

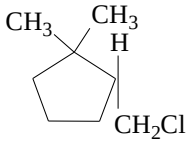
(1)  　(2)  　(3) 

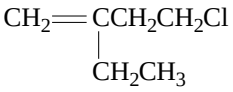
(4)  　(5) 

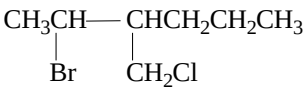
4．用系统命名法命名下列卤代烃

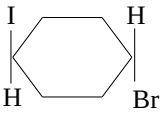
(1) 

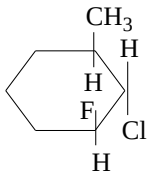
(2) 

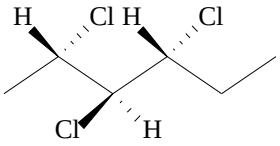
(3) 

(4) 

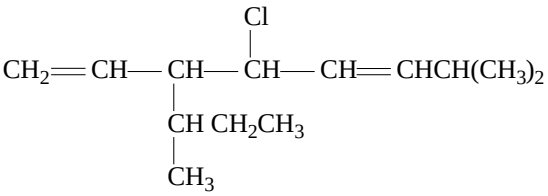
(5) 

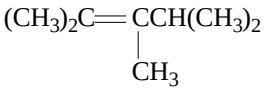
(6) 

(7) 

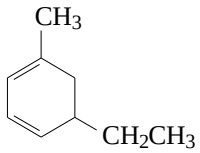
(8) 

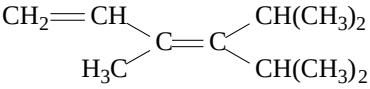
5．将下列烯烃用系统命名法命名

(1) 

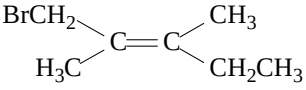
(2) 

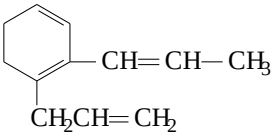
(3) 

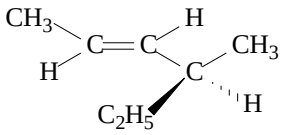
(4) 

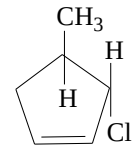
(5) 

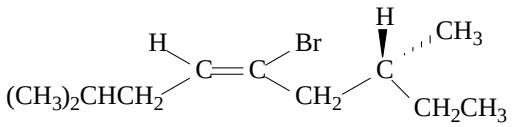
(6) 

(7) 

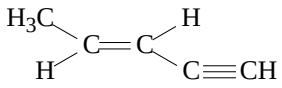
(8) 

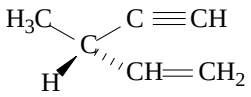
(9) 

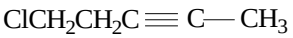
(10) 

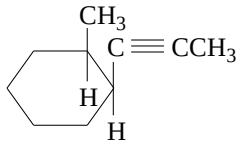
(11) 

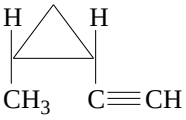
6．用系统命名法命名下列不饱和烃

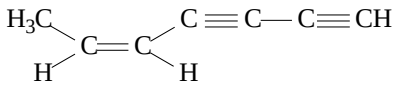
(1) 

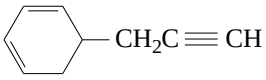
(2) 

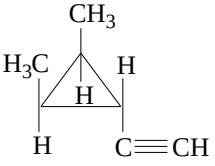
(3) 

(4) 

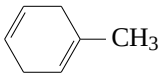
(5) 

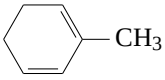
(6) 

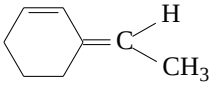
(7) 

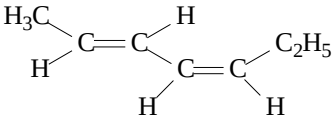
(8) 

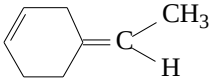
7．将下列双烯烃化合物用系统法命名

(1) 

(2) 

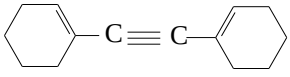
(3) 

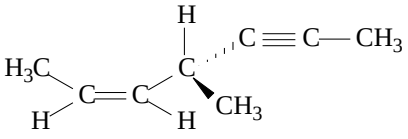
(4) 

(5) 

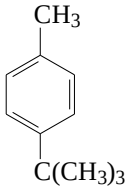
(6) $CH_2{=}CHC{\equiv}CCH{=}CH_2$

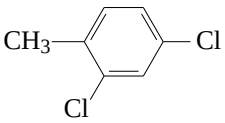
(7) $CH_2{=}CH{-}CH{=}CH{-}CH_2C{\equiv}CH$

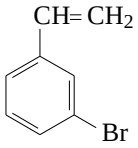
(8) 

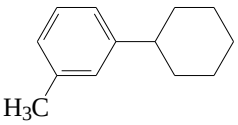
(9) 

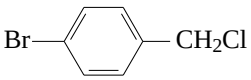
8．写出下列芳香族化合物的名称

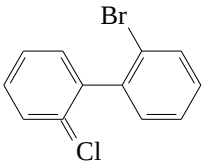
(1) 

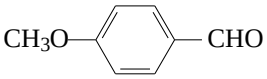
(2) 

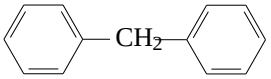
(3) 

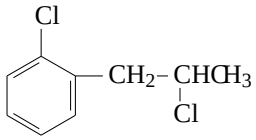
(4) 

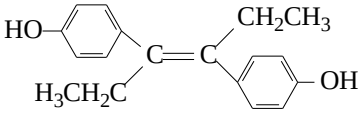
(5) 

(6) 

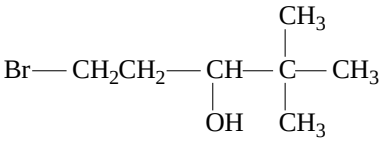
(7) 

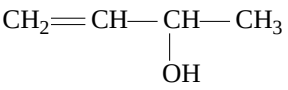
(8) 

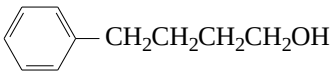
(9) 

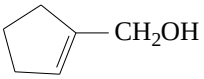
(10) 

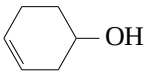
9．将下列醇用系统命名法命名

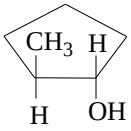
(1) 

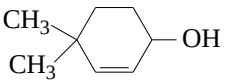
(2) 

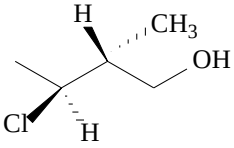
(3) 

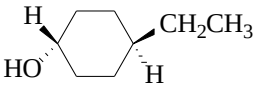
(4) 

(5) 

(6) 

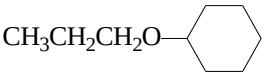
(7) 

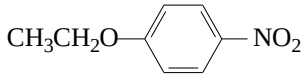
(8) 

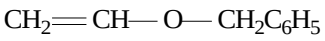
(9) 

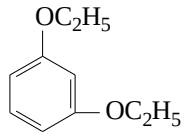
10．将下列醚类化合物命名

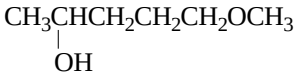
(1) $CH_3OCH_2CH_2Cl$

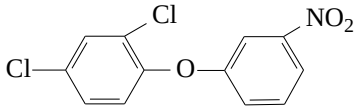
(2) 

(3) 

(4) 

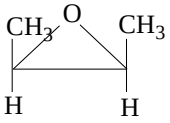
(5) 

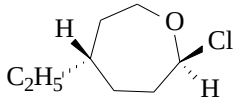
(6) 

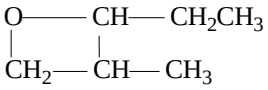
(7) 

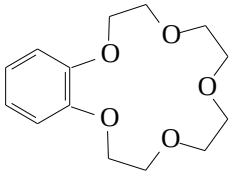
(8) 

