

CHEMISTRY

BOOKS - CENGAGE CHEMISTRY (HINGLISH)

GRIGNARD REAGENTS AND ORGANOMETALLIC REAGENTS

Illustration

1. Explain why organocopper and organocadmium reagents react with less reactive acid chlorides even though they do not reacts with more reactive ketones.

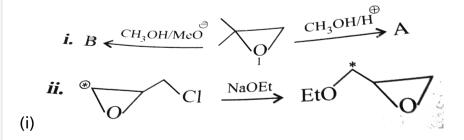


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- **2.** The reaction of $R'-\stackrel{\cap}{C}-Cl$ with R_2CuLi or R_2Cd gives a ketone, but with RMgX it gives a 3° alcohol.
- (a) Explain why RMgX reaction does not give ketone.
- (b) Account for the difference in behaviour of RMgX and R_2CuLi or R_2Cd .
- (c) What is the relationship between the reactivity of the organometallic compound and activity of the metal?

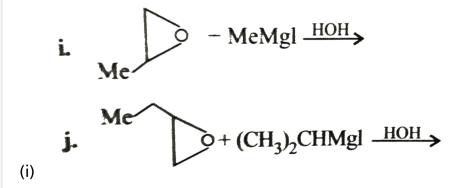


3. Explain or complete the following reactions.





- 4. Synthesise the following:
- (a) Benzyl alcohol from $G.\ R.$
- (b) 2-Methyl-2-phenyl propanol from $G.\ R.$
- (c) 2-Cyclopropyl ethanol from $G.\ R.$
- (d) lpha-Phenyl ethanol from MeMgl.
- (e) 2-Butanol from acetaldehyde
- (f) Triphenyl methanol from benzophenone
- (g) α, α -Diphenyl ethanol from acetophenone
- (h) 1-Cyclopropyl-1-phenyl ethanol from PhMgBr.





5. Complete the following reactions:

f.
$$O$$

$$Me + Et_2CuLi \xrightarrow{1. \text{ THF, } \Delta} (S)$$

$$(Q) \qquad (R)$$

$$(ii) \text{ THF, } \Delta$$

$$(iii) \text{ H3O} \qquad (R)$$

(T)

g.
$$CI$$
 $(CH_2)_4$
 O
 $Me + (W)$
 (V)
 (V)

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(b)

6. Complete the following reactions :

(a)
$$(A) \xrightarrow[i-BuBr]{1.Li} (B) \xrightarrow[2.CuI]{Ph-C-Cl} (C)$$

c.
$$C \equiv N$$
 + PhMgBr $\xrightarrow{1. \text{ THF, } \Delta}$ (H)
(G) (G)

b.
$$Ph$$

$$(D)$$

$$Me \xrightarrow{1.2 \text{ eq. BuL}i} (E)$$

$$d. Cl \xrightarrow{Cl} + Me_2CuLi \xrightarrow{1.THF, \Delta} (K)$$

$$(I)$$

$$(J)$$

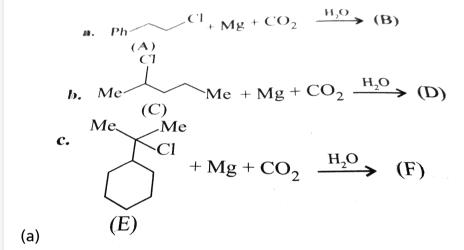
(b)





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7. Complete the following reactions:



 $PhCl + Mg + CO_2 \xrightarrow{H_2O} (H)$ $Mg + CO_2/H_2O$ Me $Mg + SO_2/H_2O$ (J) e. Ph $Mg + SO_3/H_2O$ (K) Me $Mg + CS_2/H_2O$ (L) **(1)** f. trans-4-Chloro methyl cyclohexane + Mg (N)+ CO₂—H_{2O} (O) $Mg + CO_2/H_2O$ $Mg + SO_2/H_2O$ (Q) $Mg + SO_3/H_2O$ (R) Br $Mg + CS_2/H_2O$ (S) (P) RMgBr + $CO_2 \xrightarrow{\text{Ether, } \Delta} V$ aleric acid h. (\mathbf{U}) RMgBr + CO₂ $\xrightarrow{\text{Ether, }\Delta}$ Caproic acid i. (W) (X) $Br + Mg \xrightarrow{H_2O} (Z)$ Br′ j٠ (Y) (d) $PhCl + Mg + CO_2 \stackrel{H_2O}{\longrightarrow} (H)$ (f) trans-4- $ext{Chloro}$ methyl cyclohexane $+Mg+CO_2 \stackrel{H_2O}{\longrightarrow} (O)$ (N)(h) $RMgBr + CO_2 \xrightarrow[H_2I]{Ether,\,\Delta} Valericacid.$ (U)(i) $RMgBr + CO_2 \xrightarrow{Ether, \, \Delta} Caproicacid.$ (X)(W)



(b)

(g)

8. Identify the products.

$$HO \xrightarrow{6} \xrightarrow{4} \xrightarrow{2} OEt \xrightarrow{\text{I mol of } \\ \text{MeMgBr}} (B) \xrightarrow{\text{I mol of } \\ \text{MeMgBr}} (C)$$

$$Ethyl-6-hydroxy-4-oxo- \\ \text{hexanoate} (E) \xleftarrow{\text{H}_3O^{\oplus}} (D) \xleftarrow{\text{2 mol of } \\ \text{MeMgBr}}$$



9. Complete the following reactions:

a. Me
$$\longrightarrow$$
 $\xrightarrow{\text{Cl}_2 + \text{FeCl}_3}$ $\xrightarrow{\text{NBS}}$ (B) $\xrightarrow{\text{Mg}}$ (C)

Toluene

Toluene

 $\downarrow 1$. Ethylene oxide

 $\downarrow 2$. $\downarrow \text{H}_3\text{O}^{\oplus}$
(D)

b.
$$Cl \xrightarrow{Ph_2Cd} (A)$$

Cyclopentylmethanoyl

chloride

c.
$$\frac{\text{Br}_2 + \text{FeBr}_3}{\text{dark}} \rightarrow \text{(A)} \xrightarrow{\text{ether, } \Delta} \text{(B)} \xrightarrow{\text{1. O}_2, \Delta} \text{(C)}$$

$$\downarrow 1. O_2, \text{ at } -70^{\circ}\text{C}$$

$$\downarrow 2. H_3\text{O}^{\oplus}$$

$$\downarrow \text{(D)}$$

d.

Me Mg Br +
$$C_2H_5$$
—O— C_2H_5 Ether, Δ
Propyl-
magnesium bromide

Diethyl
carbonate

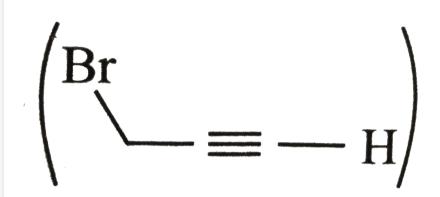
e. Me
$$OH \xrightarrow{\Delta} (A)$$

$$Propanol \longrightarrow Propanol \longrightarrow Me \longrightarrow Mg Br$$

$$e. Me$$

(1) (a)

(2) Why cannot be $G.\ R$ or lithium organometallic compounds of



prepared?



10. Complete the following reactions:

(a)

1
$$\xrightarrow{2}$$
 $\xrightarrow{4}$ + 1 mol Br₂ $\xrightarrow{\text{CH}_3\text{COOH}}$ (A) $\xrightarrow{\text{H}_2 + \text{Pt}}$ (B)
1.3-Butadicne $\xrightarrow{\text{Mg}}$ $\xrightarrow{\text{ether}}$ $\xrightarrow{\Delta}$ (F) $\xleftarrow{\text{Conc. H}_2\text{SO}_4}$ (D) $\xleftarrow{\text{(i)}}$ Methyl propanoate (C)

e. Me Me Me Me MeBr Ether,
$$\Delta$$
(b) (B) (C) + (D)



Solved Examples

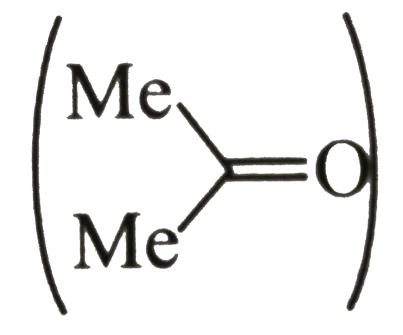
1.

$$(A) \xrightarrow{\text{Al}_2\text{O}_3} (B) (C_5\text{H}_{10}) \xrightarrow{\text{(i) HI}} (C)$$

$$(i) \text{B}_2\text{H}_6 \qquad Al_2\text{O}_3$$

$$(ii) \text{H}_2\text{O}_2, \text{OH} \qquad 150^{\circ}\text{C}$$

(A) and (C) are isomers, (B) can be obtained by the products of the reactions of EtMgBr and acetone

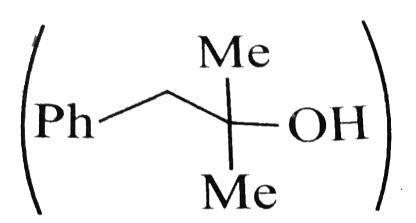


Give the

structures of (A), (B), and (C).



