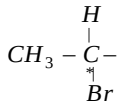
Structural and stereo isomerism

121. (b) Structure have 3-different atoms and group so it is unable to show geometrical isomerism

122. (c) Metamerism is shown by the different arrangement of alkyl group about functional group.

123 (a) A meso compound

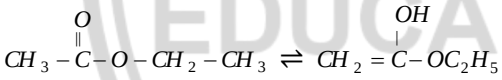
124. (b)  , it is a chiral compound.

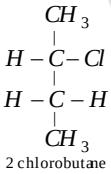
125. (a) Diethyl ketone and methyl propyl ketone are position isomers

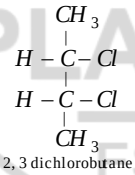
126. (c) CH_3-O-CH_3 and C_2H_5OH are functional isomers.

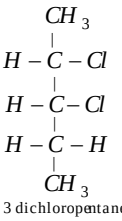
127. (c) Both are enantiomer.

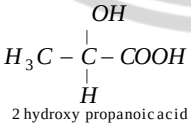
128. (d) $CH_3COOC_2H_5$ shows tautomeric isomerism.



129. (b) 
2 chlorobutane

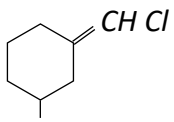

2, 3 dichlorobutane


2, 3 dichloropentane


2 hydroxy propanoic acid

130. (d) Gaseous density of both ethanol and dimethyl ether would be same under identical condition of temperature and pressure while the rest of these three properties vapour pressure, boiling point and heat of vaporization will differ as ethanol has hydrogen bonding where as ether does not.

131. (d)



132. (a) $\underset{H}{\overset{CH_3}{>}}C=C\underset{H}{\overset{CH_3}{<}}$ $\underset{H}{\overset{CH_3}{>}}C=C\underset{CH_3}{\overset{H}{<}}$

cis 2 butene Trans 2 butene

Cis-trans isomerism shown by compound which have double or triple bond by which they restrict their rotation, since 2 butyne have no hydrogen on triple bonded carbon.

$\underset{\text{2 butyne}}{CH_3-C\equiv C-CH_3}$ [It does not show cis-trans]

133. (d) Because it contain asymmetric carbon atom.

$$CH_3-CH_2-\underset{\displaystyle CH_3}{\overset{\displaystyle |}{\underset{\displaystyle |}{CH}}}-COOH$$

134. (a) *R*

135. (b) $HC\equiv C-\underset{\displaystyle Cl}{\overset{\displaystyle H}{\overset{\displaystyle |}{\underset{\displaystyle |}{C}}}}-CH_3$ shows optical isomerism because of molecule is unsymmetrical. That is called chiral.

136. (c) Nitroalkanes exhibit tautomerism. In it, $\alpha-H-$ atom is labile and form nitrolic acid.

$$H_3C-CH_2-N\overset{O}{\underset{O}{\swarrow\!\!\!\searrow}}\leftrightarrow H_3C-CH=N\overset{OH}{\underset{O}{\swarrow\searrow}}$$

137. (b) $H-\underset{\displaystyle OH}{\overset{\displaystyle CH_3}{\overset{\displaystyle |}{\underset{\displaystyle |}{C}}}}-COOH$ shows optical isomerism due to presence of asymmetric carbon atom.

138. (a)2-chloro butane has a chiral carbon atom, hence only it will show optical activity and will possess two enantiomers (one chiral carbon atom).

$$CH_3CH_2-\underset{\displaystyle Cl}{\overset{\displaystyle H}{\overset{\displaystyle |}{\underset{\displaystyle |}{C^{\bullet}}}}}-CH_3$$

139. (b) C_4H_7Cl is a monochloro derivative of C_4H_8 which itself exists in three isomeric forms.

(i) $CH_3-CH_2-CH=CH_2$: Its possible mono-chloro derivatives are :

$CH_3-CH_2-CH=CH-Cl$

2 isomers : cis and trans forms

$CH_3-\overset{\bullet}{C}H-CH=CH_2$ (Cl below the C)

optically active (exists in two forms)

$ClCH_2-CH_2-CH=CH_2$ (one form)

$H_3C-CH_2-\overset{Cl}{C}=CH_2$ (one form)

(ii) $CH_3-CH=CH-CH_3$: Its possible monochloro derivatives are :

$CH_3-CH=\overset{Cl}{C}-CH_3$

Exists in two geometrical forms

$CH_3-CH=CH-CH_2Cl$

Exists in two geometrical forms

(iii) $CH_3-\overset{CH_3}{C}=CH_2$: Its possible monochloro derivatives are

$CH_3-\overset{CH_3}{C}=CH-Cl$

Only one form

$ClCH_2-\overset{CH_3}{C}=CH_2$

Only one form

Thus, the total acylic isomers forms of C_4H_7Cl are 12.

140. (d) $\overset{1}{C}H_3-\overset{2}{C}H(\overset{CH_3}{})-\overset{3}{C}H_2-\overset{4}{C}H_3$

Its monochloro derivatives are as follows :

(i) $ClCH_2-\overset{\bullet}{C}H(\overset{CH_3}{})-CH_2-CH_3$

or $CH_3-\underset{\bullet}{C}H-CH_2-CH_3$ (with CH_2Cl on the C)

It will exist as enantiomeric pair (*d* and *l*-forms)

(ii) $CH_3-C(Cl)(CH_3)-CH_2-CH_3$

no asymmetric *C* atom

(iii) $CH_3-CH(CH_3)-CH(Cl)-CH_3$

It will exist as enantiomeric pair (*d*- and *l*-forms)

(iv) $CH_3-CH(CH_3)-CH_2-CH_2-Cl$

No asymmetric carbon atom

Hence, only two enantiomeric pairs will be obtained by the monochlorination of 2-methylbutane.