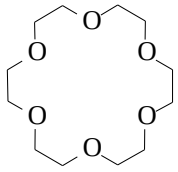
(9) 

(10) 

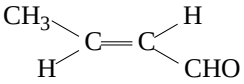
(11) 

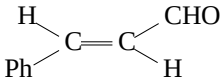
(12) 

(13) 

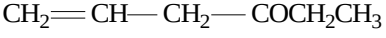
(14) 

11．将下列醛酮分别用普通命名法和系统命名法命名

(1) 

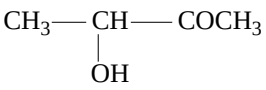
(2)  （Ph—苯基）

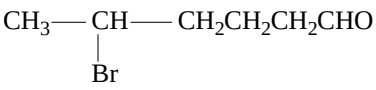
(3) 

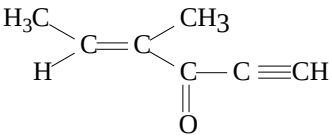
(4) 

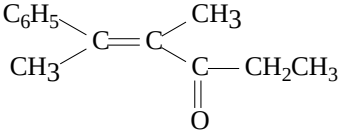
(5) $CH_3COCH(CH_3)_2$ (6) $Cl_2CHCOCH_3$ (7) $PhCH_2COCH_2Ph$

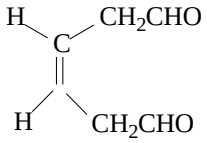
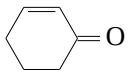
12．将下列醛酮用系统命名法命名

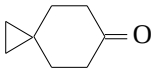
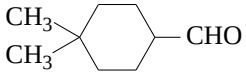
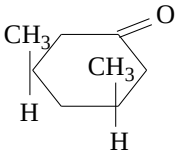
(1) 

(2) 

(3) 

(4) 

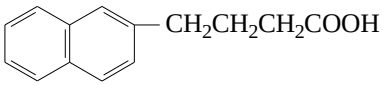
(5) $(CH_3)_2CH—CH_2COCH_2CH_2OH$ (6)  (7) 

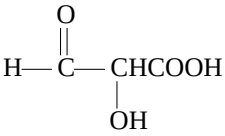
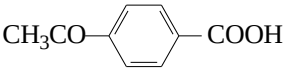
(8)  (9)  (10) 

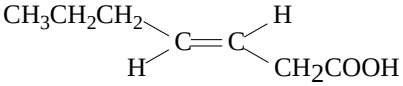
13．将下列羧酸用系统命名法命名

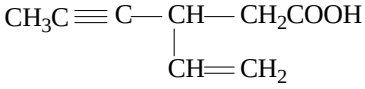
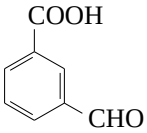
(1) $CH_3CH{=}CHCOOH$ (2) $CH_3C(CH_3)_2COOH$

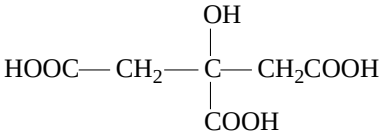
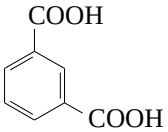
(3) $BrCH_2CH_2CH_2COOH$ (4) $CH_3CH_2COCH_2COOH$

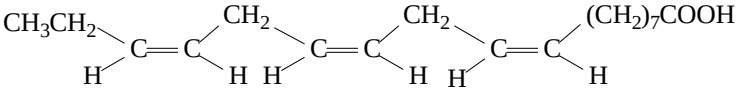
(5) $HO—CH_2CH_2CHCOOH$ (6) 

(7)  (8) 

(9)  (10) 

(11)  (12) 

(13)  (14) 

(15) 

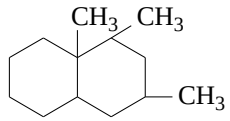
二、烷、烯、炔

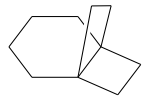
1．如果烷烃中 1°氢、2°氢和 3°氢被氯化时的活性比是 1∶3.8∶5，计算 2-甲基丁烷被氯化时产物的相对比及各产物的百分比。

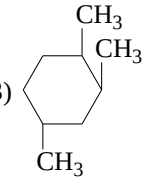
2．烷烃中 1°氢∶2°氢∶3°氢被溴化时相对活性比是 1∶82∶1600，计算丙烷被一溴化时，各一溴产物的相比对及各产物的百分比。

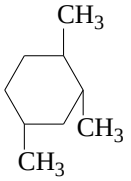
3．某烷烃 A 分子式为 C_6H_{14}，氯化时可以得到两种一氯产物。试推出烷烃 A 的结构。

4．命名下列各化合物

(1) 

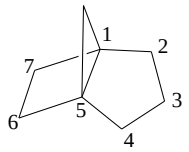
(2) 

(3) 

(4) 

5．写出甲基环己烷发生自由基溴化反应时得到一溴化产物，并命名和预计主要一溴化产物。

6．写出在–60℃时，Br_2 与三环[3.2, 1, $0^{1.5}$]辛烷反应的产物



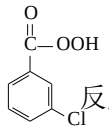
+ Br_2 ⟶

7．完成下列反应式

(1) $CF_3CH = CH_2 + HBr$ ⟶

(2) $BrCH = CH_2 + HBr$ ⟶

(3) $CH_3OCH = CH-CH_3 + HBr$ ⟶

8. 写出顺–2–丁烯和反–2–丁烯与间氯过氧苯甲酸  反应，然后再水解的反应产物。

9．写出顺、反–2 丁烯与碱性稀冷高锰酸钾水溶液反应产物。

10．(E)–5–庚烯–1–醇与 HCl 反应生成产物（A），分子式为 $C_7H_{14}O$，而与 Br_2 反应生成产物（B），分子式为 $C_7H_{13}OBr$。试推测（A）、（B）的结构，并用反应式表示其形成过程。

11．3, 3–二甲基–1–丁烯与 HI 起亲电加成反应，生成分子式为 $C_6H_{13}I$ 的两异构体（A）和（B），（A）经醇–氢氧化钾处理得到原料，3, 3–二甲基–1–丁烯。（B）经同样条件处理后，再经 $O_3/Zn/H_2O$ 处理得到丙酮（$CH_3\overset{\overset{O}{\|}}{C}-CH_3$），试推测（A）和（B）的结构，并用反应式表示各步反应过程。

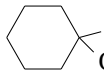
12．化合物（A）分子式为 $C_{10}H_{14}$，在 Pd 催化下加氢，可以吸收 3mol H_2，得到 1–甲基–4–异丙基环己烷。（A）经臭氧化（O_3/H_2O+Zn），还原性水解得到等物质量的化合物 HCHO，$CH_3-\overset{\overset{O}{\|}}{C}-CH_2CHO$，$CH_3-\overset{\overset{O}{\|}}{C}-\overset{\overset{O}{\|}}{C}-CH_2CHO$，试推测化合（A）

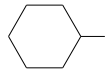
的结构。

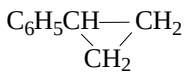
13. 完成下列反应式

(1) $CH_3CH_2CH_2CH_2I \xrightarrow[KOH]{CH_3CH_2OH} ? \xrightarrow[ROOR]{HBr} ?$

(2) $CH_3CH_2CH_2OH \xrightarrow[\triangle]{H_2SO_4} ? \xrightarrow{HOCl} ?$

(3)  $\xrightarrow{H_2SO_4} ? \xrightarrow{H-\overset{\overset{O}{\|}}{C}-OOH} \xrightarrow{H_2O} ?$

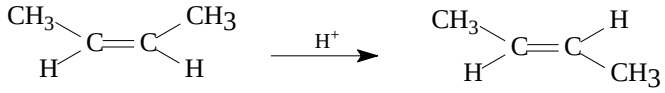
(4)  $\xrightarrow[hr]{Br_2} ? \xrightarrow[KOH]{CH_3CH_2OH} ? \xrightarrow[H_2O,\ OH^-]{KMnO_4} ?$