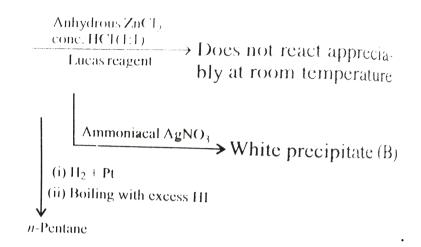
2. Two different $G.\,R.\,(A)$ and (B) give the product (X)



on reaction

with (C) and (D) respectively. Give the structures of (A), (B), (C) and (D).





A sample of 0.42gm os (A) with excess of MeMgBr gives 224ml of $CH_4(g)$ at $S.\ T.\ P$ Give the structure of (A) and write the equations involved.



3.

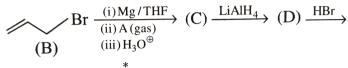
4. Identify the structures of (A) to (D).

$$(A) \xrightarrow{\text{Excess of HCl} \atop \text{+Benzoyl} \atop \text{peroxide}} (B) \xrightarrow{\text{Mg} \atop \text{dry ether}} (C) \xrightarrow{\text{(i) Ethyl acetate} \atop \text{(ii) H}_3O^{\oplus}} (D)$$



5. Identify (A) to (F) and mark the $C^{\,*}$ carbon in the entire scheme

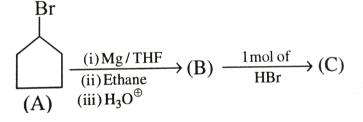
$$Ca\overset{*}{C}O_3 + H_2SO_4
ightarrow (A)(gas)igl[C^*denotesC^{14}igr].$$



(E)
$$\xrightarrow{O_3/\text{Red.}} {}^*\text{CH}_2 = \text{O} + (\text{F})$$



6. Identify (A) to (C).





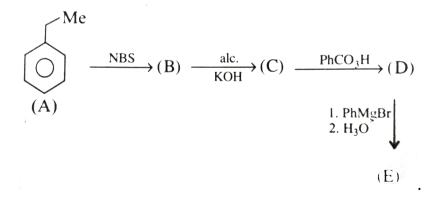
7. Identify (A) to (E).

$$Me \xrightarrow{(A)} -H \xrightarrow{MeMgBr} CH_4(g) + (B) \xrightarrow{(i)} \xrightarrow{(ii)} H_3O \oplus (C)$$

$$\xrightarrow{MeI} (D) \xrightarrow{Pd+BaSO_4} (E)$$



8. Identify (A) to (E).





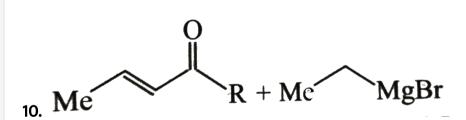
9. Identify (A) to (D).

Ester A (
$$C_7H_{14}O_2$$
) + 2MeMgBr $\xrightarrow{1.THF, \Delta}$ Alcohol B ($C_6H_{14}O$)

Conc. H_2SO_4

$$D (C_3H_6O) \xleftarrow{O_3/H_2O}$$
 C (C_6H_{12})

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How would the ratio of products change if.

(i)
$$R=Et$$

ii.
$$Me$$
 or $(iso-Pr)$

iii. Me or t -Bu

Me

(iii)



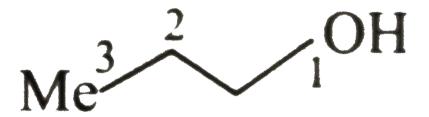
(iii)

$$CHD_{2}I \xrightarrow{?} \xrightarrow{?} \xrightarrow{?} D \longrightarrow OH$$

$$(A) \qquad \qquad H^{\oplus} \qquad (C) \qquad (D)$$

$$Major \qquad Minor$$

12. Starting with



(Propanol)



(ethanol). Prepare $pent-2-e \neq using \ G. \ R.$ Is there more than one way ? If so, which is the best and why ?



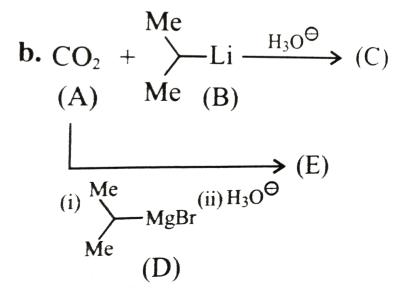
and

13. Complete the following reaction using G.R and any other compound.

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(a)

14. Complete the following reactions:

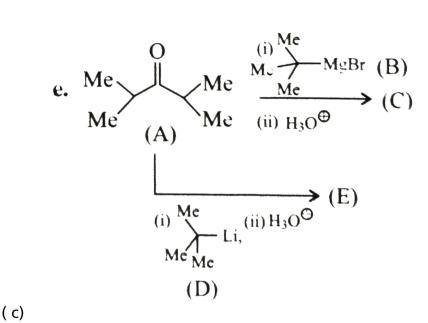


$$\mathbf{d.} \ CH_2 = C = O + \underbrace{\begin{array}{c} Me \\ Me \\ Me \end{array}}_{Me} (B) \xrightarrow{H_3O^{\odot}} (C)$$

$$(A) \qquad Me \qquad (B) \qquad (C) \xrightarrow{Me} (C) \xrightarrow{Me} (E)$$

$$(i) \xrightarrow{Me}_{Li} (ii) \xrightarrow{H_3O^{\odot}} (E)$$

$$(D)$$



g. Ethane nitrile

(A)

(i)
$$n$$
-C₄H₉MgBr, (ii) H₃O ^{\oplus}

(B)

(i) n -C₄H₉Li, (ii) H₃O ^{\oplus}

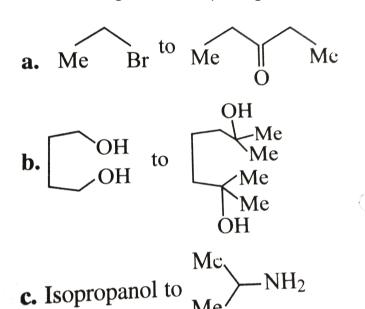
(E)

(D)

(d)

(b)

15. Convert the following reactions by using $G.\ R.$



(a)

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Exercises (Subjective)

1.
$$Me$$
OMe + 2 Me
 $MgBr$
 H_3O^{\oplus}

1.

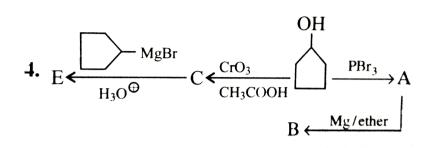


2. Ph—C—Cl+2
$$\xrightarrow{\text{MgCl}}$$

2.

3.
$$MgI + A$$
Me H_3O^{\oplus}



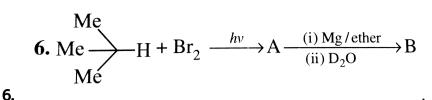


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5.
$$Me + Br_2 \xrightarrow{hv} A \xrightarrow{(i)Mg/ether} B$$

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5.





7.
$$B \leftarrow \underbrace{(i) MeMgBr}_{(ii) H_3O^{\oplus}} Acrolein \xrightarrow{LAH} A$$

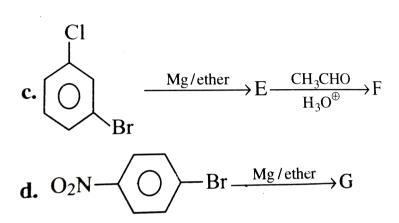
7.



b. // + HBr
$$\longrightarrow$$
 C $\xrightarrow{\text{(i) Mg/ether}}$ D

8. (a)

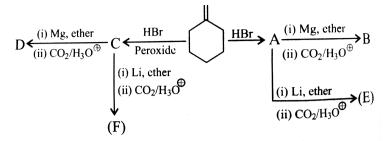
(b)



- (e) $PhMgBr \xrightarrow[H_3O^{\oplus}]{O_2}$?
- (f) $Phenol + RMgI \rightarrow ?$.



9.



9.

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10.

11. a. Ph—C
$$\equiv N \xrightarrow{(i) \text{MeM}_g Br} A$$

b. Ph

CHO

(ii) H₂O, H

(ii) H₂O

A

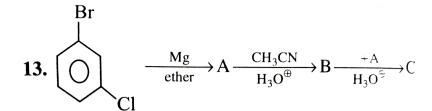
$$(i) \text{ MeLi} \rightarrow (B)$$

11. (a)



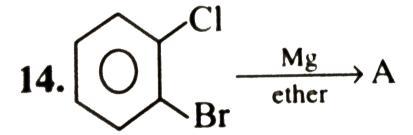
12. PhCH₃
$$\xrightarrow{\text{NBS}}$$
 A $\xrightarrow{\text{NaCN}}$ B $\xrightarrow{\text{H}_3O^{\oplus}}$ C

12.



