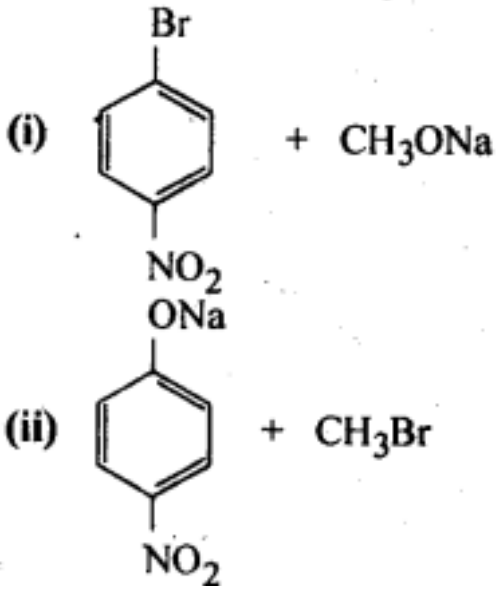
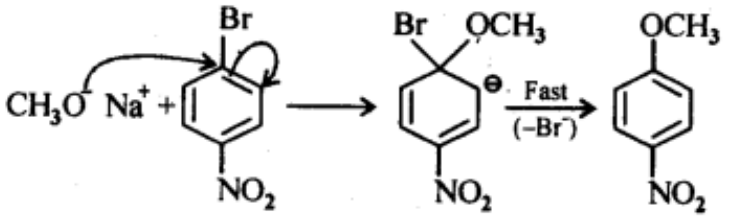
11.11. Which of the following is an appropriate set of reactants for the preparation of l-methoxy-4- nitrobenzene and why?



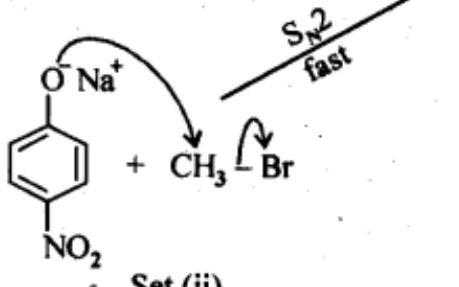

Ans:

**Chemically, both sets are equally probable.**




Set (i)

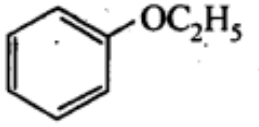
1-Methoxy-4-nitrobenzene

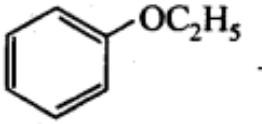



Set (ii)

11.12. Predict the products of the following reactions:

(i) $CH_3-CH_2-CH_2-O-CH_3-HBr \rightarrow$

(ii)  $+ HBr \longrightarrow$

(iii)  $+ HBr \longrightarrow$

(iv) $(CH_3)_3C-OC_2H_5 \xrightarrow{HI}$

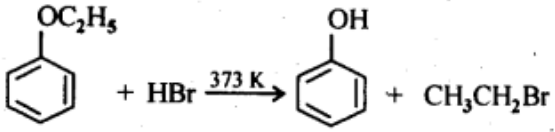
Ans:

(i) $CH_3CH_2CH_2OCH_3 + HBr \xrightarrow{373K}$

$CH_3CH_2CH_2OH$ + $CH_3Br$

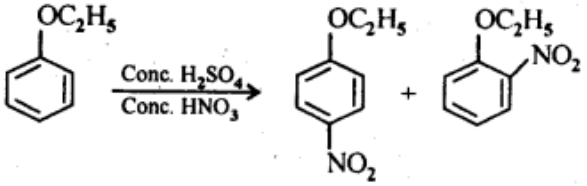
Propan-1-ol Bromomethane

(ii)



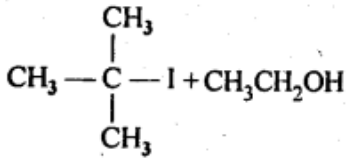
Phenol Bromoethane

(iii)