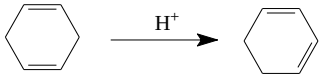
(5) 

(6) $CH_3CH_2C{\equiv}CH \xrightarrow{NaNH_2} ? \xrightarrow{C_2H_5Br} ? \xrightarrow[H_2]{Lindlar} ? \xrightarrow[CH_3OH]{H^+} ? \xrightarrow[OH^-]{NaBH_4} ?$

(7) $CH_3C{\equiv}CCH_3 \xrightarrow[NH_3(l)]{Na} ? \xrightarrow[Pd]{D_2} ?$

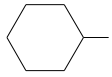
14. 对下述反应提出适当的反应机理

(1) 

(2) 

15. 讨论 2–甲基–1, 3–丁二烯与 HBr 在 1, 4 加成反应的主要产物

16. 完成下列反应式

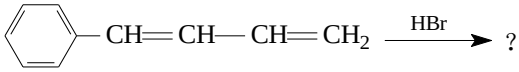
(1)  $\xrightarrow{H_2SO_4} ? \xrightarrow{PhCO_3H} ? \xrightarrow{H_3O^+} ?$

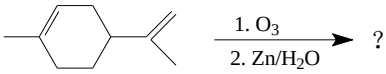
(2) $2HC{\equiv}CH \xrightarrow[Cu_2Cl_2]{NH_4Cl} ? \xrightarrow[H_2]{Lindlar\ Pd} ?$

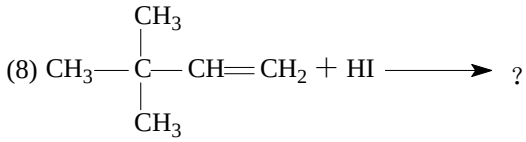
(3) $HC{\equiv}C-CH{=}CH_2 \xrightarrow[H_2SO_4]{HgSO_4,\ H_2O} ?$

(4) $CH_3CH{=}CHCH_2CH_3 \xrightarrow{Br_2} ? \xrightarrow[C_2H_5OH]{KOH} ?$

(5)  $\xrightarrow{Br_2} ? \xrightarrow[C_2H_5OH]{KOH} ?$

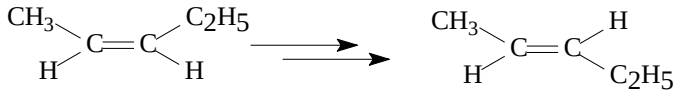
(6) 

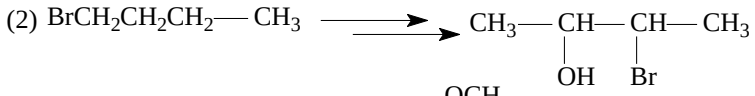
(7) 

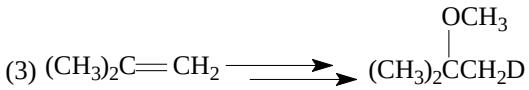
(8) 

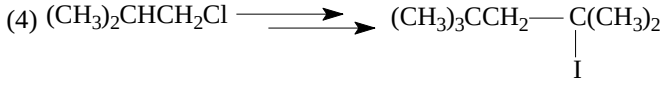
17．分别写出 2, 4–庚二烯和 2, 4–己二烯的顺反异构体

18．如何完成下列转变

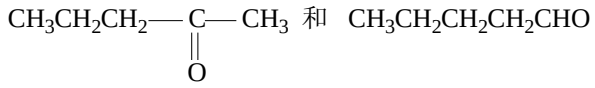
(1) 

(2) 

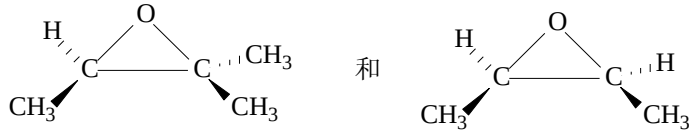
(3) 

(4) 

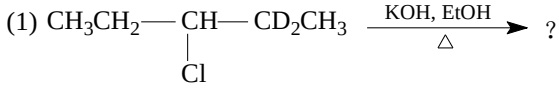
19．从不超过 3 个 C 原子的有机原料合成



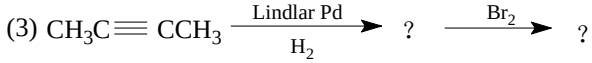
20．从 2–溴丁烷合成

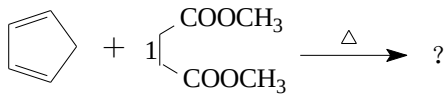


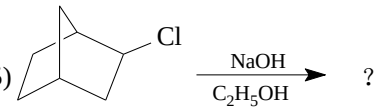
21．完成下列反应式

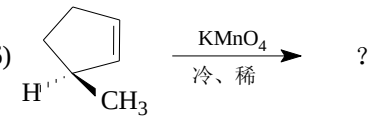
(1) 

(2) 

(3) 

(4)  ?

(5)  ?

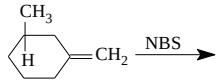
(6)  ?

22．如何完成下列转变

(1) $CH_3CH_2CH_2CH_2Br \longrightarrow CH_3CH_2C{\equiv}CCH_2CH_2CH_2CH_3$

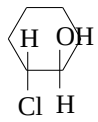
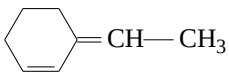
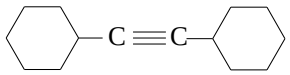
(2) $CH_3CH_2Br \longrightarrow CH_3-CH_2-\overset{\overset{O}{\|}}{C}-CH_2CH_2CH_3$

(3) $CH_3C{\equiv}CCH(CH_3)_2 \longrightarrow CH_3-\overset{\overset{O}{\|}}{C}-CH_2CH(CH_3)_2$

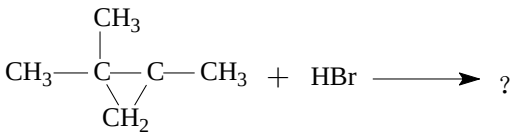
23．写出  的所有可能的产物。

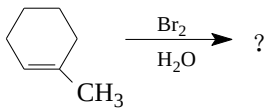
24．化合物（A）有一个手性 C 原子与 Br_2/CCl_4 反应生成三溴化合物（B）具有三个手性 C 原子，（A）与 C_2H_5ONa/C_2H_5OH 共热生成化合物（C），（C）无手性 C 原子，（C）与丙烯醛（$CH_2{=}CH{-}CHO$）共热生成分子式为 $C_7H_{10}O$ 的环状化合物（D）。试推测（A）～（D）的结构。

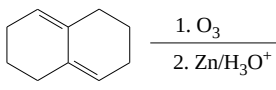
25．由  加必要的试剂合成

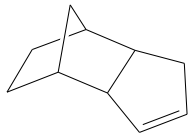
(1)  (2)  (3) 

26．完成下列反应式

(1) 

(2) 

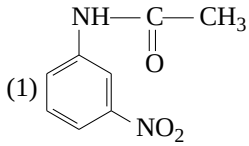
(3) 

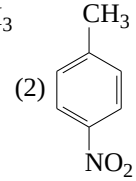
(4)  ?

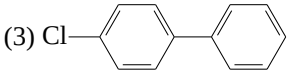
(5)  ? KMnO$_4$?