13.

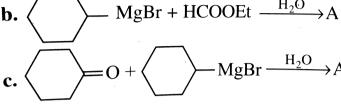




14.

15. (a)

$$Me - \stackrel{|}{C}Me(2 ext{mol}) + BrMgC \equiv C - MgBrovesetig(H_3O^\oplusig)(
ightarrow)A$$
 $egin{pmatrix} \mathbf{b.} & igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O & \mathbf{H}_2O \ \mathbf{A} & \mathbf{H}_2O \ \end{pmatrix} igg(egin{pmatrix} \mathbf{H}_2O \ \mathbf{H}_2O \$



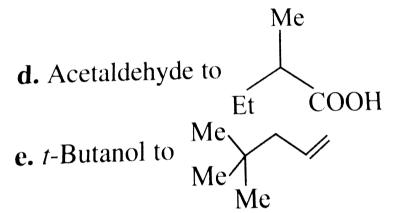


16. The reaction of Me_3CM_gCl and $Me_3C-C-Cme_3$ after hydrolysis gives a (A) and a 2° alcohol (B) rather than the expected tri-t-butyl carbinol. Provide the structures of (A) and (B) with explanation.

17. Convert of following:

b. Ethanol to

c. Acetic acid to Butan-2-one



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Exercises (Linked Comprehension)

1. In the following reaction sequence, the products (B) to (E) are

formed.

$$Me \xrightarrow{\int_{0}^{\infty} \frac{4}{5} \frac{3}{2}} \xrightarrow{\int_{0}^{\infty} \frac{1}{\text{CHO}}} (B) \xrightarrow{\text{HBr}} (C) \xrightarrow{\text{(i) Mg/ether}} (D)$$

$$(A) \xrightarrow{\text{(ii) Plane}} (C) \xrightarrow{\text{(ii) Mg/ether}} (D)$$

$$(B) \xrightarrow{\text{(iii) H3O}} (E)$$

$$(E)$$

The structure of product (B) is :

a. Me
$$\xrightarrow{Mc}$$
 $=$ OH

A.

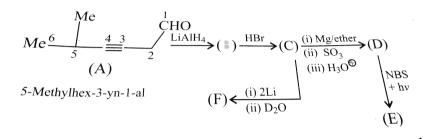
В.

c. Me
$$\stackrel{\text{Me}}{=}$$
 $\stackrel{\text{O}}{=}$ $\stackrel{\text{S}}{=}$ $\stackrel{\text{O}}{=}$ $\stackrel{\text{O}}{=}$

D.

2. In the following reaction sequence, the products (B) to (E) are

formed.



The structure of product (C) is :

A.

Answer: D



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3. In the following reaction sequence, the products (B) to (E) are formed.

$$Me \xrightarrow{\int_{0}^{\infty} \frac{4}{5}} \underbrace{\xrightarrow{\frac{1}{2}}_{0}^{\infty}} \underbrace{\xrightarrow{\text{LiAlH}_{4}}_{0}}_{\text{LiAlH}_{4}} (\text{b}) \xrightarrow{\text{HBr}}_{0} (\text{C}) \xrightarrow{\text{(i) Mg/ether}}_{\text{(ii) SO}_{3}} (\text{D})$$

$$(A) \xrightarrow{\text{LiAlH}_{4}}_{0} (\text{b}) \xrightarrow{\text{LiAlH}_{4}}_{0} (\text{b}) \xrightarrow{\text{HBr}}_{0} (\text{C}) \xrightarrow{\text{(ii) Mg/ether}}_{\text{(iii) SO}_{3}} (\text{D})$$

$$(F) \xleftarrow{\text{(ii) 2Li}}_{\text{(iii) D}_{2}\text{O}} (\text{E})$$

The structure of product (D) is :

a. Me
$$\stackrel{\text{Me}}{=}$$
 $\stackrel{\text{O}}{=}$ $\stackrel{\text{O}}{=}$ OH

A.

Answer: C



4. In the following reaction sequence, the products (B) to (E) are formed.

$$Me \xrightarrow{6} \xrightarrow{4} \xrightarrow{3} \xrightarrow{\text{CHO}} \xrightarrow{\text{LiAlH}_4} (\mathbb{B}) \xrightarrow{\text{HBr}} (C) \xrightarrow{\text{(i) Mg/ether}} (D)$$

$$(A) \xrightarrow{\text{(iii) SO}_3} \xrightarrow{\text{(iii) H}_3O^{\bigoplus}} \xrightarrow{\text{NBS}_+ \text{hiv}} (E)$$

The structure of product (E) is :

c. Me
$$\longrightarrow$$
 S \longrightarrow OH

Answer: C

C.



5. In the following reaction sequence, the products (B) to (E) are

formed.

$$Me \xrightarrow{6} \underbrace{\stackrel{1}{\underbrace{=}}} \underbrace{\stackrel{1}{\underbrace{=}}} \underbrace{\stackrel{CHO}{\underbrace{\text{LiAlH}_{4}}}} (\mathbb{B}) \xrightarrow{\text{HBr}} (C) \xrightarrow{\text{(i) Mg/ether}} (D)$$

$$(A) \xrightarrow{\text{(ii) SO}_{3}} (iii) \text{H}_{3}O^{\bigoplus}$$

$$(F) \xleftarrow{\text{(i) 2Li}} (ii) \text{D}_{2}O$$

$$(E)$$

The structure of product (F) is :

C.

Answer: D

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Br
$$\stackrel{5}{\stackrel{3}{\stackrel{}}}$$
 $\stackrel{1}{\stackrel{2}{\stackrel{}}}$ $\stackrel{2 \text{ alc. KOH}}{\stackrel{(i)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(i)}{\stackrel{}}}$ $\stackrel{(i)}{\stackrel{}}$ $\stackrel{2 \text{ HBr}}{\stackrel{(ii)}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(ii)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(ii)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(B)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(B)}{\stackrel{(B)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(B)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(B$

The structure of product (B) is :

Answer: C

6.



Br
$$\stackrel{5}{\stackrel{4}{\stackrel{}}}$$
 $\stackrel{3}{\stackrel{}}$ $\stackrel{1}{\stackrel{}}$ $\stackrel{2 \text{ alc. KOH}}{\stackrel{}}$ $\stackrel{(B)}{\stackrel{(i) 2HBr}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(i) Mg/ether}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(i) Mg/ether}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(B)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(B)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{}}$ $\stackrel{(B)}{$

The structure of product (C) is :

$$\begin{array}{c} \text{d. Br} \\ \text{D.} \end{array}$$

Answer: A



Br
$$\stackrel{5}{\stackrel{4}{\stackrel{}}}$$
 $\stackrel{3}{\stackrel{}}$ $\stackrel{1}{\stackrel{}}$ $\stackrel{2 \text{ alc. KOH}}{\stackrel{}}$ $\stackrel{(B)}{\stackrel{(i) 2HBr}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(i) Mg/ether}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(i) Mg/ether}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{(B)}{\stackrel{}}}$ $\stackrel{(B)}{\stackrel{}}$ \stackrel

The structure of product (D) is :

В.

Answer: D

D.

Br
$$\stackrel{5}{\stackrel{4}{\stackrel{}}}$$
 $\stackrel{3}{\stackrel{}}$ $\stackrel{1}{\stackrel{}}$ $\stackrel{2 \text{ alc. KOH}}{\stackrel{}}$ $\stackrel{(B)}{\stackrel{(i) 2HBr}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(i) (PhCO)_2O}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(i) Mg/ether}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(C)}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(C)}{\stackrel{(C)}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel{(C)}{\stackrel{(C)}{\stackrel{}}}$ $\stackrel{(C)}{\stackrel$

The structure of product (E) is :

9.

Answer: A

D.



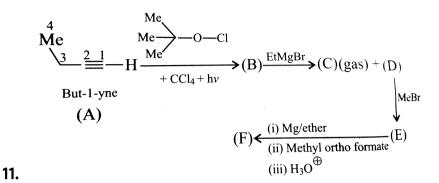
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Br
$$\stackrel{5}{\overset{3}{\overset{1}{\overset{2}{\text{alc. KOH}}}}}$$
 (B) $\stackrel{(i) \text{ 2HBr}}{\overset{(ii) \text{ (PhCO)}_2\text{O}}{\overset{(ii) \text{ (PhCO)}_2\text{O}}{\overset{(ii) \text{ Mg/ether}}{\overset{(ii) \text{ Mg/ether}}{\overset{(ii) \text{ HCOOEt}}{\overset{(iii) \text{ Phenol}}{\overset{(iii) \text{ H}_3\text{O}^{\oplus}}{\overset{(iii) \text{ H}_3\text{O}^{\oplus}}}{\overset{(iii) \text{ H}_3\text{O}^{\oplus}}{\overset{(iii) \text{ H}_3\text{O}^{\oplus}}{\overset{(iii) \text{ H}_3\text{O}^{\oplus}}}{$

The structure of product (F) is :

В.

