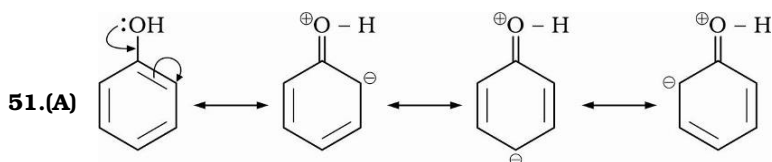
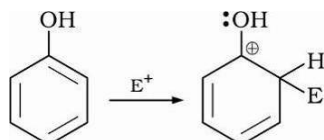


Daily Tutorial Sheet 3

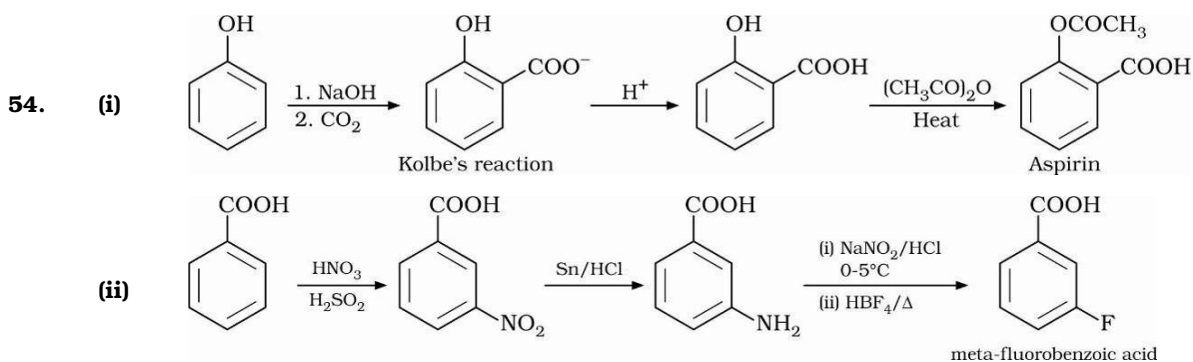
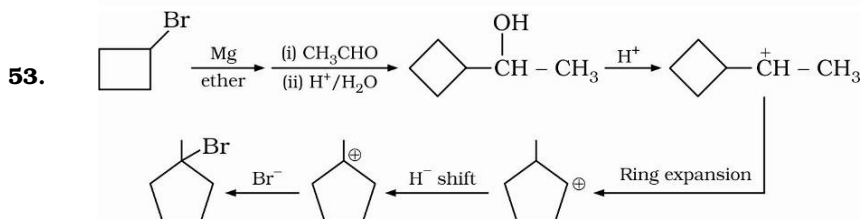
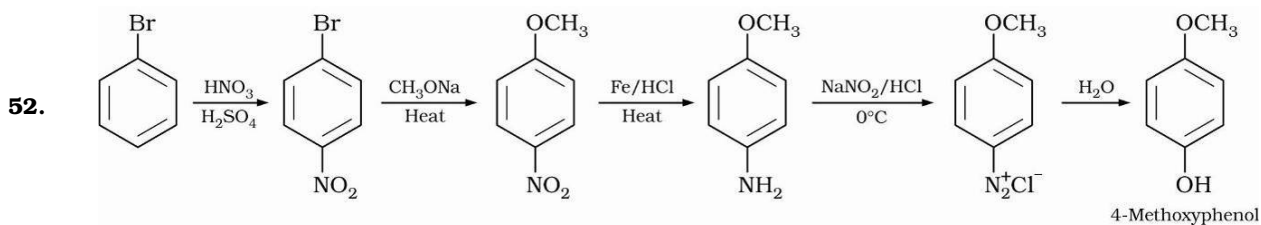
JEE Advanced [Archive]



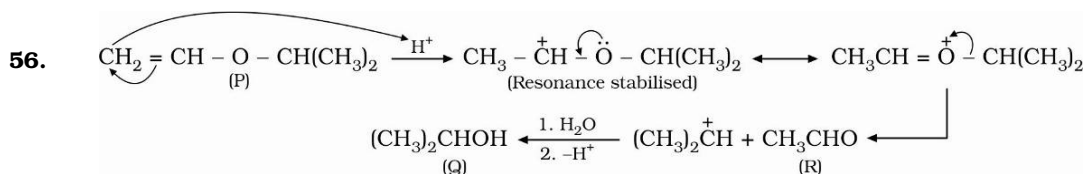
Due to strong +M effect, phenol is more reactive towards electrophilic substitution. Thus statement-I is correct.



Due to +M effect of -OH group, the intermediate arenium ion generated is also more stabilised. Thus statement-II is also correct and explains statement-I as well.



55.(A) $\text{C}_2\text{H}_5\text{O}^-$ (as a strong base) will first abstract a proton from phenol to give a phenoxide ion (a resonance stabilised ion). It will attack the methyl carbon of alkyl iodide to form $\text{C}_6\text{H}_5\text{OC}_2\text{H}_5$ ($\text{S}_{\text{N}}2$). However if $\text{C}_2\text{H}_5\text{O}^-$ is in excess, then $\text{C}_2\text{H}_5\text{OC}_2\text{H}_5$ will be formed because $\text{C}_2\text{H}_5\text{O}^-$ is a better nucleophile than $\text{C}_6\text{H}_5\text{O}^-$.

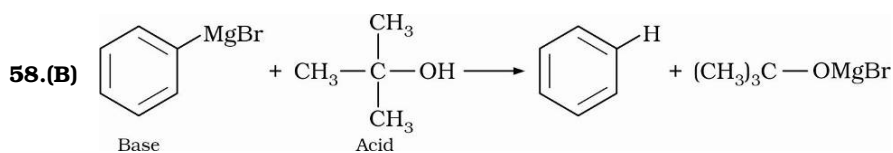


➤ Both P and Q respond positively to iodoform test.

Note : (i) When π e's are in conjugation with lone pair over O [Vinylic ethers], then visualise the above pathway to form a stable carbocation and subsequent formation of carbonyl compound.

(ii) The above reaction is faster because of formation of highly stable carbocations as compound to poorly stable CH_3CH_2^+ (1°) from ethylene.

57.(B) Concentrated HCl, HBr and $\text{HCl} + \text{ZnCl}_2$ all are nucleophiles that convert alcohols to alkyl halide. Conc. H_3PO_4 is a dehydrating agent which will give alkene.

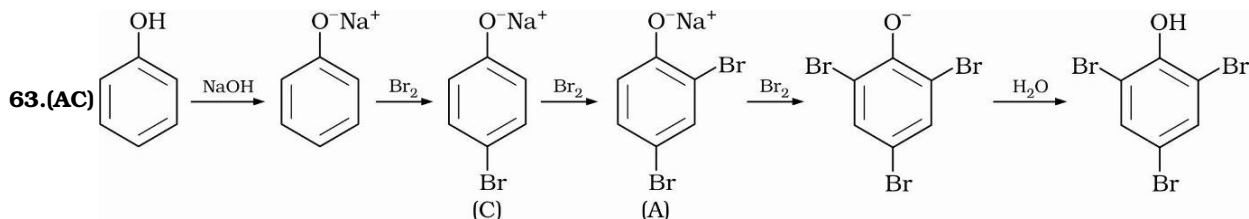


59.(C) 1, 4-dihydroxy benzene shows highest boiling point among the given compounds due to formation of strong intermolecular H-bonding.

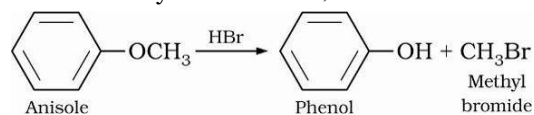
Order of H-bonding among the isomers - o < m < p

Thus order of boiling point is : IV < I < II < III.

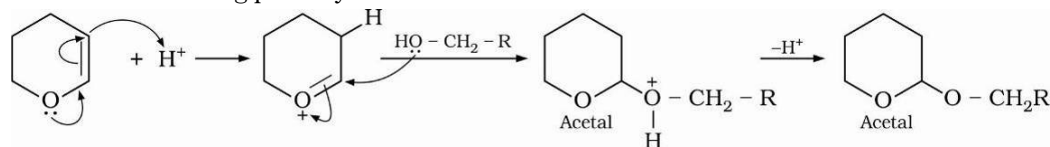
60-62. 60.(B) 61.(C) 62.(C)
Refer to module for mechanism of Riemer-Tiemann reaction.

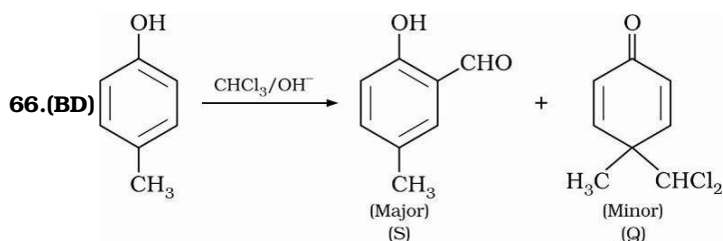


64.(D) Alkyl aryl ethers are cleaved at the alkyl-oxygen bond due to stronger aryl-oxygen bond. The reaction yields phenol and alkyl halide. Thus,

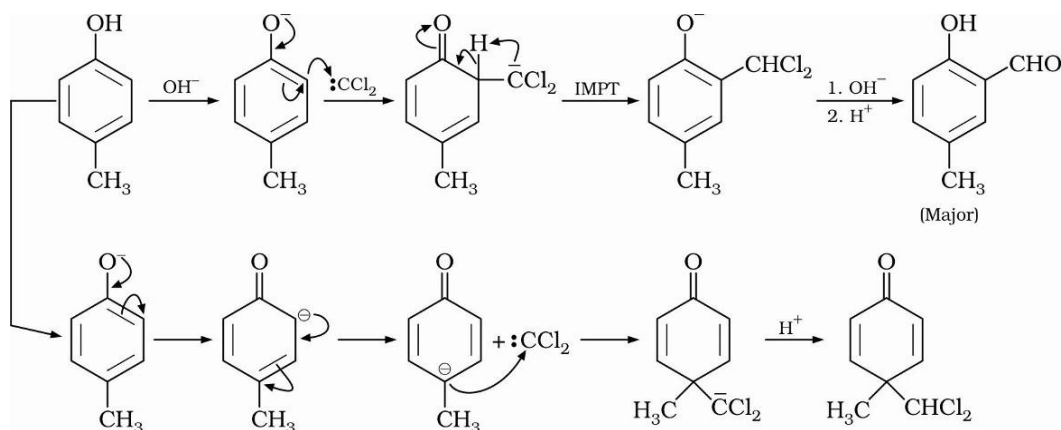


65.(B) If the lone pair is conjugated with π -bond and conditions are anhydrous (which do not support cleavage easily), visualise the following pathway.



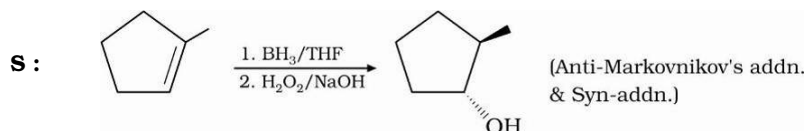
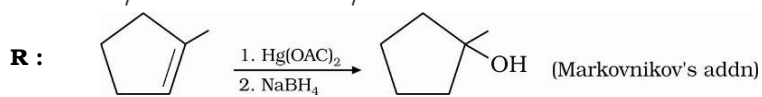
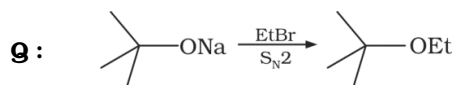
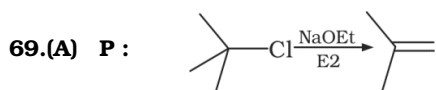


The above reaction is Reimer Tiemann Reaction, where intermediate formed is :CCl_2 carbene.




67.(D) Phenol is weaker acid than carbonic acid (H_2CO_3) and does not liberate CO_2 on treatment with aqueous sodium bicarbonate solution.

- 68.(B) ➤ It is an example of *ipso* substitution
➤ Refer to Solution of Q.87



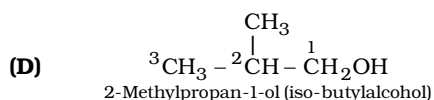
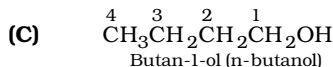
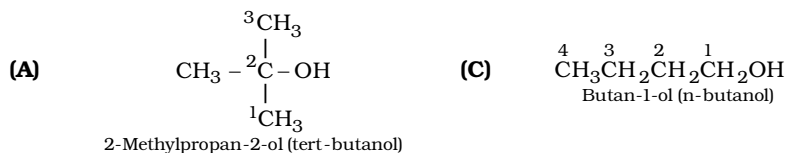
70.(C) Acidic hydrolysis of benzylic ethers follow $\text{S}_\text{N}1$ pathway and rate of $\text{S}_\text{N}1$ reaction depends on the stability

of carbocation. When two phenyl rings are replaced by  group, the carbocation will be more stabilized due to +M effect of $-\text{OMe}$ group.

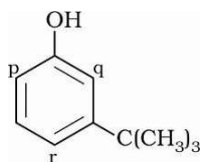
71.(D) In Dye-test, phenolic $-OH$ groups is converted to $-O^-$ which activates the ring towards EAS (Electrophilic aromatic substitution).

72.(ACD)

$C_4H_{10}O$ is monohydric alcohol, i.e., C_4H_9OH . Its isomeric alcohols are

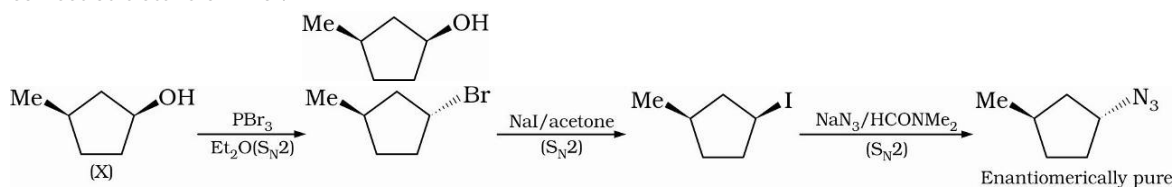


73.(ABC)



p, q and r are suitable positions as per strongly activating nature of (electronic effect) $-OH$ group via +M effect. Due to steric effect of the tert-butyl group, the bulky electrophiles are less likely to attack positions q and r. Hence, only position p is suitable for I_2 , positions p and r are suitable for Br_2 and Cl_2 being smaller can attack on all p, q and r positions.

74.(B) Observe that all three reactions involved are S_N2 and proceed via inversion of configuration. So the correct structure of X is :



Enantiomerically pure product after several substitution reaction, is only possible when each reaction is stereospecific in nature which confirms the pathway used is S_N2 in nature.