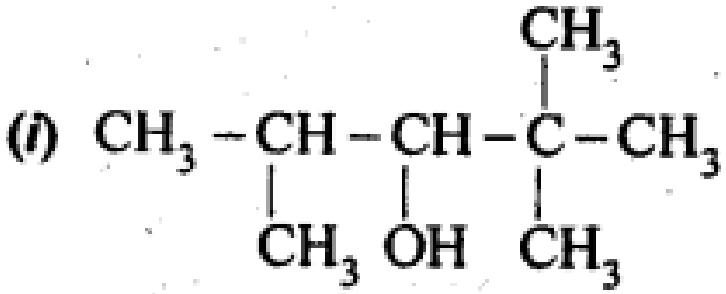
(Major) (Minor)

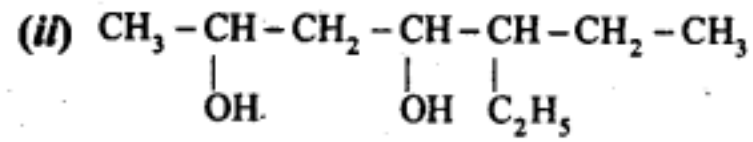
(iv) $(CH_3)_3C-OC_2H_5 + HI \longrightarrow$

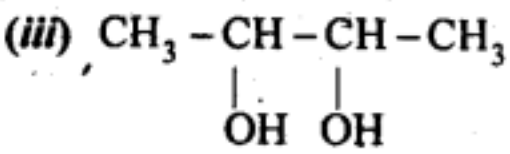


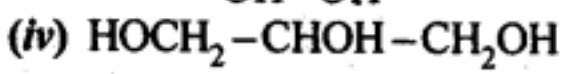
NCERT EXRECISES

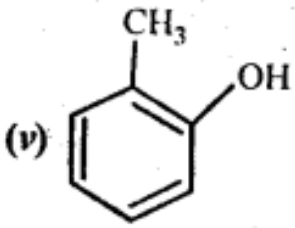
11.1. Write IUPAC names of the following compounds:

(i) 

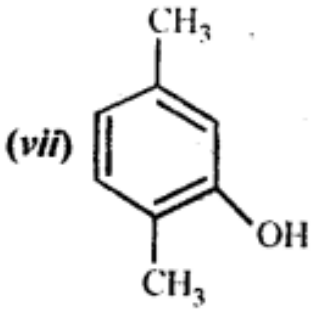
(ii) 

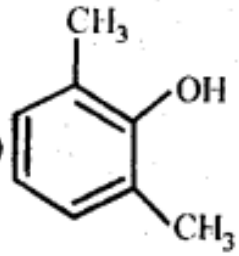
(iii) 

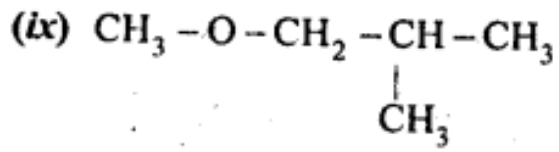
(iv) 

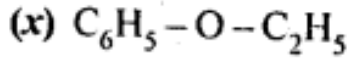
(v) 

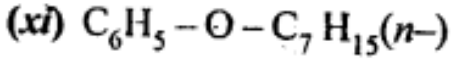
(vi) 

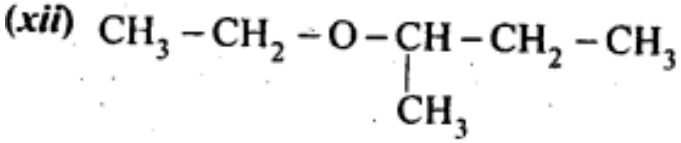
(vii) 

(viii) 

(ix) 

(x) 

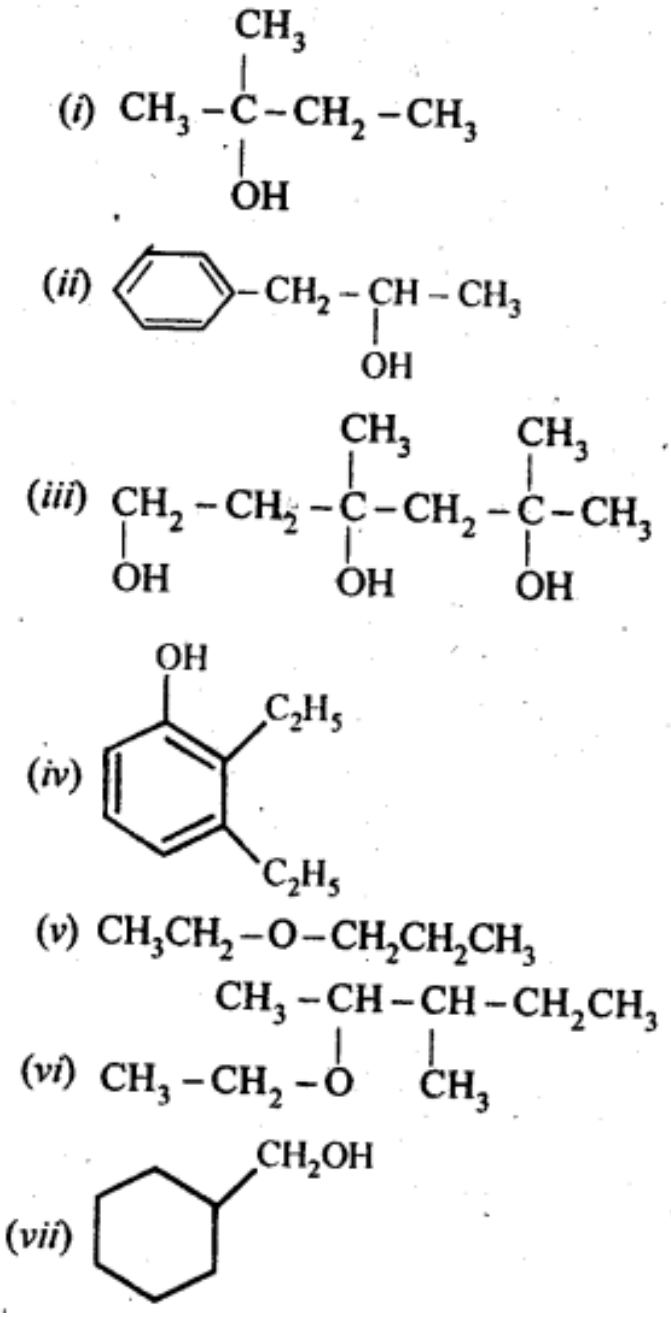
(xi) 

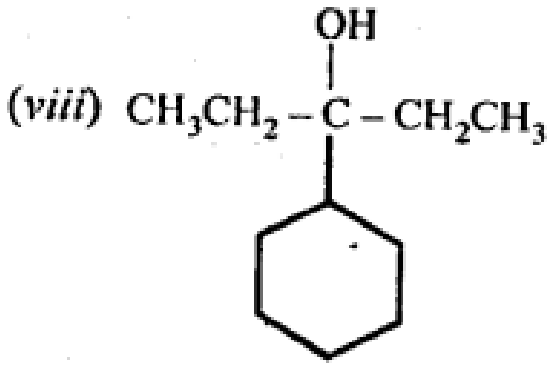
(xii) 

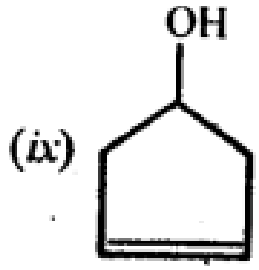
Ans:
(i) 2, 2, 4-Trimethylpentan-3-ol
(ii) 5-Ethylheptane-2, 4-diol
(iii) Butane-2, 3-diol
(iv) Propane-1, 2, 3-triol
(v) 2-Methylphenol
(vi) 4-Methylphenol
(vii) 2, 5-Dimethylphenol
(viii) 2, 6-Dimethylphenol
(ix) 1-Methoxy-2-methylpropane
(x) Ethoxybenzene
(xi) 1-Phenoxyheptane
(xii) 2-Ethoxybutane

11.2. Write structures of the compounds whose IUPAC names are as follows:
(i) 2-Methylbutan-2-ol

(ii) 1-Phcnylpropan-2-ol
(iii) 3, 5-Dimethylhexane-1, 3, 5-triol
(iv) 2, 3-Dicthylphenol
(v) 1-Ethoxypropane
(vi) 2-Ethoxy-3-methylpentane
(vii) Cyclohexylmethanol
(viii) 3-Cyclohexylpcntan-3-ol
(ix) Cyclopcnt-3-en-l-ol
(x) 4-Chloro-3-ethylbutan-l-ol
Ans:



(viii) 

(ix) 

(x) $ClCH_2-CH(C_2H_5)-CH_2-CH_2OH$

11.3. (i) Draw the structures of all isomeric alcohols of molecular formula $C_5HI_20$ and give their IUPAC names.

(ii) Classify the isomers of alcohols in question 11.3 (i) as primary, secondary and tertiary alcohols.

Ans: Eight isomers are possible. These are:

(i) $CH_3CH_2CH_2CH_2CH_2OH$

Pentan-1-ol

(1°)

(ii) $CH_3CH_2CH_2-CH(OH)CH_3$

Pentan-2-ol

(2°)

(iii) $CH_3CH_2CH(OH)-CH_2CH_3$

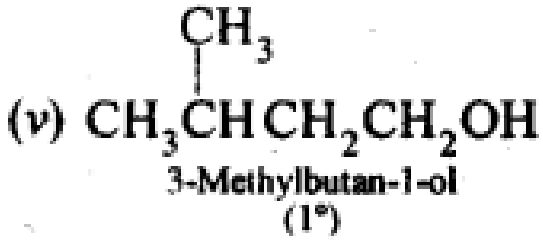
Pentan-3-ol

(2°)

(iv) $CH_3CH_2CH(CH_3)CH_2OH$

2-Methylbutan-1-ol

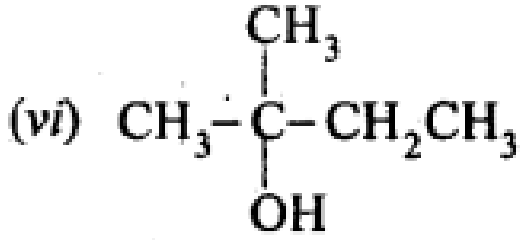
(1°)



(v) $CH_3CH(CH_3)CH_2CH_2OH$

3-Methylbutan-1-ol

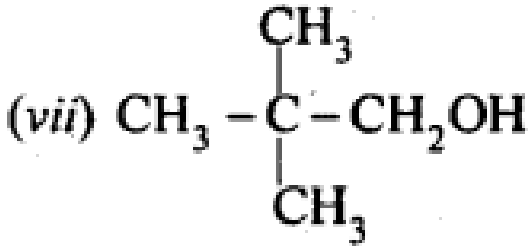
(1°)



(vi) $CH_3-C(CH_3)(OH)-CH_2CH_3$

2-Methylbutan-2-ol

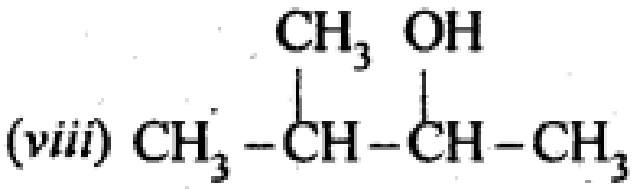
(3°)



(vii) $CH_3-C(CH_3)_2-CH_2OH$

2,2-Dimethylpropan-1-ol

(1°)



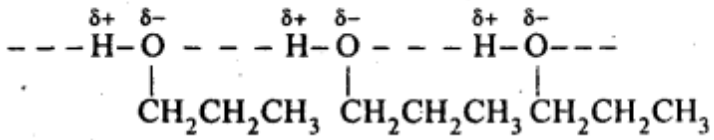
(viii) $CH_3-CH(CH_3)-CH(OH)-CH_3$

3-Methylbutan-2-ol

(2°)

11.4. Explain why propanol has higher boiling point than that of the hydrocarbon, butane?

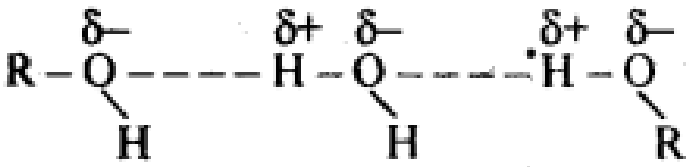
Ans: The molecules of butane are held together by weak van der Waal's forces of attraction while those of propanol are held together by stronger intermolecular hydrogen bonding.



Therefore, the boiling point of propanol is much higher than that of butane.

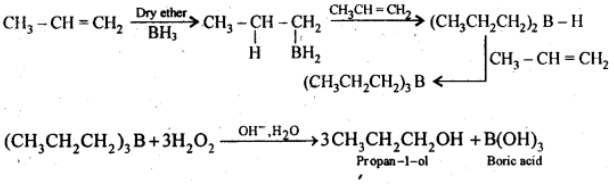
11.5. Alcohols are comparatively more soluble in water than hydrocarbons of comparable molecular masses. Explain this fact.

Ans: Alcohols can form hydrogen bonds with water and by breaking the hydrogen bonds already existing between water molecules. Therefore, they are soluble in water.



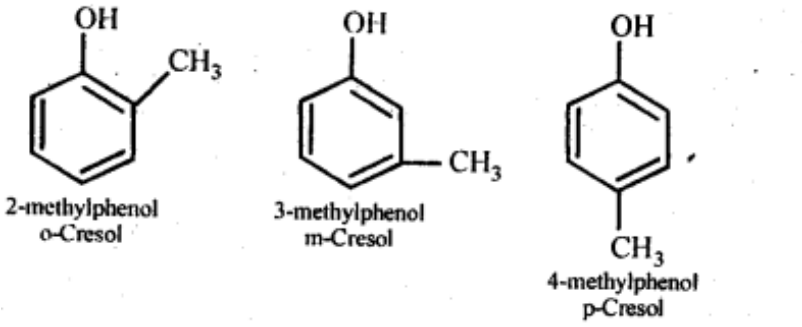
On die other hand, hydrocarbons cannot from hydrogen bonds with water and hence are insoluble in water.

11.6. What is meant by hydroboration-oxidation reaction? Illustrate it with an example.
Ans: The addition of diborane to alkenes to form trialkyl boranes followed by their oxidation with alkaline hydrogen peroxide to form alcohols is called hydroboration-oxidation. For example,

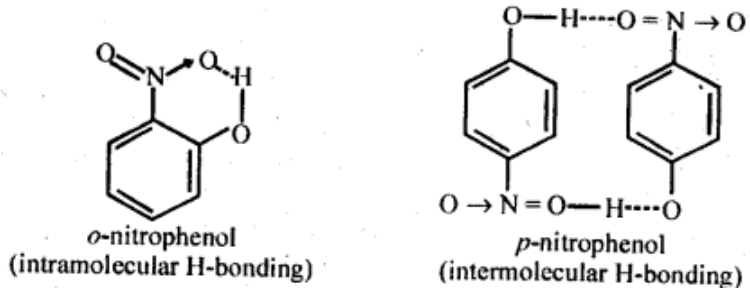


**Hydroboration oxidation amounts to anti Markonikov addition of water to the unsymmetrical alkene.**

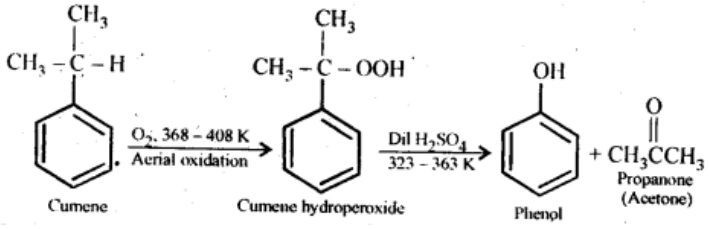
11.7. Give the structures and IUPAC names of monohydric phenols of molecular formula, $C_7H_8O$.
Ans: The three isomers are:




11.8. While separating a mixture of ortho and para nitrophenols by steam distillation, name the isomer which will be steam volatile. Give reason.
Ans: O-N itrophenol is steam volatile due to chelation (intramolecular H - bonding) and hence can be separated by steam distillation from/Miitrophenol which is hot steam volatile because of intermolecular H-bonding.

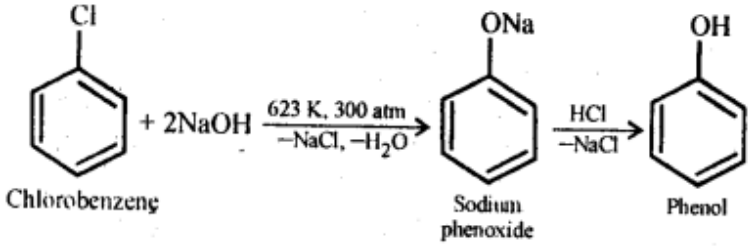



11.9. Give the equations of reactions for the preparation of phenol from cumene.
Ans:



11.10. Write chemical reaction for the preparation of phenol from chlorobenzene.

Ans:

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