D.



The structure of product (B) is :

A.
$$Me$$

$$D. Me$$

$$CI$$

$$E - CI$$

$$Me$$

$$CI$$

$$E - H$$

$$C \cdot CI$$

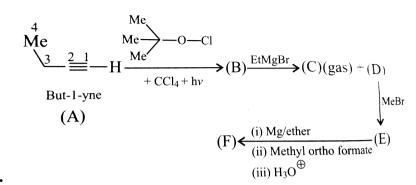
$$Me$$

$$E - O - Me$$

$$Me$$

$$Me$$

Answer: B



12.

The gas (C) is :

A. CH_4

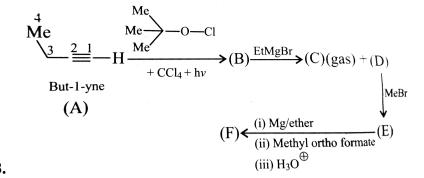
B. C_2H_6

 $C. C_2H_4$

D. Isobutene

Answer: B





13.

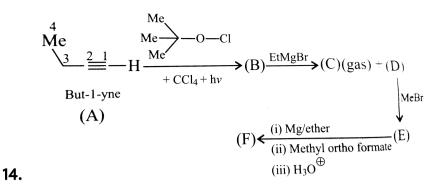
The structure of product (D) is :

$$c.$$
 Cl $=-MgBr$

d.
$$Me$$
 Me
 Me
 Me
 Me
 Me
 Me

Answer: B





The structure of product (E) is :

$$c. \stackrel{\text{Me}}{\longrightarrow} = -\text{Me}$$

$$\begin{array}{c}
\text{d.} \bigvee_{\text{Me}}^{\text{Me}} = -0 - \bigvee_{\text{Me}}^{\text{Me}} \\
\text{D.}
\end{array}$$

Answer: C



The structure of product (F) is :

Answer: C

15.



$$H \xrightarrow{O} NH_2 \xrightarrow{1 \text{ mol of } PhMgBr} (B) \xrightarrow{1 \text{ mol of } PhMgBr} (C) \xrightarrow{1 \text{ mol of } PhMgBr} (D)$$

$$(A) \qquad (E) \xleftarrow{H_3O^3}$$

16.

The structure of product (B) is :

A.

C

D.

Answer: C



$$H \xrightarrow{O} NH_2 \xrightarrow{1 \text{ mol of} \atop PhMgBr} (B) \xrightarrow{1 \text{ mol of} \atop PhMgBr} (C) \xrightarrow{1 \text{ mol of} \atop PhMgBr} (D)$$

$$(A) \qquad (E) \xleftarrow{H_3O^5}$$

The structure of product (C) is :

17.

Answer: A

D.



$$H \xrightarrow{O} NH_2 \xrightarrow{1 \text{ mol of } PhMgBr} (B) \xrightarrow{1 \text{ mol of } PhMgBr} (C) \xrightarrow{1 \text{ mol of } PhMgBr} (D)$$

$$(A) \qquad (E) \xleftarrow{H_3O^2}$$

The structure of product (D) is :

18.

Answer: B



$$H \longrightarrow NH_2 \xrightarrow{1 \text{ molof}} NH_2 \xrightarrow{1 \text{ molof}} (B) \xrightarrow{1 \text{ molof}} (C) \xrightarrow{1 \text{ molof}} (D)$$

$$(A) \qquad (E) \xleftarrow{H_1O^{\frac{1}{2}}}$$

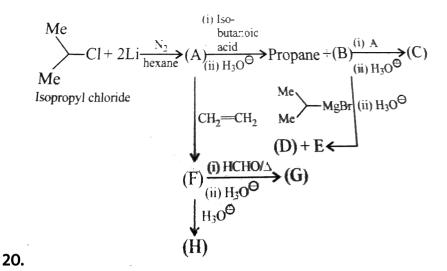
The structure of product (E) is :

19.

D. OH O OH
$$NH_2$$

Answer: B





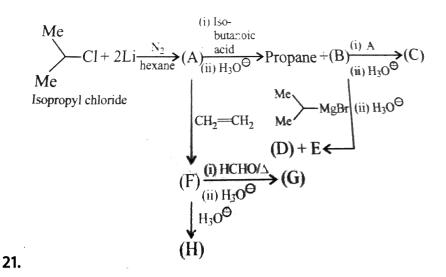
The structure of product (A) is :

- A. Isopropyl lithium
- B. Propyl lithium

D. Hexane

Answer: A





The structure of product (B) is :

Answer: B

Me

C1 + 2Li
$$\xrightarrow{N_2}$$
 (A) $\xrightarrow{\text{acid}}$ Propane + (B) $\xrightarrow{\text{(ii) A}}$ (C)

Me

Isopropyl chloride

CH₂—CH₂ Me

(B) $\xrightarrow{\text{(ii) H}_3O^{\Theta}}$ (C)

(C)

(B) $\xrightarrow{\text{(ii) H}_3O^{\Theta}}$ (C)

(C)

(D) + E

(F) $\xrightarrow{\text{(ii) H}_3O^{\Theta}}$ (G)

(H)

The structure of product (C) is :

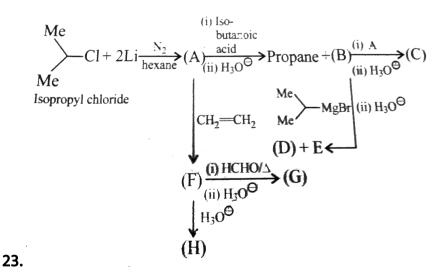
22.

В.

Answer: C



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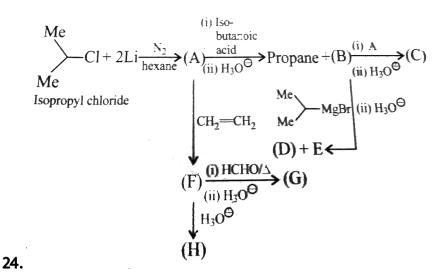


The structure of product (D) is :

Answer: D

D.





The structure of product (E) is :

Answer: A

D.

Me

C1 + 2Li
$$\frac{N_2}{\text{hexane}}$$
 (A) $\frac{\text{acid}}{\text{(ii) H}_3O^{\bigoplus}}$ Propane + (B) $\frac{\text{(i) A}}{\text{(ii) H}_3O^{\bigoplus}}$ (C)

Me

Isopropyl chloride

(F) $\frac{\text{(i) HCHO/}\Delta}{\text{(ii) H}_3O^{\bigoplus}}$ (G)

 $\frac{\text{(ii) Iso-butanoic}}{\text{(iii) H}_3O^{\bigoplus}}$ (G)

 $\frac{\text{Me}}{\text{(ii) H}_3O^{\bigoplus}}$ (G)

(H)

The structure of product (F) is :

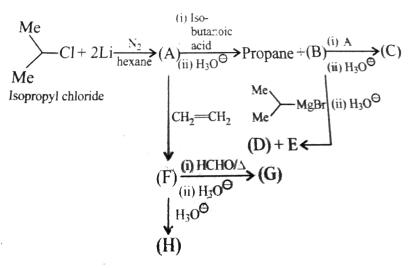
25.

D. None of these

Answer: B



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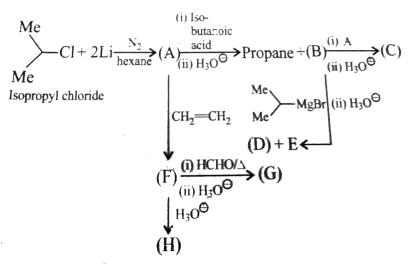
26.

The structure of product (G) is :

Answer: A

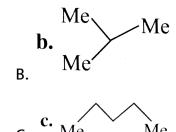


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27.

The structure of product (H) is :



Answer: A



28.

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Et—
$$\overset{\oplus}{N} \equiv \overset{\ominus}{C} \xrightarrow{\text{(i) PrMgBr/ether}} (B) \xrightarrow{\text{Dil. HCl}} (C) + (D)$$

(A)

$$\overset{(i) PrMgBr/ether}{(ii) H_3O^{\oplus}} (E)$$

(E)

$$\overset{(i) PrMgBr/ether}{(ii) H_3O^{\oplus}} (E)$$

(E)

The compound (B) is :

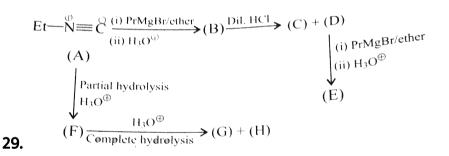
A.
$$Et-N-CH=O$$
 $\underset{Pr}{\mid}$

B.
$$Et - N = Ch - Br$$

Answer: B



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The compounds (C) and (D), respectively, are :

A.
$$EtNH_2$$
 and $PrCH=O$

B.
$$Et-NH-Pr$$
 and $HCOOH$

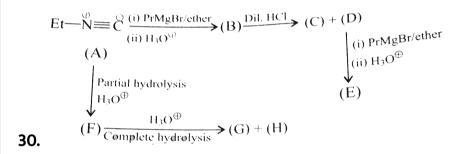
C.
$$PrNH_2$$
 and $EtCH = O$

D. $EtNH_2$ and $PrCH_2OH$.

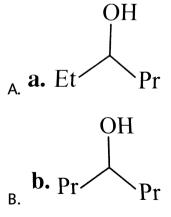
Answer: A



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The structure of product (E) is :



Answer: B



31.

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Et—
$$\mathbb{N} \equiv \mathcal{E} \xrightarrow{\text{(i) PrMgBr/ether}} (B) \xrightarrow{\text{Dil. HCl}} (C) + (D)$$

(A)

$$(A) \qquad \qquad \text{(ii) PrMgBr/ether}$$

(A)

$$(A) \qquad \qquad \text{(ii) PrMgBr/ether}$$

(ii) H_3O^{\oplus}

(E)

$$(F) \xrightarrow{\text{Complete hydrolysis}} (G) + (H)$$

The compound (F) is :

- A. N-Ethyl methanamide
- B. N-Propylmethanamide

- C. N-Ethylbutanamide
- D. N-Propylpropanamide

Answer: A



32.

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$$Et \longrightarrow \stackrel{\circ}{N} \equiv \stackrel{\circ}{C} \xrightarrow{(i) \text{ PrMgBr/ether}} (B) \xrightarrow{\text{Dil. HCl}} (C) + (D)$$

$$(A) \qquad \qquad \downarrow \text{(ii) PrMgBr/ether}$$

$$(A) \qquad \qquad \downarrow \text{(ii) PrMgBr/ether}$$

$$(B) \xrightarrow{\text{(ii) PrMgBr/ether}} (B) \xrightarrow{\text{(iii) H}_{3}O^{\oplus}} (C) + (D)$$

$$(F) \xrightarrow{\text{H}_{3}O^{\oplus}} (C) \xrightarrow{\text{PrMgBr/ether}} (C) + (D)$$

$$(E) \xrightarrow{\text{(iii) H}_{3}O^{\oplus}} (C) \xrightarrow{\text{(iii) H}_{3}O^{\oplus}} (C) + (D)$$

The compounds (G) and (H), respectively, are :

- A. Propanamide and $CH_2=O$
- B. Ethylamine and $CH_2=O$
- C. Ethylamine and HCOOH
- D. Propanamide and HCOOH

Answer: C



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33.

Which of the following statements is//are correct?

- A. When G.~R reaction with alkyl isocyanide, of electrophile $\begin{pmatrix} \oplus \\ MgX \end{pmatrix}$ first adds of the C atom of $\begin{pmatrix} \oplus \\ N \equiv C \end{pmatrix}$ group and then the nucleophile $\begin{pmatrix} R \ddot{\Theta} \end{pmatrix}$ adds of the same C atom.
- B. When G.~R reacts with alkyl isocyanide, the nucleophile $\left(R^{\ddot{\Theta}}\right)$ first adds to the C atom of $\left(\stackrel{\oplus}{N}\equiv\stackrel{\Theta}{C}\right)$ group and then the electrophile $\left(\stackrel{\oplus}{M}gX\right)$ adds to the same C atom.
- C. When G. R reacts with alkyl isocyanide, electrophile $\begin{pmatrix} \oplus \\ MgX \end{pmatrix}$ adds to the C atom of $\begin{pmatrix} & \oplus \\ N & \equiv & C \end{pmatrix}$ group and the

nucleophile $\left(R^{\ddot{\Theta}}\right)$ adds of the N atom.

D. when alkyl isocyanide is hydrolysed in dilute acidic medium.

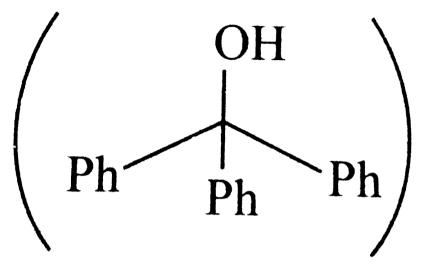
$$H^{\,\oplus}$$
 (electrophile) adds to the C atom of $\left(-\stackrel{\oplus}{N}\equiv\stackrel{\Theta}{C}
ight)$

group and then OH (nuclephile) adds to the same ${\cal C}$ atom.

Answer: A::B



Exercises (Multiple Correct)



be

can

obtained by the reaction of PhMgBr and.

- A. Ethyl carbonate
- B. Benzophenone
- C. Ethyl benzoate
- D. Benzamide

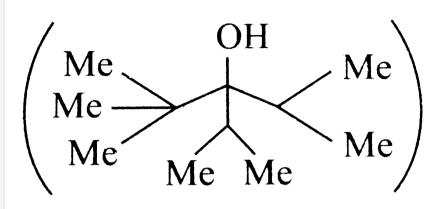
Answer: A::B::C



Α

 3°

alcohol



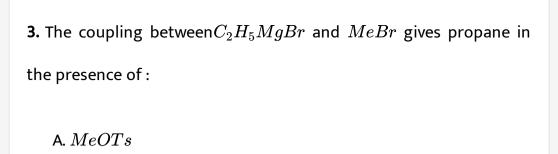
can be

obtained by the reaction of ketone (di-isopropyl ketone) and.

- A. Isopropyl magnesium bromide
- B. Isopropyl lithium
- C. Di-isopropyl cadmium
- D. Di-isopropyl zinc

Answer: B





B. EtOTs

C. AgBr

D. $CuCl_2$

Answer: A::B::D



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4. Which of the following halides does not form $G.\ R$ when treated with magnesium in the presence of ether ?

A.
$$a.^{\mathrm{DI}} = -\mathrm{H}$$

C. $C \cdot O_2 N \longrightarrow Br$ D. $C \cdot O_2 N \longrightarrow Br$

Answer: A::B::C::D



5. Which of the following halides does form G. R when treated with magnesium in the presence of ether ?

A. PhBr

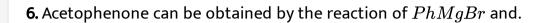
B. b. Br

c. Br

D. d. H_2N \bigcirc B

Answer: A::B::C

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|-------------|----------|
|-------------|----------|



- A. Ethane nitrile
- B. Ethanamide
- C. Ethanoyl chloride
- D. Methanamide

Answer: A::B



7. Hexan-3-one can be obtained by the reaction of EtMgBr and.

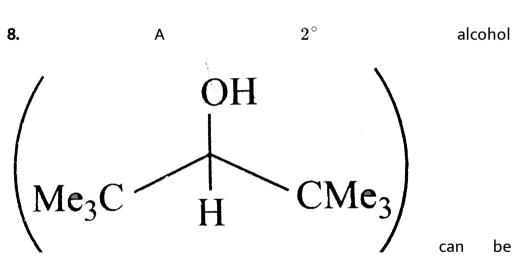
- A. Butanamide
- B. Propanamide

- C. Butane nitrile
- D. Propane nitrile

Answer: A::C



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obtained by the reaction of di-t-butyl ketone and

- A. Isopropyl magnesium bromide
- B. t-Butyl magnesium bromide

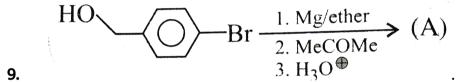
C. EtMgBr

D. MeMgBr

Answer: A::B::C



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The

1 (4) *

compound
$$(A)$$
 is :

D. None of these

Answer: D



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10. Which of the reagents is the most suitable for the following reaction?

$$Me \xrightarrow{Me} Me \xrightarrow{Me} OH$$

$$Me \xrightarrow{Me} Me$$

$$Me$$

A.
$$Me-C\equiv N$$

$$\mathbf{d}$$
. Me NH_2

Answer: C



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11. Which of the following would give benzene when reacted with

PhMgBr?

B. H_2

C. Methyl amine

D. NH_3

Answer: A::B::C::D



12. $EtNH_2 + MeMgI \xrightarrow{\text{Heated at high temp.}} Gas(A)$ The volume of gas (A) obtained at $S.\ T.\ P$ when 0.45gm of $EtNH_2$ reacts with MeMgI is.

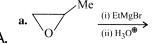
- A. 224ml
- B. 22.4ml
- $\mathsf{C.}\,448ml$
- D. 44.8 ml`

Answer: C



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13. Which of the following reactions would give $pen \tan - 2 - ol$?



c. Me
$$\stackrel{\text{Br}}{\underset{\text{(ii) } Q_2}{\text{Me}}}$$
 $\stackrel{\text{(i) } Mg/\text{ether}}{\underset{\text{(iii) } Q_3}{\text{(iii) } H_3O^{\oplus}}}$

D.
$$MeCHO \xrightarrow{PrmgBr/ether} H_{3O^{\oplus}}$$

Answer: A::B::C::D



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14. Which of the following reactions would give caproic acid?

