

Gaining Apex Coaching Centre

(Where Toppers make..... Toppers)

Compiled by: Dapinder Sir

Assignment -I Alcohol, Phenol & Ethers

- 1) Write the mechanism of the following reaction



- 2) Explain the following observations:

- (i) The boiling point of ethanol is higher than that of methoxymethane.
- (ii) Phenol is more acidic than ethanol.
- (iii) o- and p-nitrophenols are more acidic than phenol.

- 3) How do you convert the following:

- (i) Phenol to anisole
- (ii) Propan-2-ol to 2-methylpropan-2-ol
- (iii) Aniline to phenol

- 4) Explain (ii) The C—O—H bond angle in alcohols is slightly less than the tetrahedral angle ($109^\circ 28'$).

- (iii) $(\text{CH}_3)_3\text{C}-\text{O}-\text{CH}_3$ on reaction with HI gives $(\text{CH}_3)_3\text{C}-\text{I}$ and CH_3-OH as the main products and not $(\text{CH}_3)_3\text{C}-\text{OH}$ and CH_3-I .

- 5) The C-O bond is much shorter in phenol than in ethanol. Give reason.

- 6) Of the two hydroxy organic compounds ROH and R'OH, the first one is basic and other is acidic in behaviour. How is R different from R'?

- 7) Give a chemical test to distinguish between 2-Pentanol and 3-Pentanol

- 8) How would you obtain ethane-1, 2-diol from ethanol?

- 9) How would you obtain acetophenone from phenol?

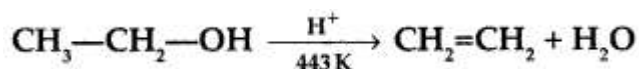
- 10) Which of the following isomers is more volatile: o-nitrophenol or p-nitrophenol?

- 11) How are the following conversions carried out?

- (i) Benzyl chloride to benzyl alcohol,
- (ii) Methyl magnesium bromide to 2-methylpropan-2-ol.

- 12) Explain the mechanism of acid catalyzed hydration of an alkene to form corresponding alcohol

- 13) Explain the mechanism of the following reaction:



- 14) Write the mechanism of acid dehydration of ethanol to yield ethene.

- 15) Arrange the following compounds in the increasing order of their acid strength: p-cresol, p-nitrophenol, phenol

- 16) Explain the following observations:

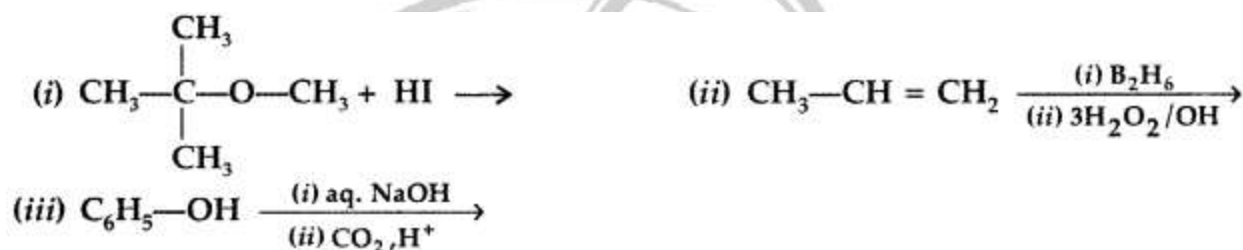
- (i) The boiling point of ethanol is higher than that of methoxymethane.

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- (ii) Phenol is more acidic than ethanol.
- (iii) o- and p-nitrophenols are more acidic than phenol.
- 17) Give a separate chemical test to distinguish between the following pairs of compounds:
- (i) Ethanol and Phenol (ii) 2-Pentanol and 3-Pentanol
- (b) Explain Kolbe's reaction with the help of suitable example
- 18) How are the following conversions carried out?
- (i) Propene to propan-2-ol
- (ii) Benzyl chloride to Benzyl alcohol
- (iii) Anisole to p-Bromoanisole
- 19) Write the main product(s) in each of the following reactions:



- 20) What happens when
- a) Anisole is treated with CH_3Cl / Anhydrous AlCl_3
- b) Phenol is oxidised with $\text{Na}_2\text{Cr}_2\text{O}_7/\text{H}^+$
- c) Tertiary alcohol is heated with Cu , 573 K
- Write chemical equation in support of your answer
- 21) There is no addition of FeCl_3 in bromination of phenol. Explain
- 22) On the addition of Bromine to phenol in the absence of CCl_4 , trisubstitution occurs While in the presence of CCl_4 disubstitution occurs. Comment
- 23) How will you distinguish between propan-2-ol and Benzyl alcohol, Phenol and Cyclohexanol. Explain with proper reaction
- 24) Protonation of phenol can be done easily. If yes or no, give proper explanation
- 25) Write Riemer-Tiemann, Fries rearrangement P
- 26) Phenol has smaller dipole moment than methanol
- 27) Phenol can be easily nitrated than benzene
- 28) How will you prepare phenol from chlorobenzene
- 29) Write Riemer Tiemann Reaction

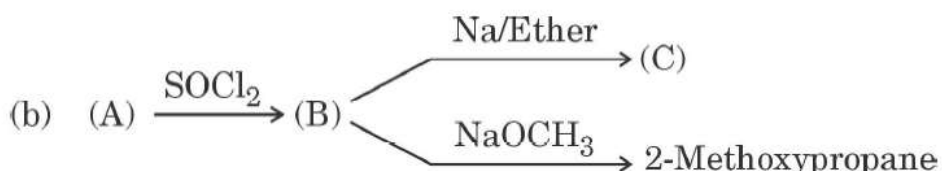
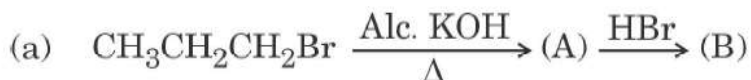
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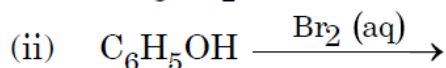
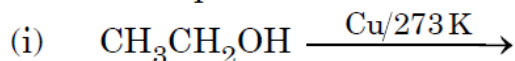
Complete the following reactions :

$$1\frac{1}{2} + 1\frac{1}{2} = 3$$



(a) Predict the products of the following reactions :

$$2 \times 1 = 2$$



OR

(b) Give reasons for the following :

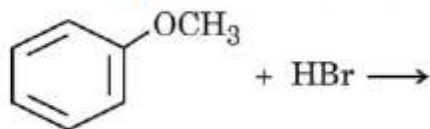
$$2 \times 1 = 2$$

(i) p-nitrophenol is more acidic than p-methylphenol.

(ii) $(\text{CH}_3)_3\text{C} - \text{Br}$ on reaction with NaOCH_3 gives alkene as the main product and not an ether.

(a) (i) Write hydroboration-oxidation reaction with an example.

(ii) Write the products of the following reaction :



(iii) Why is p-nitrophenol more acidic than phenol ?

$$3 \times 1 = 3$$

OR

(b) (i) What happens when phenol reacts with

(1) Conc. HNO_3 , and

(2) CHCl_3 in presence of aqueous NaOH followed by acidification ?

Write equations only.

(ii) Why does the reaction of CH_3ONa with $(\text{CH}_3)_3\text{C} - \text{Br}$ give 2-methylpropene and not $(\text{CH}_3)_3\text{C} - \text{OCH}_3$?

$$2 + 1 = 3$$