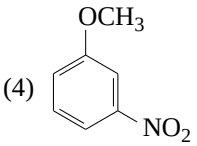
三、芳香族化合物

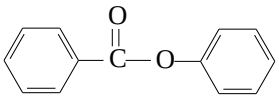
1．用箭头表示下列芳香族化合物在发生亲电子取代反应时，亲电试剂取代位置（主要产物）

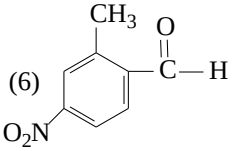
(1) 

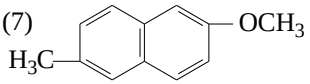
(2) 

(3) 

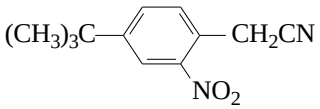
(4) 

(5) 

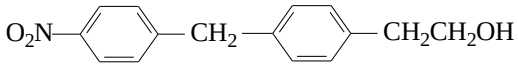
(6) 

(7) 

2．由甲苯和不超过四个碳的有机原料及无机试剂合成

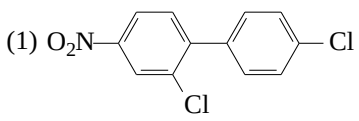


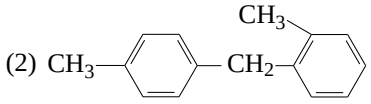
3．由苯、甲苯和不超过两个碳的有机原料及无机试剂合成

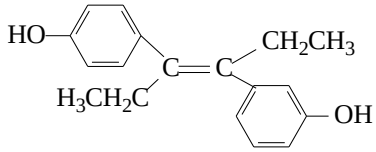


4．该烃经元素分析知 C：89.55%、H：10.45%，从质谱可知其分子量为 134，并存在苯环，该烃的一溴取代物可以分离到五个异构体，试推测该烃的结构

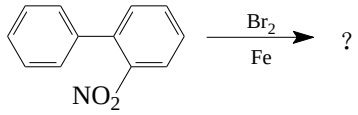
5．用系统命名法命名下列化合物

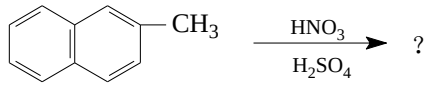
(1) 

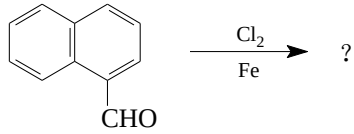
(2) 

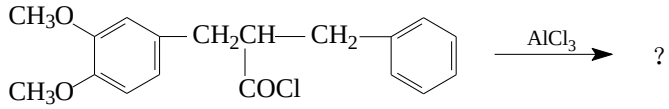
(3)  (E)

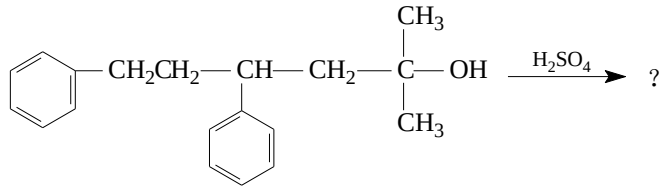
6．完成下列反应式

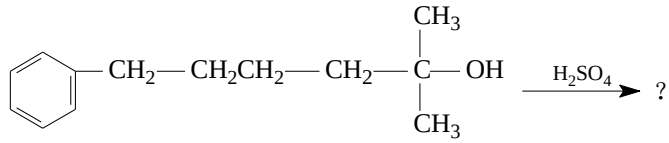
(1) 

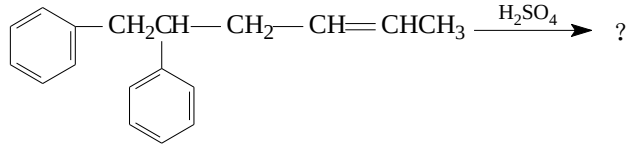
(2) 

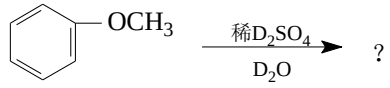
(3) 

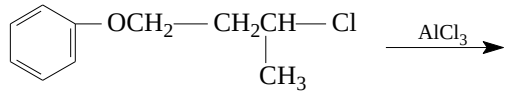
(4) 

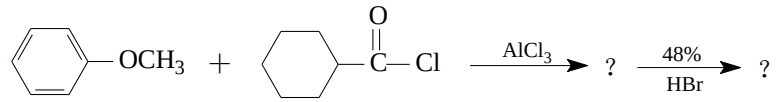
(5) 

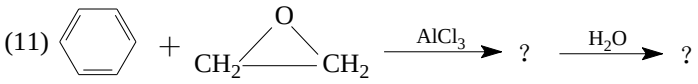
(6) 

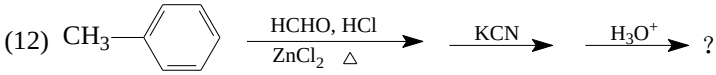
(7) 

(8) 

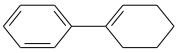
(9) 

(10) 

(11) 

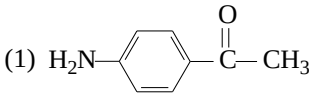
(12) 

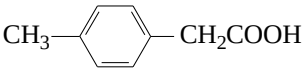
7. 用芳环取代反应，写出由苯及不超过三个 C 原子的有机原料合成正丙基苯的三种不同方法。

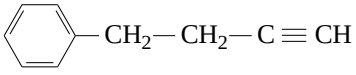
8. 写出由苯及适当的试剂合成  的两种方法

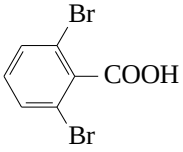
9. 以甲苯为原料合成 (1) 对溴苯甲酸；(2) 间溴苯甲酸；(3) 邻溴苯甲酸。

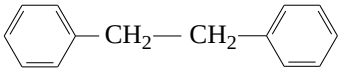
10. 以苯或甲苯为原料，合成下列化合物

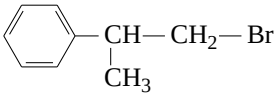
(1) 

(2) 

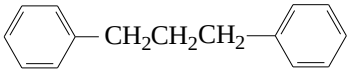
(3) 

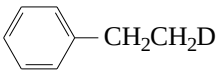
(4) 

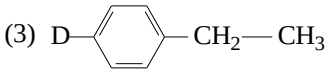
(5) 

(6) 

11. 以苯及不超过 2 个 C 原子的有机原料合成

(1) 

(2) 

(3) 

12. 请推测符合下列条件芳香族化合物的结构式

(1) 分子式为 C_8H_{10} 仅能生成一种一硝化产物

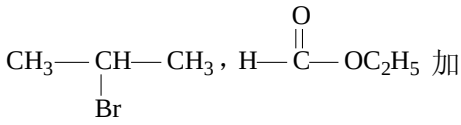
(2) 分子式为 $C_6H_3Br_3$ 能生成三种一硝化产物

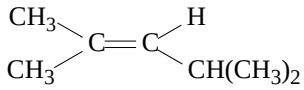
(3) 分子式为 $C_{10}H_{14}$ 不能被强氧剂氧化成芳香族羧酸

(4) 分子式为 $C_{10}H_{14}$ 有六个可能的一溴取代物（光照下发生），其中有两个一溴取代物可拆分为一对对映体，该化合物经氧化后生成一个酸性物质 $C_8H_6O_4$；后者只有一种硝化产物 $C_8H_5NO_6$。

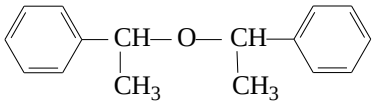
13. 化合物（A），分子式为 $C_{16}H_{16}$，能使 Br_2/CCl_4 及冷稀 $KMnO_4$ 溶液褪色。在温和条件下催化加氢，（A）能与等物质量的氢加成。用热的 $KMnO_4$ 氧化时，（A）只能生成一种二元酸 $C_6H_4(COOH)_2$，其一硝化取代物只有一种，推测（A）的构造式。

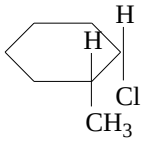
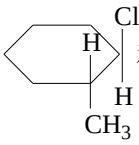
四、卤代烃、醇、醚

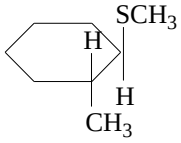
1. 由  加必要无机试剂合成



2．由苯及不超过 2 个 C 原子的有机物合成

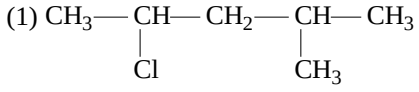


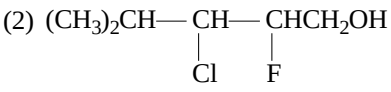
3. 试分别用(1)  (2)  和CH_3SNa为原料及其它必要试剂合成

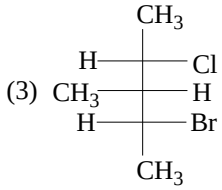


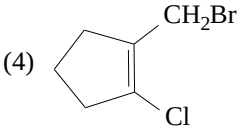
4．化合物（A），分子式为 $C_5H_{10}O$，不溶于水，与溴的四氯化碳溶液和金属钠都没有反应，与稀盐酸或稀氢氧化钠溶液反应，得到同一化合物（B），分子式为 $C_5H_{12}O_2$，（B）与等物质量的 HIO_4 水溶液反应得到 HCHO 和化合物（C），分子式为 C_4H_8O，（C）可发生碘仿反应，请推测（A）、（B）、（C）构造式。

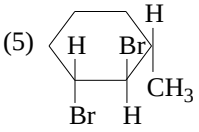
5．用系统命名法命名下列化合物

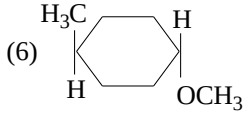
(1) 

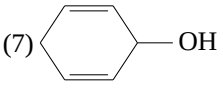
(2) 

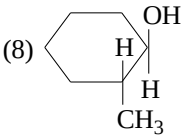
(3) 

(4) 

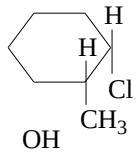
(5) 

(6) 

(7) 

(8) 

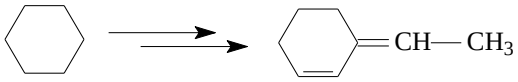
(9) $C_6H_5C(CH_2CH{=}CH_2)_2$, OH

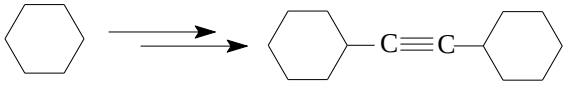
(10) 

(11) $CH_3C{\equiv}C{-}C(CH_3)_2{-}CH_2OH$

(12) $CH_3{-}C(OH)(CH_3){-}CH_2CH_2{-}OCH_3$

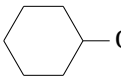
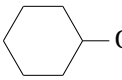
6．如何实现下列转变

(1) 

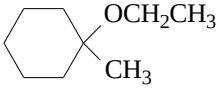
(2) 

7．从指定原料合成下列化合物

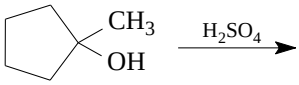
(1)  合成环己二醇

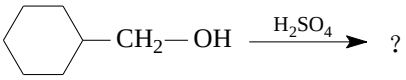
(2) 从  合成  和 

(3) 从 1-戊醇合成 $CH_3CH(D)CH_2CH_2CH_3$ 和 $DCH_2CH_2CH_2CH_2CH_3$

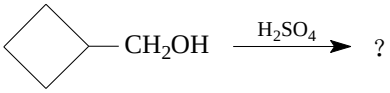
(4)  合成 

8．写出下列醇在浓 H_2SO_4 存在下脱水的主要产物

(1) 

(2) 

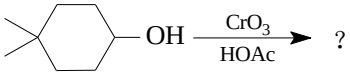
(3) $(CH_3)_3CCH_2OH \xrightarrow{H_2SO_4}$?

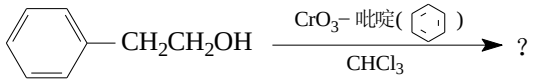
(4) 

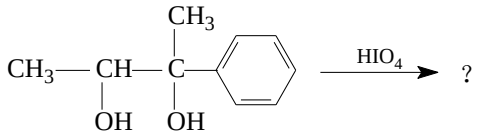
9．由 1-甲基环己醇为原料，合成

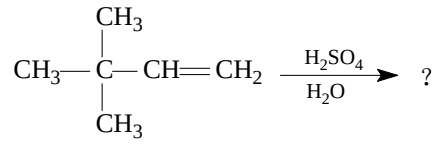
(1) 1-甲基-1-溴-环己烷　　(2) 1-甲基-2-溴-环己烷

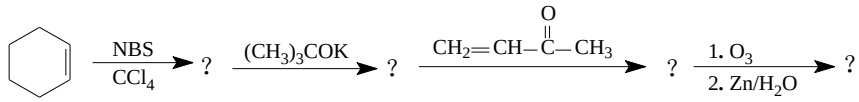
10．完成下列反应式

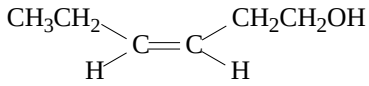
(1) 

(2) 

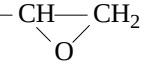
(3) 

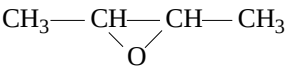
(4) 

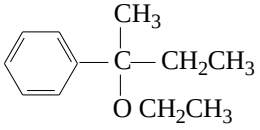
(5) 

11. 

（Cis–3–己烯–1–醇）具有绿色植物的清香气味，请试用乙炔为原料及其它必要试剂合成。

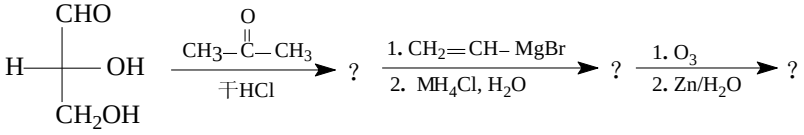
12. 从不超过2个C原子的有机化合物为原料合成 

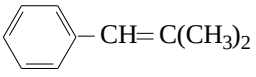
和 

13. 从不超过 2 个 C 原子的原料和苯合成 

五、醛、酮

1．完成下列反应式

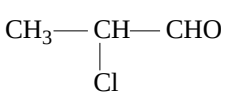


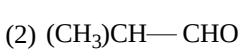
2. 由甲苯及不超过 3 个 C 原子的有机化合物为原料合成 

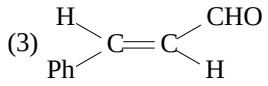
3．化合物（A），分子式为 $C_{10}H_{16}O$，与吐伦试剂作用生成银镜，（A）经 Ni 催化加氢可

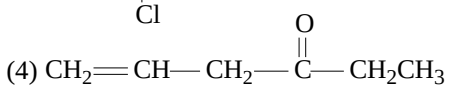
先后得到化合物（B），分子式为 $C_{10}H_{20}O$ 和化合物（C），分子式为 $C_{10}H_{22}O$，（A）经 O_3，Zn/H_2O 处理得到乙二醛、丙酮和化合物（D），（D）被 $AgNO_3$ 的氨水溶液氧化为化合物（E），分子式为 $C_5H_8O_3$，（E）经 I_2—NaOH 溶液作用生成碘仿，（A）与 H_2SO_4 共热可得到对异丙基甲苯，请推测（A）的结构式，并写出各步反应。

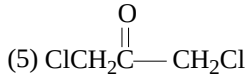
4．将下列醛、酮分别用普通命名法和系统命名法命名

(1) 

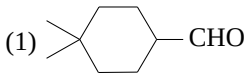
(2) 

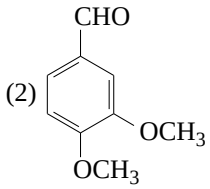
(3) 

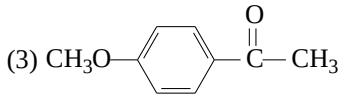
(4) 

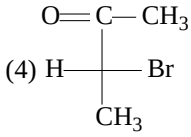
(5) 

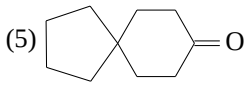
5．用系统命名法命名下列化合物

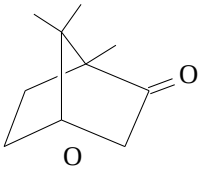
(1) 

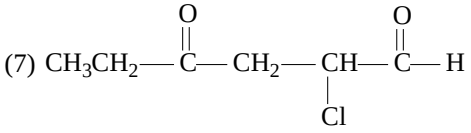
(2) 

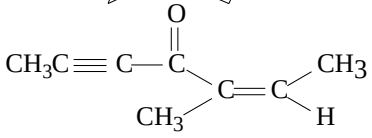
(3) 

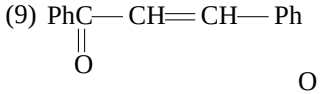
(4) 

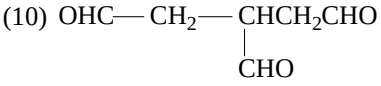
(5) 

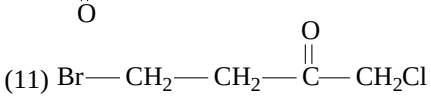
(6) 

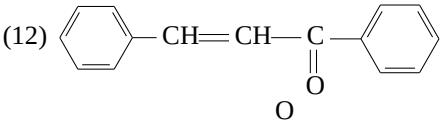
(7) 

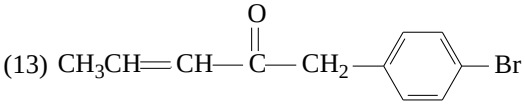
(8) 

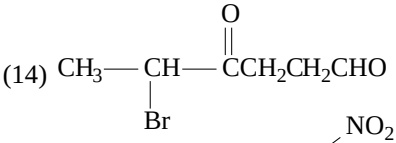
(9) 

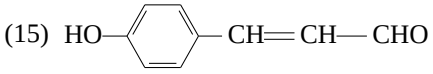
(10) 

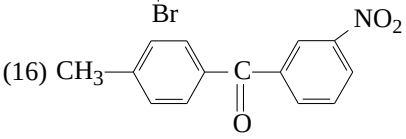
(11) 

(12) 

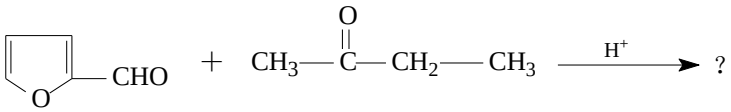
(13) 

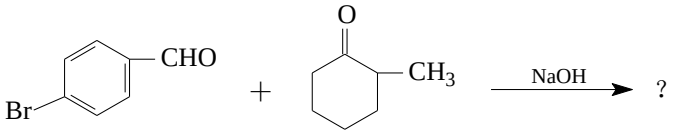
(14) 

(15) 

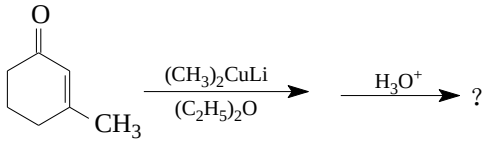
(16) 

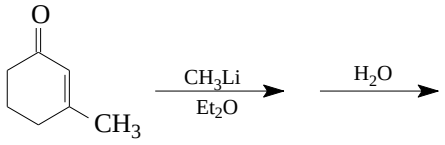
6．完成下列反应式

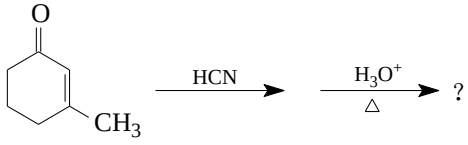
(1) 

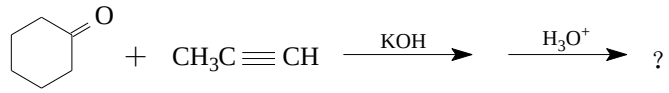
(2) 

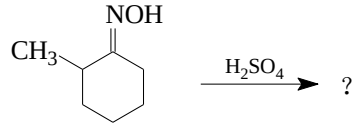
(3) $(CH_3)_3CHCHO$ + HCHO（过量） $\xrightarrow{K_2CO_3}$?

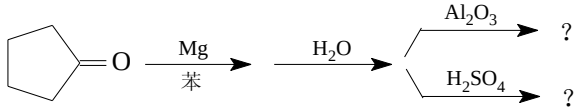
(4) 

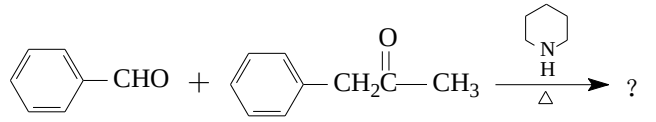
(5) 

(6) 

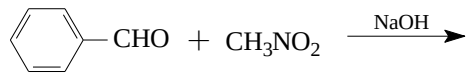
(7) 

(8) 

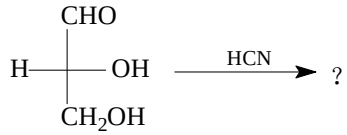
(9) 

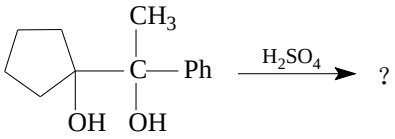
(10) 

(11) $CH_3CH_2OH \xrightarrow[\triangle]{H_2SO_4}$? $\xrightarrow{PhCOOOH}$? $\xrightarrow{C_6H_5MgBr}$ $\xrightarrow{H_3O^+}$? $\xrightarrow[N]{CrO_3}$?

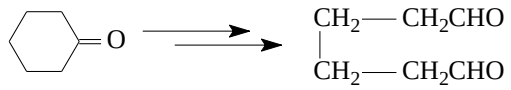
(12) 

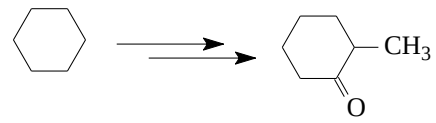
7．写出下列反应的主要产物

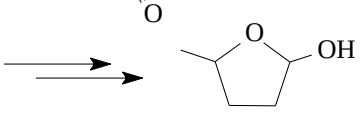
(1) 

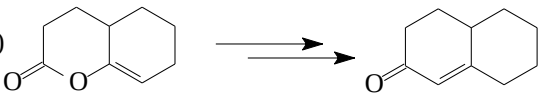
(2) 

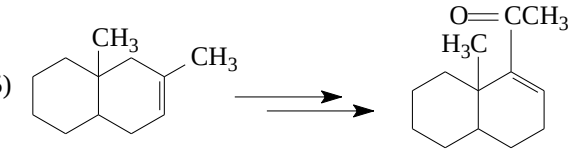
8．如何完成下列转变

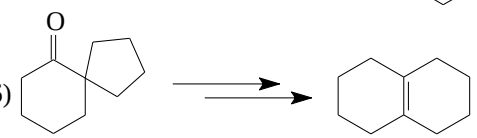
(1) 

(2) 

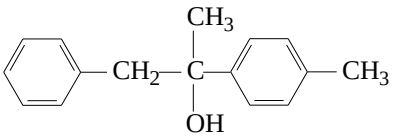
(3) ClCH2CH2CHO 

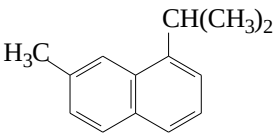
(4) 

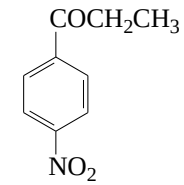
(5) 

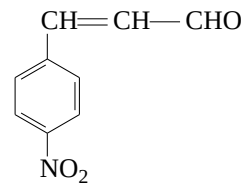
(6) 

9．以甲苯及必要的试剂合成下列化合物

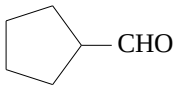
(1) 

(2) 

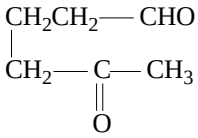
(3) 

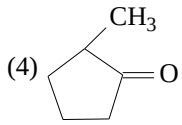
(4) 

10．以环戊烷及不超过 2 个 C 原子的有机原料合成下面化合物

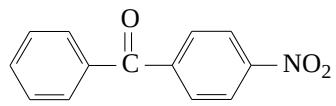
(1) 

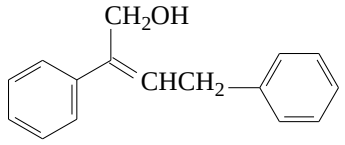
(2) $CH_2(CH_2CHO)_2$

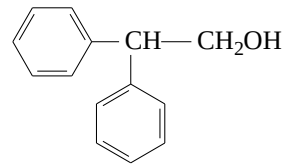
(3) 

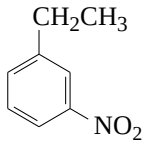
(4) 

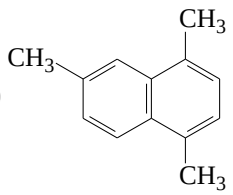
11．从苯、甲苯及其它易得有机试剂合成下列化合物

(1) 

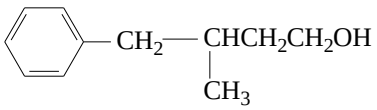
(2) 

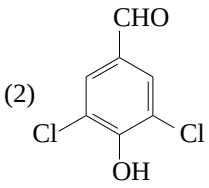
(3) 

(4) 

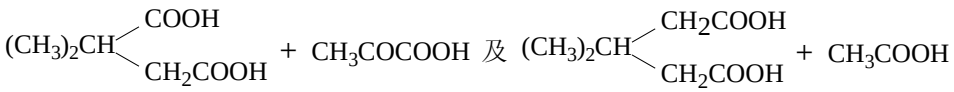
(5) 

12．由苯及不超过 3 个 C 原子的有机物化合物合成

(1) 

(2) 

13．化合物（A），分子式为 $C_{10}H_{16}O$，可以和氨基脲（$NH_2-\overset{\overset{O}{\|}}{C}-NH-NH_2$）或羟胺（$NH_2OH$）反应，能使 Br_2/CCl_4 或冷稀 $KMnO_4$ 溶液褪色，与吐伦试剂不反应。（A）被选择性还原得到（B），分子式为 $C_{10}H_{18}O$，（B）与羟胺反应得到一个固体。但（A）不能使 Br_2/CCl_4 或冷稀 $KMnO_4$ 溶液褪色。（A）还可被还原到（C），分子式为 $C_{10}H_{20}O$，（C）不与羟胺反应，也不能使 Br_2/CCl_4 或冷稀 $KMnO_4$ 溶液褪色，但可以使 CrO_3/H^+ 溶液变绿。化合物（A）被强氧化剂氧化时可分别得到：

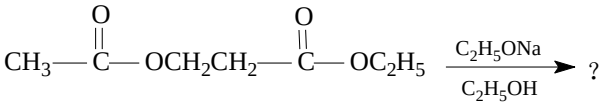


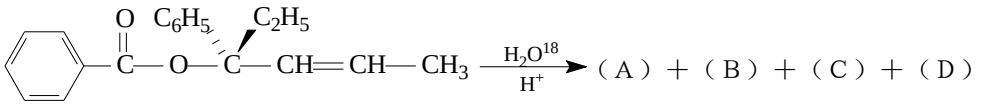
推测（A）、（B）、（C）的构造式，并写出其反应式。

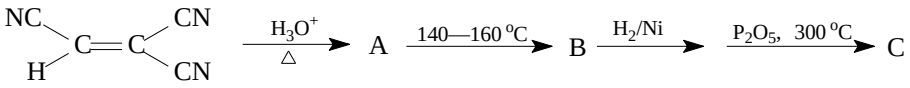
14．化合物（A），分子式为 $C_8H_{14}O$，能使 Br_2/CCl_4 溶液褪色，并与苯肼反应生成相应的腙。（A）经 $KMnO_4$ 氧化得到丙酮和化合物（B），（B）具酸性，（B）与 $NaOH—I_2$ 反应生成 CHI_3 黄色沉淀和丁二酸，试推测（A）的可能构造式，并写出相应反应式。

六、羧酸及其衍生物

1. 完成反应式

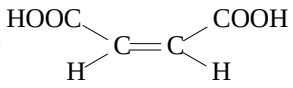


2. 

3. 

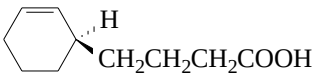
4. 用系统命名法命名下列各酸

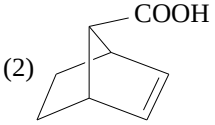
(1) CH_3COOH　　(2) CH_3CH_2COOH

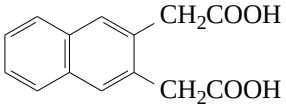
(3) HOOC—COOH　　(4) 

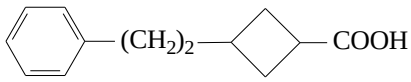
5. 写出所有分子式为 $C_5H_8O_2$，含有五元环内酯类化合物及名称

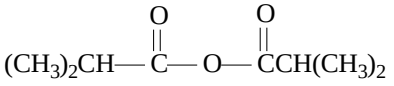
6. 用系统命名法命名下列化合物

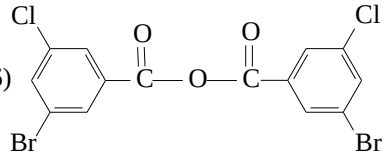
(1) 

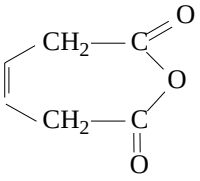
(2) 

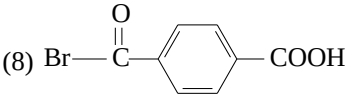
(3) 

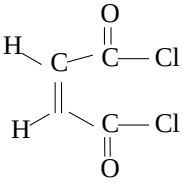
(4) 

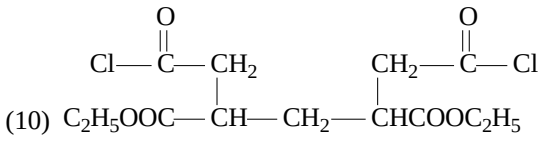
(5) 

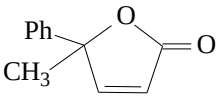
(6) 

(7) 

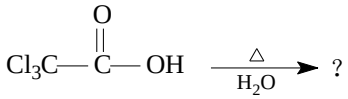
(8) 

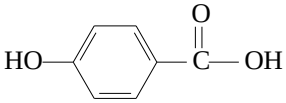
(9) 

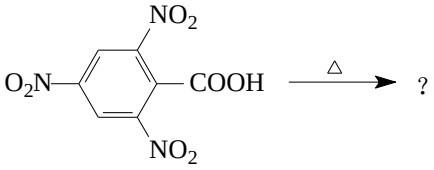
(10) 

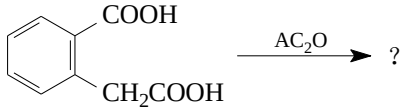
(11) 

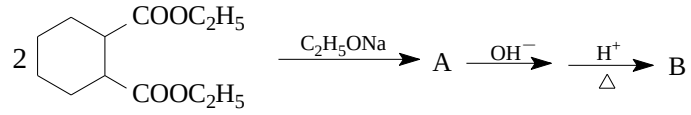
8．完成下列反应式

(1) 

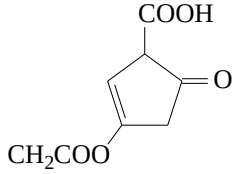
(2) 

(3) 

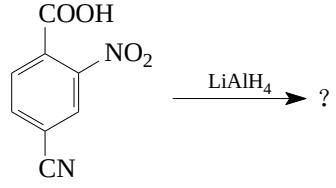
(4) 

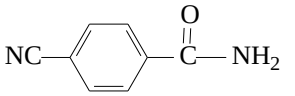
(5) 

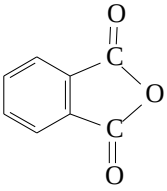
(6) $(CH_3)_2CH-CH=CH-CH_2COOH \xrightarrow{\triangle}$?

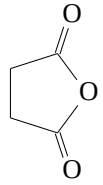
(7) 

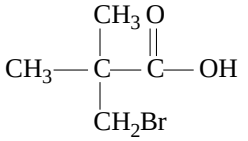
9．完成下列反应式

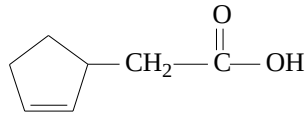
(1) 

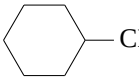
(2)  $\xrightarrow{LiAlH_4}$ A $\xrightarrow{AC_2O}$ B

(3)  $\xrightarrow[1mol]{C_2H_5OH}$ A $\xrightarrow{PCl_3}$ B $\xrightarrow[H_2]{Pd/BaSO_4}$ C

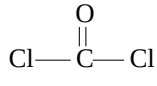
(4)  $\xrightarrow{LiAlH_4}$?

(5)  $\xrightarrow[CCl_4]{NaOH}$ A $\xrightarrow[H_2O]{NaOH}$

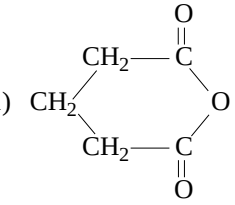
(6)  $\xrightarrow{H^+}$

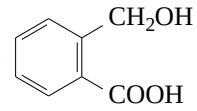
(7)  + 1HCHO $\xrightarrow{OH^-}$ A $\xrightarrow{HCN}$ B $\xrightarrow{H_3O^+}$ C

(8) $CH_3CH_2CH_2COOH + Cl_2 \xrightarrow{P}$ A $\xrightarrow[2.\ NaCN]{1.\ NaHCO_3}$ B $\xrightarrow{H_3O^+}$ C

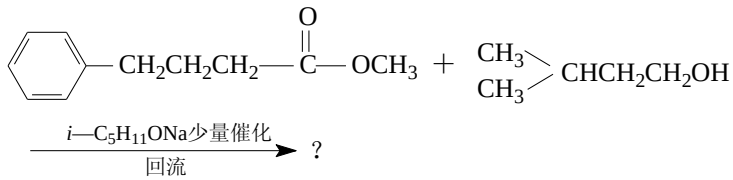
(9)  + C_2H_5OH（1mol） $\xrightarrow{NH_3}$ A $\xrightarrow[\triangle]{}$ B

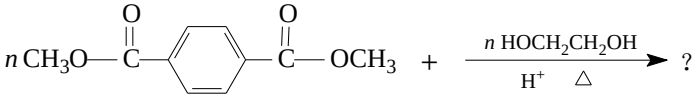
(10) $HCCl_3 + C_2H_5ONa$（足量） $\longrightarrow$ A $\xrightarrow{C_2H_5MgX}$ B

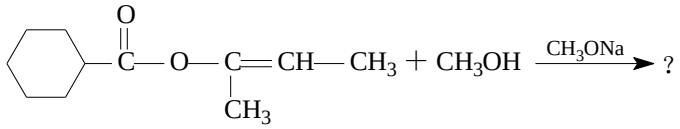
(11)  $\xrightarrow{C_2H_5OH（1mol）}$ A $\xrightarrow[P]{Cl_2}$ B $\xrightarrow{C_2H_5OH}$ C

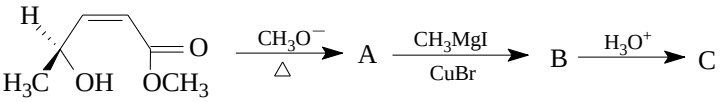
(12)  $\xrightarrow[\triangle]{H^+}$ A $\xrightarrow[\text{过量}]{CH_3MgI}$ $\xrightarrow{H_2O}$ B

10．完成下列反应式

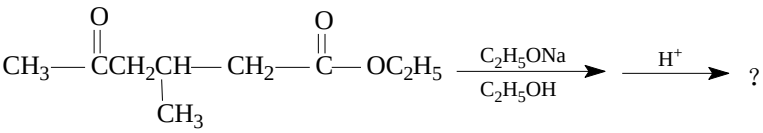
(1) 

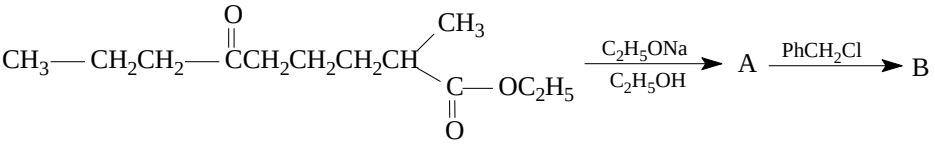
(2) 

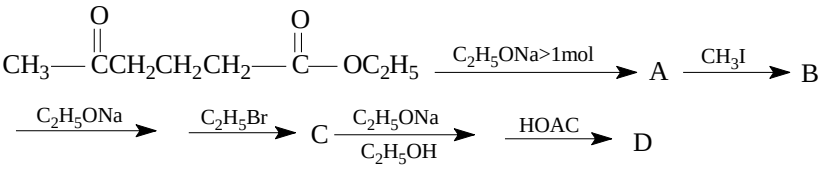
(3) 

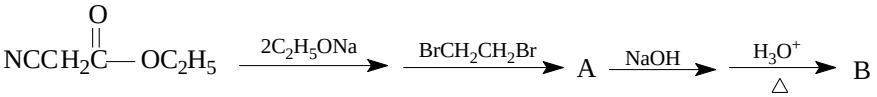
(4) 

11．完成下列反应式

(1) 

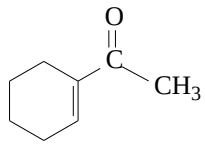
(2) 

(3) 

(4) 

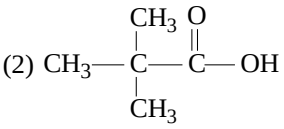
(5) $2CH_2(COOC_2H_5)_2 \xrightarrow[C_2H_5OH]{2C_2H_5ONa} \xrightarrow{BrCH_2CH_2Br} A \xrightarrow[C_2H_5OH]{C_2H_5ONa} \xrightarrow{ClCH_2CH_2Cl} B$

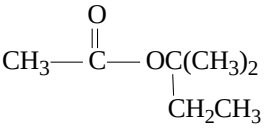
$\xrightarrow{OH^-} \xrightarrow[\triangle]{H^+} C \xrightarrow[\triangle]{300\,^oC} D$

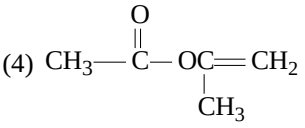
(6)  + $CH_3-\overset{O}{\overset{\|}{C}}CH_2-\overset{O}{\overset{\|}{C}}-OC_2H_5 \xrightarrow[C_2H_5OH]{NaOC_2H_5} A + B$

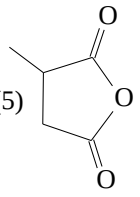
12．以丙酮、2 个 C 原子的有机物和任选无机试剂为原料合成

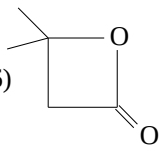
(1) $HOOC-CH_2-COOH$

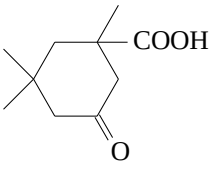
(2) 

(3) 

(4) 

(5) 

(6) 

(7) 

13． $CH_2=\overset{CH_3}{\overset{|}{C}}H-CHCOOH$ 在酸作用下得到两种产物，请写出两种产物的结构，哪一种产物是主要的。

14．蜂王浆可按如下方法合成：酮（A）$C_7H_{12}O$ 用 CH_3MgI 处理后水解生成醇（B）$C_8H_{16}O$，（B）经脱水成为烯烃（C）C_8H_{14}，（C）臭氧化然后还原水解得化合物（D）$C_8H_{14}O_2$。（D）与丙二酸二乙酯在碱中反应得到一个产物，此产物经热酸水解得到蜂王浆（E）$C_{10}H_{16}O_3$，（E）经催化氢化得到酮酸（F）$C_{10}H_{13}O_3$，（F）与碘在 NaOH 中反应后酸化得到碘仿与壬二酸，请写出（A）～（F）的结构。