A.
$$n-C_5H_{11}Br \xrightarrow{(\,i\,)\,Mg\,/\,ether} \stackrel{(\,i\,)\,Mg\,/\,ether}{(\,ii\,)\,CO_2}$$

B.
$$n-C_5H_{11}Li \xrightarrow{(i)\,CO_2}_{(ii)\,H_3O}$$

C.
$$n-C_4H_9Br \xrightarrow{(i)\,Mg\,/\, ext{ether}} (i)\,CO_2 \ (iii)\,H_3O^\oplus$$

D.
$$n-C_5H_{11}MgBr+\left(CN
ight)_2 \stackrel{(i)\;\Delta}{\longrightarrow \atop (ii)\;H_3O^\oplus}$$

Answer: A::B

C1

O

I mol of
PhMgBr

(A)
$$\frac{1 \text{ mol of}}{PhMgBr}$$

(B) $\frac{1 \text{ mol of}}{PhMgBr}$

(C) $\frac{H_3O^{\oplus}}{PhMgBr}$

15.

Which of the following statements is//are correct?

A. First mole of $G.\ R$ reacts at $(\ -OH)$ group and the product

$$(A)$$
 is $(A)^{\operatorname{product}(A)}$ is $(A)^{\operatorname{product}(A)}$ and phenol.

B. Second mole of $G.\ R$ reacts with keto group and the product

C. Second mole of $G.\ R$ reacts with acid chloride group and the

Answer: B



16. Which of the statements is/are correct?

 $\beta - hydr \otimes y$ ester.

A. In Reformatsky reaction, lpha-bromo ester reacts with aldehyde or ketone in the presence of Mg to give

B. In Reformatsky reaction, lpha-bromo ester reacts with aldehyde or ketone in the presence of Zn to give

C. Citric acid is prepared by the reaction of $\alpha-bromoethyl$ acetate and ethyl oxaloacetate in the presence of Zn followed by hydrolysis.

D. Citric acid is prepared by the fermentation of molasses in the presence of Aspergillus wentienzymes.

Answer: B::C::D



 $\beta - hydr \otimes y$ ester.

Exercises (Single Correct)

1. 1-Ethyl-2-methyl oxirane when treated with C_2H_5MgBr , followed

by hydrolysis gives:

Answer: A



2. When ethane nitrile is treated with C_2H_5MgBr , followed by hydrolysis, the product is :

Answer: D



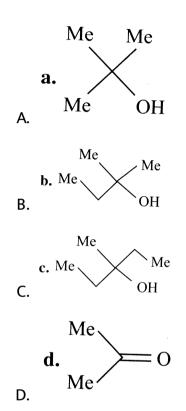
3. When methyl orthoformate is treated with followed by hydrolysis, the product is :

Answer: C

В.



4. When ethyl ethanoate is treated with excess of MeMgBr, followed by hydrolysis, the product is :



Answer: A



5. When di-isopropyl cadmium is treated with ethanoyl chloride, the product is :

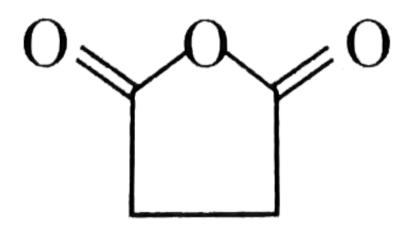
В.

C.

D.

Answer: B





6. When is

treated with C_2H_5MgBr , followed by hydrolysis, the product is :



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7. When ethanamide is treated with EtMgBr, followed by hydrolysis, the product is :

Answer: B



| 8. Propane is not formed when C_3H_7MgBr is treated with |
|---|
| A. H_2 |
| B. Phenol |
| C. Ethanoic acid |
| D. 2-Butyne |
| Answer: D |
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| |
| 9. Alcohol is not formed when $RMgX$ is treated with |
| A. Ethanoyl chloride |
| B. O_2 |

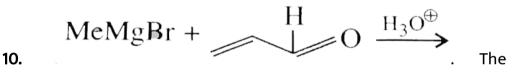
C. Oxirane

D. Methyl orthoformate

Answer: D



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product is:

D. None is correct

Answer: C



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11. The end product (C) of the following sequence of reaction is :

$$CH \equiv CH + MeMgBr(1mol)
ightarrow (A) rac{{{(i)\, CO_2}}}{{(ii)\, H_3O^\oplus}} \left(B
ight) rac{{HgSO_4\,/\, H_2SO_4}}{} \left(C
ight)$$

.

Answer: A

A) + MeMgBr
$$\xrightarrow{H_3O^+}$$
 Me \nearrow OH

12. . Hence,

$$CH \equiv CH \xrightarrow{(i)\, 1 molof\,(\,NaNH_2\,+\,liq\,.\,NH_3\,)} (C).$$
 The product (C) is :

A.
$$H = \bigcirc$$
OH

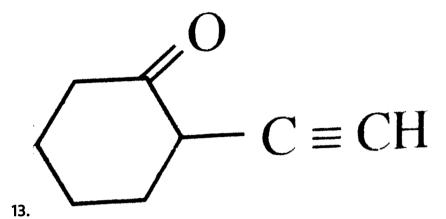
$$\mathbf{b.} \ \mathbf{H} - \equiv \mathbf{OH}$$

c.
$$H - \equiv$$

$$\mathbf{d.}\,\mathbf{H-}\equiv \overset{O}{=}\overset{O}{=}_{\mathrm{OH}}$$

Answer: A





 $\stackrel{|\mathit{HgSO}_4/\mathit{H}_2SO_4}{\longrightarrow}(A)\stackrel{2molofMeMgBr/\mathit{H}_3O^{\oplus}}{\longrightarrow}(B).(B)$ is :

A.

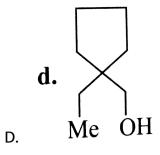
В.



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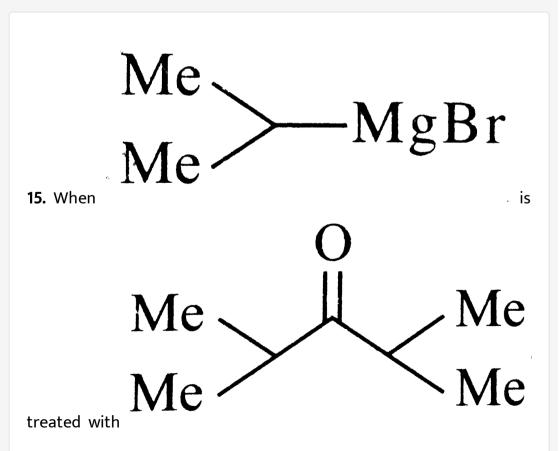
$$MeMgBr + \bigcup_{O} \xrightarrow{H_3O^{\oplus}} (A) \xrightarrow{HBr} (B) \xrightarrow{Mg/ether}$$

14.



Answer: A





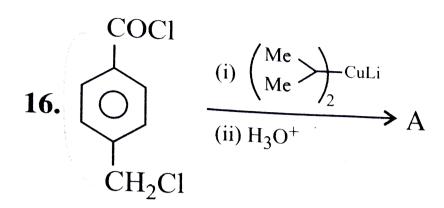
followed by hydrolysis, the product is :

B.
$$Me$$
 OH Me Me

D. None of these

Answer: B



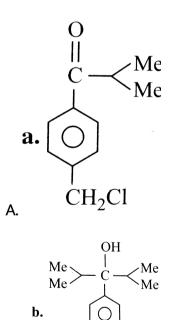


The

product A is :

В.

16.



CH₂Cl

D.

Answer: C



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$$B \leftarrow \underbrace{C_2 H_5 M g B I / H_3 U}_{(2 \text{ mol})} N = \underbrace{C}_{(2 \text{ mol})} \underbrace{A}_{(A) \text{ and}} A$$

$$(A) \text{ and}$$

(B) are:

A.
$$A$$
 and $B\Rightarrow N\equiv ext{O}$

$$C \xrightarrow{OH} Me$$

B.
$$A$$
 and $B \Rightarrow N \equiv$

$$\mathbf{d.} \ \mathbf{A} \Rightarrow \mathbf{N} \equiv \mathbf{C}$$
 \mathbf{Mc}

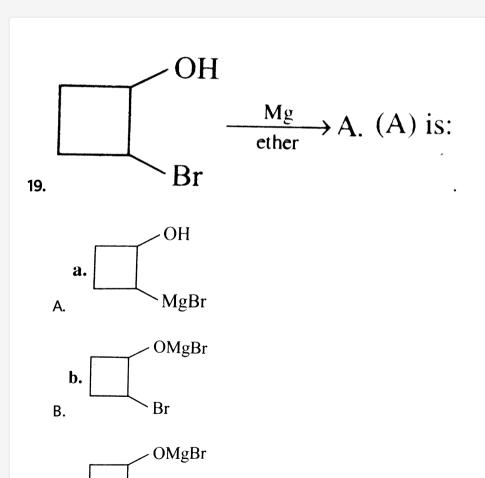
Answer: D



18.

Answer: D



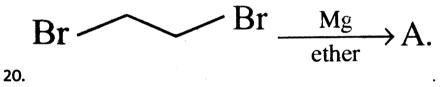


OMgBr d. MgBr D.

Answer: C



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A. a. BrMg

B. b. BrMg

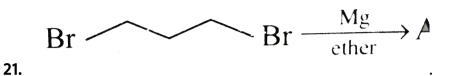
 $\mathsf{C.}\ CH_2 = CH_2$

D. All

Answer: C

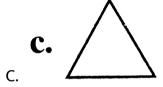


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A a. BrMg MgBi

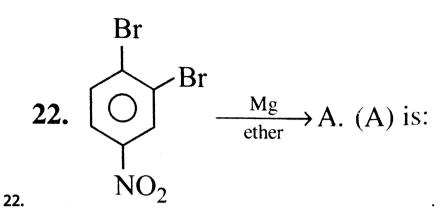
b. BrMg Br

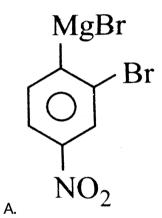


D. All

Answer: C







$$\mathbf{b.} \underbrace{\bigcirc^{\mathbf{MgBr}}_{\mathbf{MgBr}}}_{\mathbf{NO}_2} \mathbf{MgBr}$$

В.

$$\mathbf{c.} \overset{\mathrm{Br}}{\bigodot} \mathrm{MgBr}$$

D. None of these

Answer: D



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23. Ethylmercaptan is prepared by the reaction of the following, followed by hydrolysis:

A. $C_2H_5MgBr+SO_2$

B. $C_2H_5MgBr+S$

C. $C_2H_5MgBr+CS_2$

D. $C_2H_5MgBr+H_2S$.

Answer: B



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24. Methyl oxirane on reaction with CH_3MgBr , followed by hydrolysis, gives alcohol. By which of the following mechanisms does the reaction proceed ?

- A. SN^1
- ${\rm B.}\,SN^2$
- $\mathsf{C}.\,SN^i$
- D. SE

Answer: B



25. Benzonitrile on reaction with C_2H_5MgBr , followed by hydrolysis, gives.

Answer: A



26. Acetoisonitrile on reaction with C_2H_5MgBr followed by hydrolysis, gives compound (A), which one further hydrolysis gives

(B) and (C).

(B) and (C) are:

A. $MeNH_2$ and EtCHO

B. $EtNH_2$ and MeCHO

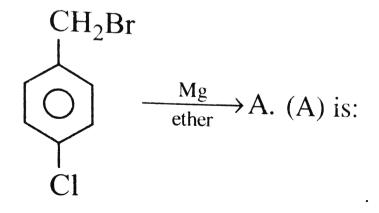
C. $MeNH_2$ and EtCOOH

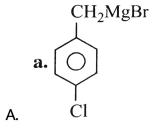
D. $EtNH_2$ and MeCOOH

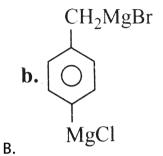
Answer: A

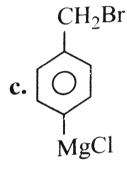
27.











D. None of these

Answer: A

C.



28. Propane dithioic acid is prepared by the reaction of the following, followed hy hydrolysis:

A.
$$C_3H_7MgBr+CS_2$$

B.
$$C_2H_5MgBr+CS_2$$

C.
$$C_3H_7MgBr+SO_2$$

D.
$$C_2H_5MgBr+SO_2$$

Answer: B



29. Propylsulphinic acid is prepared by the reaction of the following, followed by hydrolysis:

A.
$$C_3H_7MgBr+SO_2$$

B.
$$C_2H_5MgBr+SO_2$$

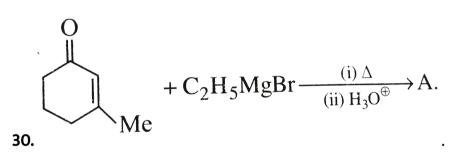
C. $C_3H_7MgBr+SO_3$

 $\mathsf{D.}\, C_2 H_5 MgBr + SO_3.$

Answer: A



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В.

D. 📝

Answer: C



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31. Ethanoic propanoic anhydride on reaction with excess of MeMgBr gives the major product.

Answer: A



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32. Reactivity of MeMgBr with the following in the decreasing order is :

A.
$$(i)>(ii)>(iii)>(iv)$$

$$\mathtt{B.}\,(iv) > (i) > (ii) > (iii)$$

$$\mathsf{C.}\left(i\right)>\left(iii\right)>\left(ii\right)>\left(iv\right)$$

$$\mathtt{D.}\,(iv) > (ii) > (iii) > (i)$$



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Product.

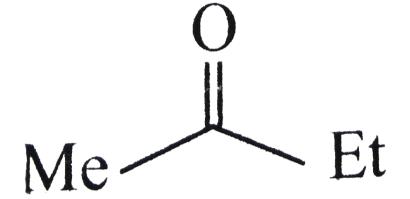
The major product is:

A.
$$H_5C_2$$
 COOH Me

C. HO
$$C_2$$
 C_3 C_4 C_5 C_5 C_5 C_5 C_6 C_6

Answer: C

34. Reactivity of



with the

following $G.\ R$ in the decreasing order is :

- (i) MeMgBr
- (ii) EtMgBr
- (iii) $Me_2CH-MgBr$
- (iv) $Me_3C-MgBr$.

A.
$$(i)>(ii)>(iii)>(iv)$$

$${\sf B.}\,(iv) > (iii) > (ii) > (i)$$

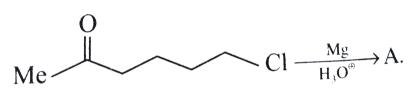
$$\mathsf{C}.\,(i) > (ii) > (iv) > (iii)$$

$$\mathsf{D}.\left(iv\right)>\left(ii\right)>\left(iii\right)>\left(i\right)$$

Answer: A



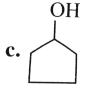
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35.

A. a. Me MgC

b. Me OH



Answer: B



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36. Reactivity of EtMgBr with the following in the decreasing order is :

- (i) HCHO
- (ii) MeCHO
- (iii) MeCOMe
- (iv) $Cl_3C CHO$.
 - A. (i)>(ii)>(iii)>(iv)
 - $\mathtt{B.}\,(iv) > (iii) > (ii) > (i)$
 - $\mathsf{C.}\left(iv\right)>\left(i\right)>\left(ii\right)>\left(iii\right)$

$$\mathsf{D}.\,(iii) > (ii)(i) > (iv)$$

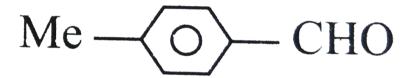
Answer: C



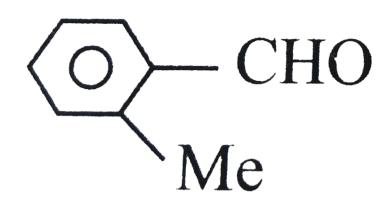
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37. Reactivity of PhMgBr with the following in the decreasing order is :

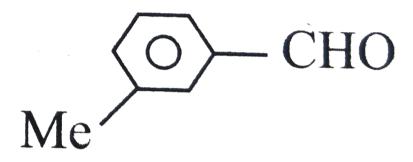
(i) PhCHO



(ii)



(iii)



(iv)

A.
$$(i)>(iv)>(ii)>(iii)$$

$$\mathrm{B.}\left(iii\right)>\left(ii\right)>\left(iv\right)>\left(i\right)$$

$$\mathsf{C}.\left(i\right)>\left(iii\right)>\left(iv\right)$$

$$\mathsf{D}.\left(i
ight)>\left(ii
ight)>\left(iii
ight)>\left(iv
ight)$$

Answer: A



38. Reactivity of PrMgBr with the following in the decreasing order is :

- (i) Alcohol
- (ii) Aldehyde
- (iii) Ketone
- (iv) Ester.

