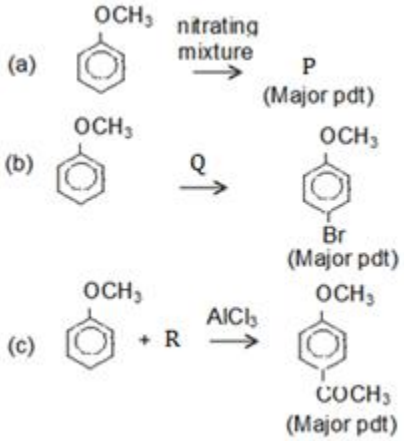
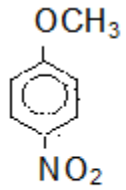
Alcohols, Phenols and Ethers

Que 1: Identify P, Q & R in the following reactions: ***Marks :(3)***



Ans:

P :



Q : Br_2 in acetic acid

R : CH_3COCl

Que 2: The incorrect one among the following is: ***Marks :(1)***

(a) $C_2H_5 - O - C_2H_5 \xrightarrow{\text{Excess HI}} 2C_2H_5I + H_2O$

(b) $CH_3 - O - CH_2 - CH_3 + HI \longrightarrow CH_3I + CH_3 - CH_2 - OH$

(c) $CH_3 - \underset{\underset{CH3}{|}}{\overset{\overset{CH_3}{|}}{C}} - O - CH_3 + HI \longrightarrow CH_3 - \underset{\underset{CH3}{|}}{\overset{\overset{CH_3}{|}}{C}} - OH + CH_3I$

(d) $C_6H_5 - O - CH_3 + HI \longrightarrow C_6H_5 - OH + CH_3I$

Ans: (c)

Que 3: Arrange the following compounds in their increasing order of acidic strength and justify your answer: ***Marks :(3)***

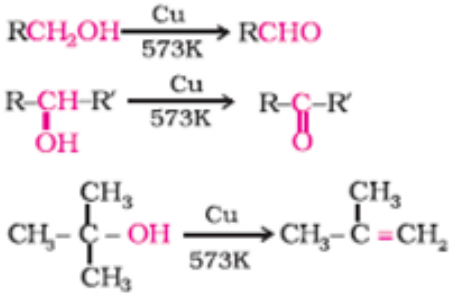
(a) Phenol (b) p-nitrophenol (c) p-methylphenol and (d) Chlorophenol

Ans: p-methylphenol < Phenol < p- chlorophenol < p-nitrophenol

Justification: Electron withdrawing groups at o- & p-positions increase acidic strength and electron releasing groups at o- & p- positions decrease acidic strength. The electron withdrawing effect of $-NO_2$ > -Cl and $-CH_3$ group is electron releasing.

Que 4: Oxidation with hot Copper Catalyst can be used to distinguish 1^0 , 2^0 and 3^0-alcohols. Explain. ***Marks :(3)***

Ans: A primary alcohol gives aldehyde, a secondary alcohol gives ketone and a tertiary alcohol gives an alkene on treatment with hot copper catalyst as given below:



Que 5: Write the name of the oxidising agent which can effect the following conversion:

CH_3-CH=CH-CH_2OH → CH_3-CH=CH-CHO ***Marks :(1)***

Ans: Pyridinium Chloro Chromate

Que 6: Arrange the given set of compounds in their increasing order of boiling points:

(a) C_2H_5OH, CH_3CH_2Cl, CH_3-O-CH_3

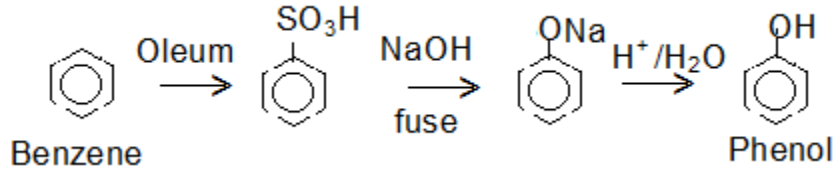
(b) C_6H_5OH, $C_6H_5CH_3$, C_6H_5Cl ***Marks :(3)***

Ans: (a) CH_3-O-CH_3 < CH_3-CH_2-Cl < CH_3-CH_2-OH

(b) C_6H_5-CH_3 < C_6H_5 –Cl < C_6H_5- OH

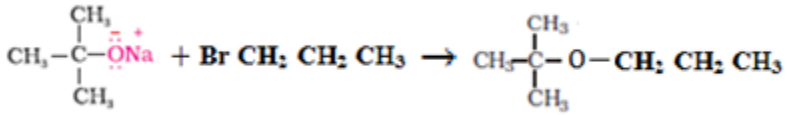
Que 7: How will you convert Benzene into Phenol? ***Marks :(3)***

Ans:



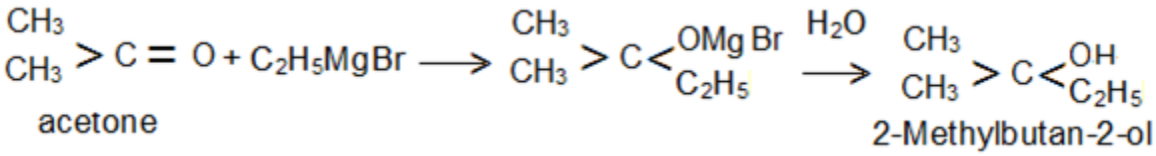
Que 8: Write the chemical reaction representing the preparation of propyl tert-butyl ether (2-methyl-2- propoxy propane) by Williamson's synthesis method. ***Marks :(2)***

Ans:



Que 9: Write the sequence of reactions which results in the formation of 2-Methylbutan-2-ol starting from acetone ***Marks :(3)***

Ans:



Que 10: The incorrect statement regarding the preparation of alcohols by different methods is:

(a) Formaldehyde when treated with RMgX followed by hydrolysis gives a primary alcohol

(b) Acid catalysed hydration of alkenes to give alcohols occurs in accordance with Markovnikov's rule.

(c) Hydroboration-Oxidation of alkenes gives a final product in accordance with Markovnikov's rule.

(d) Carboxylic acids produce only primary alcohols on reduction. ***Marks :(1)***

Ans: (c)

Que 11: The correct pair of common and IUPAC names among the following is: ***Marks :(1)***

(a)Sec- Butyl alcohol : Butan-1-ol

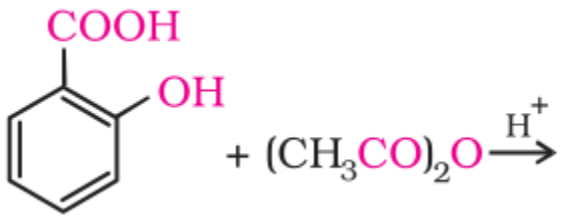
(b)Isobutyl alcohol : 2-Methylbutan -1-ol

(c)n-Butyl alcohol : Butan-2-ol

(d)tert-Butyl alcohol : 2-Methylpropan-2-ol

Ans: (d)

Que 12: Give the products of the following reaction? ***Marks :(2)***



Ans: