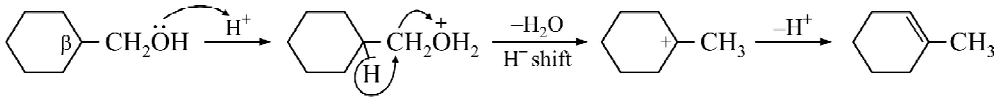
SOLUTIONS

Module - 5 / JEE-2021

In-Chapter Exercises	Chemistry	Oxygen Containing Organic Compounds - I (Alcohol)

EXERCISE - A

1. (B) H_2/Pt reduces both C = C bonds and C = O bonds while $NaBH_4$ does not reduce C = C bond. **2.(C)**

3. (B) 

If β carbon is 3°, then E1 occurs as a special case.

4. (B) Formation of most stable carbocation is the rate determining step.

5. (C) $LiAlH_4$ in ether reduces acid to alcohols most effectively.

6.(A) Due to straight chains (1° alcohols), Vander waal forces are higher. Branching (in 3° alcohols) lowers surface area and thus decreases vander waal forces.

7.(A) Except MeOH, which is more acidic than H_2O. **8. (C)** Victor-Meyer test : 3° alcohol does not respond.

9. (A) Lucas test : 3° alcohol is most reactive. **10.(C)**

11. (B) $CH_3 - \underset{\underset{Br}{|}}{CH} - CH_3 \xrightarrow[KOH]{alc.} CH_3 - CH = CH_2 \xrightarrow[peroxide]{HBr} CH_3 - CH_2 - CH_2Br \xrightarrow{CH_3ONa} n-Pr-O-CH_3$

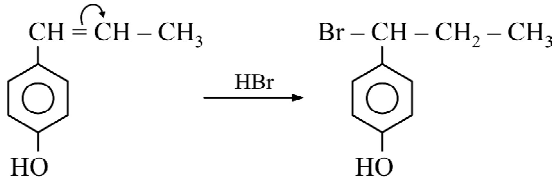
12. (D) Lucas test : 3° alcohol is most reactive. **13. (B)** $CH_3 - \underset{\underset{O}{||}}{C} - CH_2CH_2CH_3$ (Methyl Ketones give Iodoform Test)

14.(AB) **15. (A)** Reactivity towards S_N1 : 3° > 2° > 1° (HBr usually follows S_N1 path)

16. (C) $CH_3 - \underset{\underset{O}{||}}{C} - C_2H_5 \longleftarrow CH_3 - \underset{\underset{OH}{|}}{CH} - C_2H_5$

17. (C) All are 2° alcohols except IV (Benzyl alcohol). Look for the stability of carbocations using hyperconjugation.

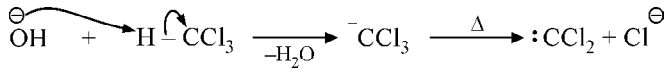
18. (C) $CH_2 = \underset{\underset{Ph}{|}}{C} - CH_2 \xrightarrow{H^+/H_2O} CH_3 - \underset{\underset{Ph}{|}}{\overset{\overset{OH}{|}}{C}} - CH_3$ (2-Phenyl propene) **19. (B)** Conc. H_3PO_4 is a dehydrating agent.

20. (B)  (Visualise more stable benzyl carbocation).

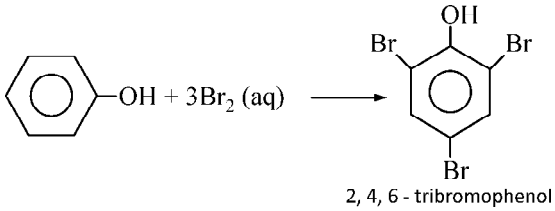
EXERCISE - B

1.(C) Methyl salicylate is produced by many species of plants particularly wintergreens. So it is a component of oil of wintergreen.

2.(D) This is the Reimer - Teimann Reaction. The electrophile is $:CCl_2$ (dichlorocarbene) generated from $CHCl_3$ by the action of a base.

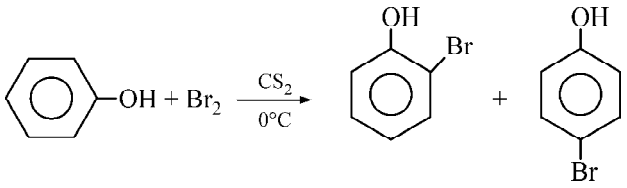


3.(D) Phenol undergoes electrophilic subtitution reactions much more readily compared to benzene due to electron releasing ability of –OH group. Also, –OH group is strongly 'o' and 'p' directing due to +M effect.

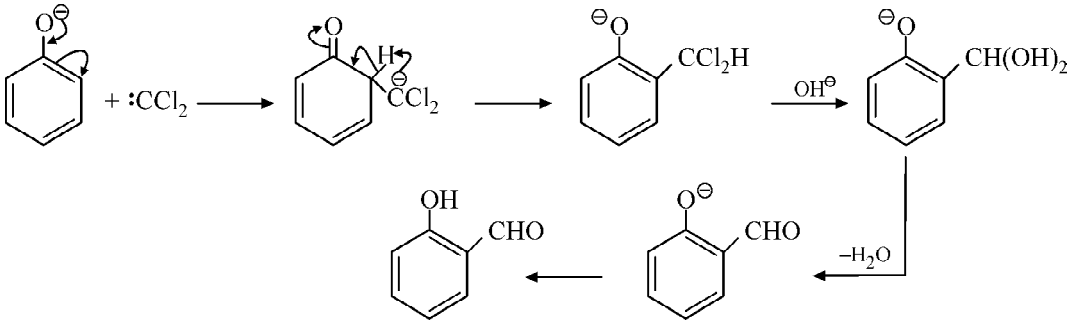


2, 4, 6 - tribromophenol

4.(B)

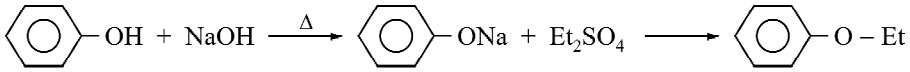


5.(AD)



6.(C) Phenol is also known as carbolic acid **7. (A)** Phenol is a weaker acid than H_2O.

8.(B)

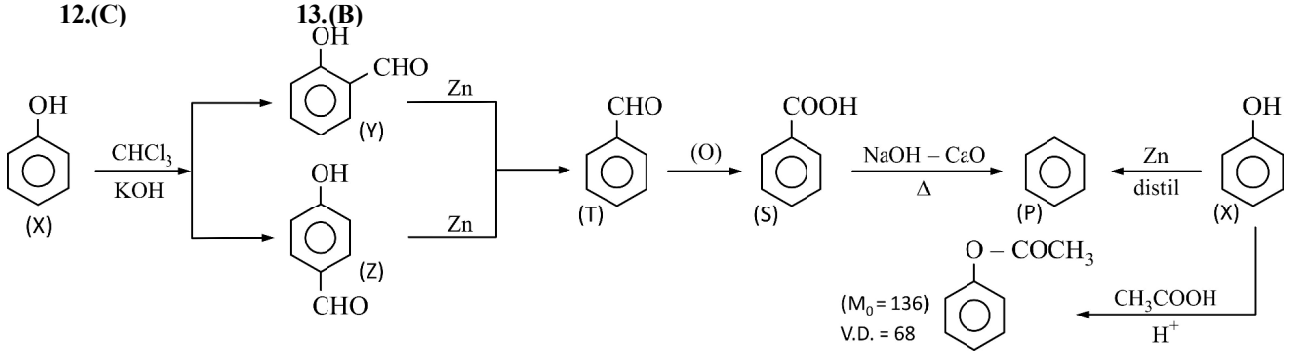


9.(AC) Phenol reacts with $FeCl_3$, whereas Benzyl alcohol does not.
Phenol does't react with Luca's reagent, whereas benzyl alcohol does.

10. (AC) $C_6H_5OH \xrightarrow[NaOH(aq.)]{CH_3COCl} C_6H_5 - O - \overset{O}{\overset{\|}{C}} - CH_3$ (Acetylation ; Schotten Baumann)

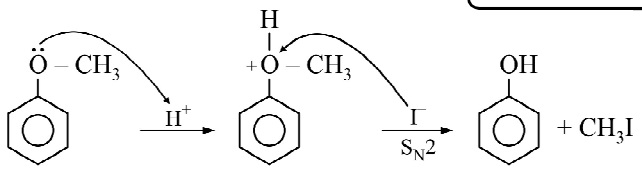
For Question 11 - 13

11.(B) **12.(C)** **13.(B)**



EXERCISE - C

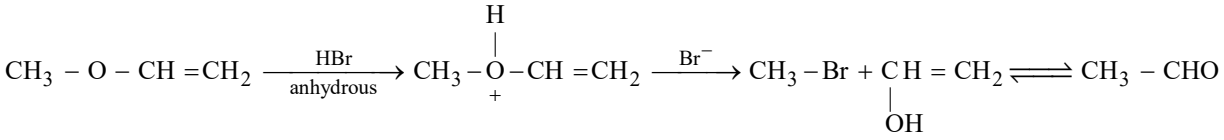
1.(B)



2.(D) Epoxides react with Grignard reagents and form 1°, 2° and 3° alcohol depending on the structure of epoxide.

3.(D) By williamson's method : Halide should be 1°, as it is S_N2. **Note:** (A) will also form ether but it is not Williamson's method.

4.(C)



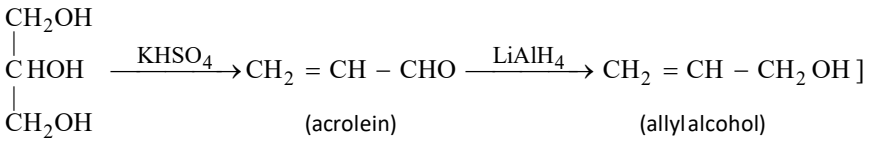
5.(D) Ether: sp^3 with 2 lone pairs **6.(A)**

7.(C) $C_2H_5 - O - C_2H_5$ hot $\xrightarrow[HI,\Delta]{conc.}$ $2C_2H_5I$

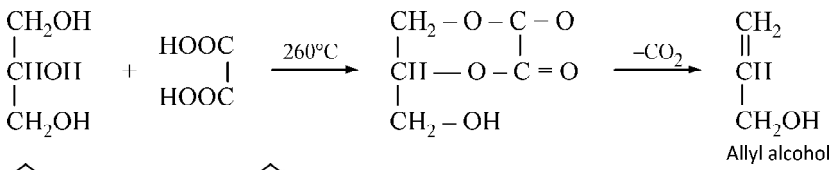
Usually, C_2H_5OH and C_2H_5I is formed. If excess of HI is used, then 2 moles of C_2H_5I is formed.

EXERCISE - D

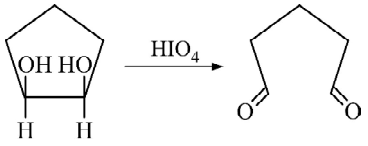
1.(A)



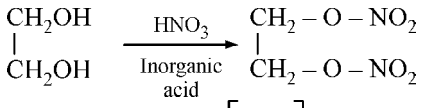
2.(B)



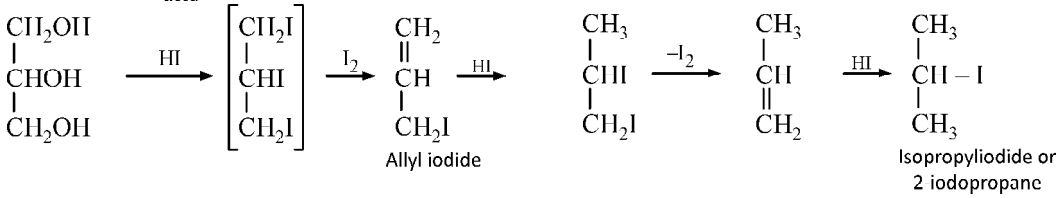
3.(A)



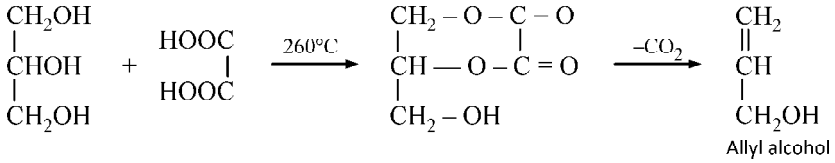
4.(C)



5.(D)



6.(B)



7.(C) Ethylene glycol is used to lower the freezing point of water in the radiator.