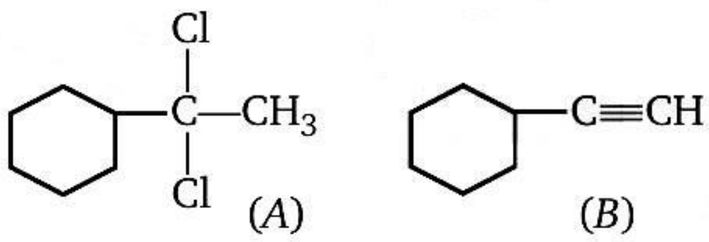
4C Hydrocarbons (Alkynes)

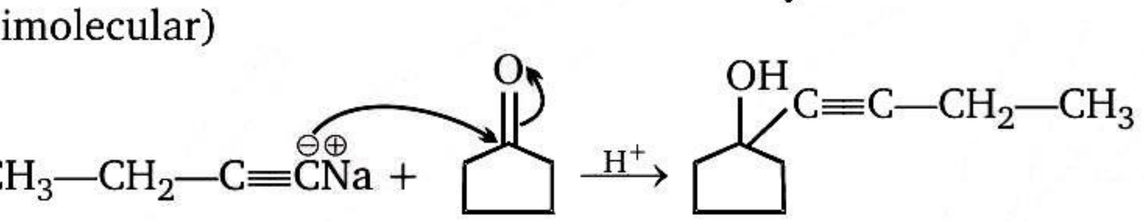
Level - 1

1. (b)

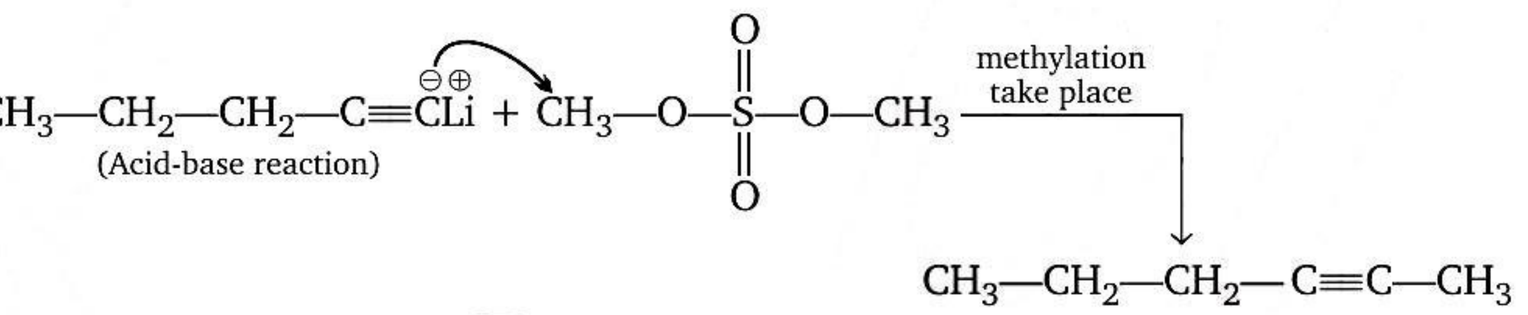


2. (b) Formation of vicinal di-halide followed by two consecutive E_2 reaction. (elimination bimolecular)

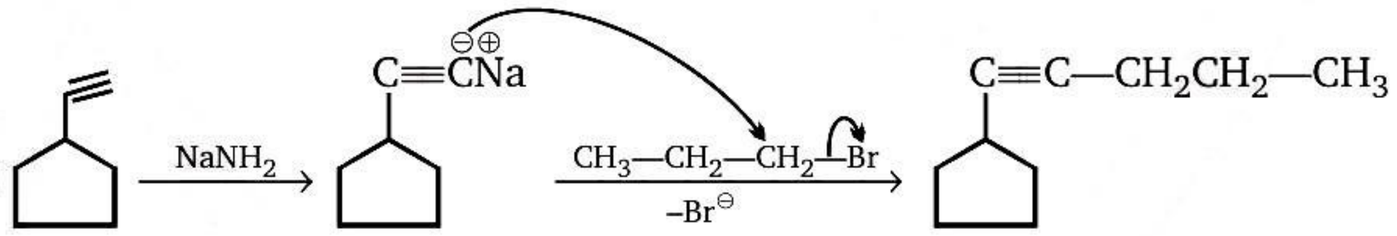
3. (b)



4. (b)



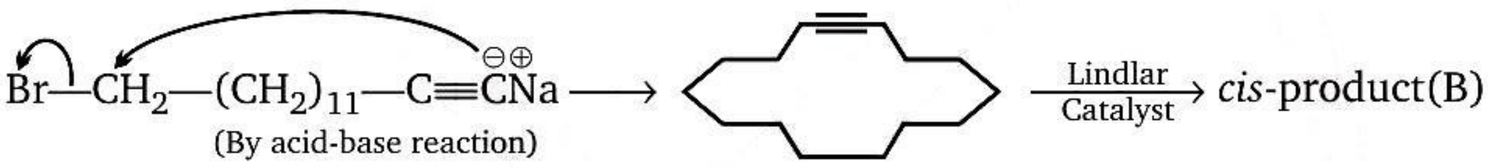
5. (b)



6. (d) All alkyne on catalytic hydrogenation give 3-ethylhexane.