A.
$$(iv)>(iii)>(ii)>(i)$$

$$\mathsf{B.}\left(i\right)>\left(ii\right)>\left(iii\right)>\left(iv\right)$$

$$\mathsf{C.}\,(ii) > (iii) > (i) > (iv)$$

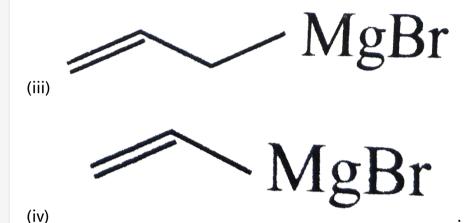
Answer: B



39. Reactivity of HCHO with the following G.R in the decreasing

order is:

- (i) PhMgBr
- (ii) $PhCH_2MgBr$



A. (iv) > (iii) > (ii) > (i)

B.(i) > (ii) > (iii) > (iv)

 $\mathsf{C.}\,(iii) > (ii) > (i) > (iv)$

D. (ii) > (iii) > (i) > (iv)

Answer: D

40. Which of the following 3° alcohols does propyl ester give during reaction with EtMgBr ?

Answer: A



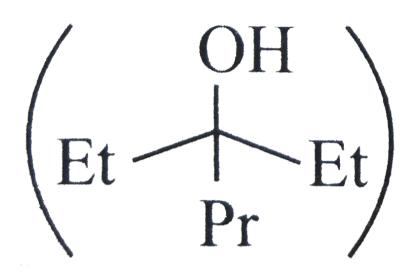
41. Ethyl ester reacts with PrMgBr to give 2° alcohol. The alcohol

is:

Answer: B



42. Methyl ester reacts with EtMgBr to give 3° alcohol



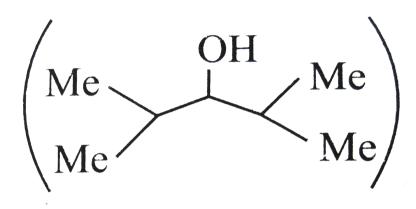
The ester is:

- A. Methyl propanoate
- B. Methyl butanoate
- C. Methyl ethanoate
- D. Methyl formate

Answer: B



43. Propyl ester reacts with isopropyl magnesium bromide to give



 2° alcohol

The ester is:

- A. Propyl methanoate
- B. Isopropyl formate
- C. Propyl ethanoate
- D. Isopropyl ethanoate

Answer: A



44. Propyl lithium reacts with ethene to give a compound (A), which on reaction with methanal followed by acidic hydrolysis gives compound (B). The compound (B) is :

A.
$$Hep \tan - 1 - ol$$

B.
$$Hep \tan - 2 - ol$$

C.
$$Hexan - 1 - ol$$

D.
$$Hexan-2-ol$$

Answer: C



45. Coupling reaction between RMgX and $R\,{}^{\prime}X$ takes place to give

R-R' in the presence of which of the following reagents ?

A. R'-OTs

- B. $CoCl_2$
- C. $MnCl_2$
- D. All

Answer: D



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46. Phenyl isocyanide + Benzyl magnesium bromide $\xrightarrow{1.Ether\,\Delta} (A)$

The compound (A) is :

C. c.
$$Ph \sim N = CH - Ph$$

D. d.
$$Ph-N=CH$$

Answer: D



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47. The compound (A) in the previous question is further hydrolysed in dilute acidic medium to give compounds (B) and (C). The compounds (B) and (C) are :

A.
$$PhNH_2$$
 and $PhCH=O$

B.
$$PhCH_2NH_2$$
 and $PhCH=O$

C.
$$PhNH_2$$
 and $PhCH_2CH=O$

$$\operatorname{\mathsf{D}}.\operatorname{\mathit{PhCH}}_2\operatorname{\mathit{NH}}_2\operatorname{\mathsf{and}}\operatorname{\mathit{PhCH}}_2\operatorname{\mathit{CH}}=\operatorname{\mathit{O}}.$$

Answer: C



Exercises Archives (Single Correct)

1. $Me_3C - MgCl$ on reaction with D_2O produces :

A. Me_3CD

B. Me_3COD

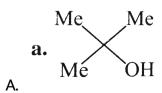
 $\mathsf{C}.\,(CD)_3CD$

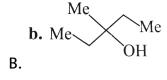
D. $(CD)_3COD$.

Answer: A



2. Ethyl ester $\xrightarrow{MeMgBr} P$. The product P will be :

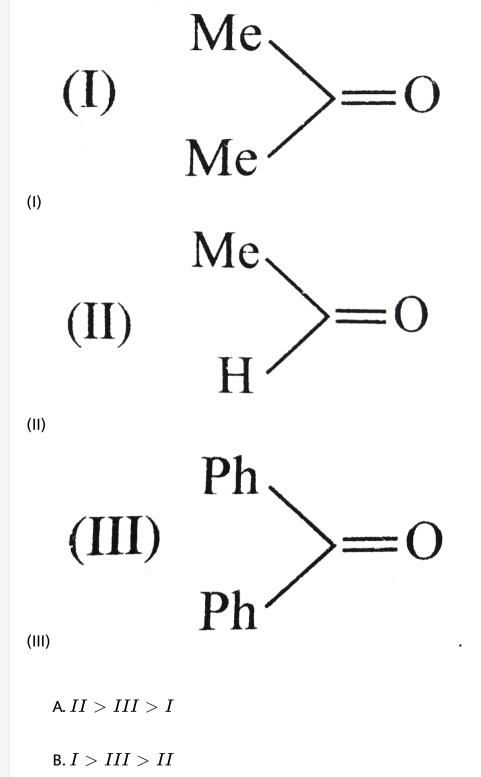




Answer: A



3. The order of reactivity of phenyl magnesium bromide with the following compounds is :



$$\mathsf{C}.\,II > I > III$$

D. All react with the same rate

Answer: C



- **4.** When phenyl magnesium bormide reacts with t-bu an ol the product would be:
 - A. Benzene
 - B. Phenol
 - C. t-Butyl benzene
 - D. t-Butyl pheyl ether

Answer: A



Exercises Archives (True/False)

1. The reaction of methyl magnesium iodide with acetone followed by hydrolysis gives secondary butanol.



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Exercises Archives (Subjective)

1. Write the structural formula of the main organic product formed when ethyl acetate is treated with double the molar quantity of MeMgBr and the reaction mixture is poured into H_2O .



2. Compound X (molecular formula C_5H_8O) does not react appreciably with Lucas reagent at room temperature but gives a precipitate with amononiacal silver nitrate with excess of MeMgBr, 0.42gm of X gives 224ml of CH_4 at $S.\ T.\ P$ Treatment of X with H_2 . in the presence of Pt catalyst followed by boiling with excess of HI, gives n-pentane. Suggest the structure for X and write the equations involved.



3. Identify the major products in the following reaction.

 $C_6H_5COOH + MeMgI \rightarrow ? + ?.$



4. In the following reactions, identify the compounds A,B,C and D

- (i) $PCl_5 + SO_2 \rightarrow A + B$
- (ii) $A + MeCOOH \rightarrow C + SO_2 + HCl$
- (iii) $2C + Me_2Cd
 ightarrow 2D + CdCl_2.$
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5. 1,4-Pentadiene reacts with excess of HCl in the presence of benzoyl peroxide to give compound X, which upon reaction with excess of Mg in dry ether forms Y. Compound Y on treatment with ethyl acelate followed by treatment with dilute acid yields Z. Identify the structure of componds. X, Y and Z.



6. A hydrocarbon A of the molecular formula C_8H_{10} . On ozonolysis gives only the compound $B(C_4H_6O_2)$. The compound B can also be obtained from the alkyl bromide $C(C_3H_5Br)$ upon treatment with Mg in dry ether followed by the addition of CO_2 and acidification. Identify A,B and C and also give equations for the reactions.



7. An ester $A(C_4H_8O_2)$, on treatement with excess of methyl magnesium bormide followed by acidification, gives an alcohol B as the sole organic product. Alcohol B on oxidation with NaOCl followed by acidification gives acetice acid. Deduce the structures of A and B. Show the reactions involved.

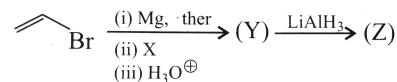


8. Cyclobutyl bromide on treatment with magnesium in dry ether forms an organometallic compound (A). The organometallic compound (A) reacts with ethanol to give an alcohol (B) after mild acidification. Prolonged treatment of alcohol (B) with an equivalent amount of HBr gives 1-bromo-1-methylcyclopentane (C) Write the structures of (A) and (B), and explain how (C) is obtained from (B).



9. Identify Z+Y in the following synthetic scheme and write their structures. Explain the formation of labelled formaldehyde (H_2C^*O) as one of the products when compound (Z) is treated with HBr and subsequently ozonolysed. Take C^* as carbon in the entire scheme.

$$BaC^*O_3 + H_2SO_4
ightarrow Xig(C^* = C^{14}ig)$$





Exercises Archives (Linked Comprehension)

1. In the following reaction sequence, products I, J, and L are formed.

K represents a reagent.

Hex-3-ynal
$$\xrightarrow{\text{(i) NaBH}_4}$$
 I $\xrightarrow{\text{(ii) Mg/ether}}$ J $\xrightarrow{\text{K}}$ L $\xrightarrow{\text{(ii) PBr}_3}$ I $\xrightarrow{\text{(ii) Mg/ether}}$ J $\xrightarrow{\text{K}}$ Method L $\xrightarrow{\text{Pd/BaSO}_4, \text{ quinoline}}$ $\xrightarrow{\text{Cl}}$ \Longrightarrow $\xrightarrow{\text{O}}$

The structures of product I is :

c. Me Br d. $\stackrel{\text{Me}}{=}$

The structures of compounds J and K, respectively, are :

a. Me
$$\longrightarrow$$
 COOH and SOCl₂
b. M \longrightarrow OH and SO₂Cl₂

Me \longrightarrow O

d. Me and CH_3SO_2Cl

The structure of product L is :