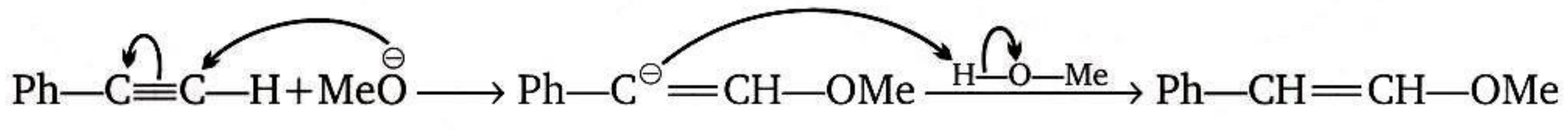
7. (c) Reagent (I) give *trans* product. Reagent (II) and (III) give *cis*-product.

8. (c)



9. (b) $Ph - C \equiv C - H + MeO^{\ominus} \rightleftharpoons Ph - C \equiv C^{\ominus} + MeOH$ (St.acid)

equilibrium is backward. $\therefore$ $MeO^{\ominus}$ will attack as a nucleophile



10. (d) $Ph-\underset{\underset{Cl}{|}}{\overset{\overset{Cl}{|}}{C}}-CH_3 \xrightarrow{2NaNH_2} Ph-C=CH \xrightarrow{NaNH_2} \underset{(A)}{Ph-C\equiv C^{\ominus}Na^{\oplus}}$

11. (b) $H-\underset{\underset{Et}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-CH_2-CH_2-Br \xrightarrow[-Br^{\ominus}]{\overset{\oplus}{Na}\overset{\ominus}{C}\equiv C} H-\underset{\underset{Et}{|}}{\overset{\overset{CH_3}{|}}{C}}-(CH_2)_3-C\equiv CH$

12. (d) Reaction proceed through enol format on and H_2O attack on stable carbocation in this reaction.

$\therefore$ (d) is most favourable. (Kucherov reaction)

13. (c) Acid-base reaction follower by S_{N^2}

$\therefore$ I is better leaving group than Br.

$\therefore$ (c) is favourable.

14. (c) $Ph-C\equiv C-H \longrightarrow Ph-C\equiv \overset{\ominus}{C} + I-I \longrightarrow Ph-C\equiv C-I$

(base)

15. (c) $C\equiv C-H \xrightarrow{\overset{\oplus}{Na}\overset{\ominus}{N}H_2} C\equiv C^{\ominus}Na^{\oplus} \xrightarrow{CH_3-Br} C\equiv C-CH_3 \xrightarrow{H_2/Pd/BaSO_4}$ cis

16. (a) $\xrightarrow{2H_2/Pt}$ optically inactive.

17. (c) $H-C\equiv CH + \xrightarrow[\Delta]{}$

(Cu-tube) (Polymerization reaction)

18. (a) (*A*) $Et-C\equiv C-Et$ (*B*) $\underset{H}{\overset{Et}{}}C=C\underset{Et}{\overset{H}{}}$ (*C*) $Et-\underset{\underset{Br}{|}}{CH}-\underset{\underset{Br}{|}}{CH}-Et$

19. (a) (*X*) $-CH=CH-C\equiv CH$

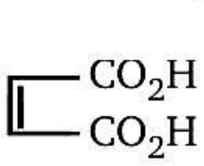
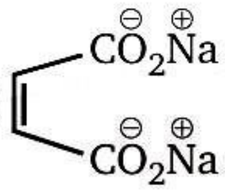
gives all the given products in different reaction.

20. (c) $CH_3—CH_2—OH \xrightarrow{HBr} CH_3—CH_2—Br \xrightarrow{\overset{\oplus}{Na}\overset{\ominus}{C}\equiv CH} CH_3—CH_2—C\equiv CH \xrightarrow[\text{lindlar catalysis}]{H_2/Pd}$ 1-butene

21. (b) Symmetrical alkyne will give acid only. (*i.e.*, 4-octyne)

22. (c) Degree of unsaturation (or) Double bond equivalent $= (C + 1) - \left(\frac{H + X - N}{2}\right)$

D.B.E. = 7

23. (c) (*A*)  (*B*)  (*C*) $HC \equiv CH$

24. (c) None of the given reagent.

25. (a) (*A*) $H—C\equiv C—CH_2—CH_3$ (Terminal alkyne gives white ppt. with ammonical $AgNO_3$)

26. (c) $CH_3—\underset{Br}{CH}—\underset{Br}{CH_2} \xrightarrow{2NaNH_2} CH_3—C\equiv C—H \xrightarrow{\overset{\oplus}{Na}\overset{\ominus}{NH_2}} CH_3—C\equiv C^{\ominus\oplus}Na + CH_3—CH_2—Br$

$CH_3—C\equiv C—CH_2—CH_3$

Total 3 moles of $NaNH_2$ are required.

27. (c) $CH_3—\underset{CH_3}{CH}—C\equiv CH \xrightarrow{H^+Br^-} CH_3—\underset{CH_3}{CH}—\underset{Br}{C}=CH_2 \xrightarrow{H^+Br^-} CH_3—\underset{CH_3}{CH}—\underset{Br}{\underset{|}{C}}—CH_3$

28. (b) $CH_3—C\equiv C—CH_3 \xrightarrow{\text{Cold } KMnO_4} CH_3—\overset{O}{\overset{\|}{C}}—\overset{O}{\overset{\|}{C}}—CH_3$

29. (d)

30. (c)

$H—C\equiv C—H \xrightarrow{\text{(1) Excess } NaNH_2} \overset{\oplus}{Na}\overset{\ominus}{C}\equiv\overset{\ominus}{C}\overset{\oplus}{Na} \xrightarrow{\text{Excess}}$ 5-Decyne

$I—CH_2—CH_2—CH_2—CH_3$

$I—CH_2—CH_2—CH_2—CH_3$

$CH_3—CH_2—CH_2—CH_2—C\equiv C—CH_2—CH_2—CH_2—CH_3$