Alcohols, Phenols and Ethers

1. **Assertion (A):** Benzyl alcohol is an isomer of p-cresol.

   Reason (R): Benzyl alcohol is also known as Benzenol.

   (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

   (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

   (3) (A) is true but (R) is false

   (4) Both (A) and (R) are false

2. **Assertion (A):** Phenol is stronger acid than alcohols.

   Reason (R): Phenol is stabilized by resonance whereas alcohol are not.

   (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

   (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

   (3) (A) is true but (R) is false

   (4) Both (A) and (R) are false

3. **Assertion (A):** Phenols give picric acid on nitration with conc. HNO_3.

   Reason (R): –OH group in phenol shows –M effect.

   (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

   (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

   (3) (A) is true but (R) is false

   (4) Both (A) and (R) are false

4. **Assertion (A):** m-Nitrophenol is less acidic than p-nitrophenol.

   Reason (R): p-Nitrophenol has intra molecular H-bonding.

   (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

   (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

   (3) (A) is true but (R) is false

   (4) Both (A) and (R) are false

5. **Assertion (A):** Benzene sulphonic acid on heating with NaOH gives sodium phenate.

   Reason (R): Sulphonic group is a poor leaving group.

   (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

   (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

   (3) (A) is true but (R) is false

   (4) Both (A) and (R) are false

6. **Assertion (A):** $Ph–O–CH_3$ can be prepared from PhONa and methyl iodide.

   Reason (R): Aryl halides are less reactive substrates for nucleophilic substitution reaction.

   (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

   (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

   (3) (A) is true but (R) is false

   (4) Both (A) and (R) are false

7. **Assertion (A):** Cumene (isopropyl benzene) reacts with O_2 and after hydrolysis gives phenol and acetone.

   Reason (R): Initially cumene converts into 2-phenylpropan-2-ol.

   (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

   (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

   (3) (A) is true but (R) is false

   (4) Both (A) and (R) are false

8. **Assertion (A):** Methoxy ethane has more boiling point than propanal.

Reason (R): Attraction is more in methoxy ethane than propanal.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

9. **Assertion (A):** Anisole on reaction with HI gives phenol and CH_3I.

Reason (R): Phenol-oxygen bond is stronger than methyl-oxygen bond in anisole and hence is not claved by HI.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

10. **Assertion (A):** In Lucas test, 3° alcohols react immediately.

Reason (R): A mixture of anhydrous $ZnCl_2$ and conc. HCl is called Lucas reagent.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

11. **Assertion (A):** Addition reaction of water to but-1-ene in acidic medium yields butan-1-ol.

Reason (R): Addition of water in acidic medium proceeds through the formation of primary carbocation.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

12. **Assertion (A):** p-nitrophenol is more acidic than phenol.

Reason (R): Nitro group helps in the stabilization of the phenoxide ion by dispersal of negative change due to resonance.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

13. **Assertion (A):** Boiling points of alcohols and ethers are high.

Reason (R): They can form intermolecular hydrogen-bonding.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

14. **Assertion (A):** Like bromination of benzene, bromination of phenol is also carried out in the presence of Lewis acid.

Reason (R): Lewis acid polarizes the bromine molecule.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

15. **Assertion (A):** Phenol forms 2, 4, 6,– tribromophenol on treatment with Br_2 in carbon disulphide at 273 K.

Reason (R): Bromine polarizes in carbon disulphide.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

16. **Assertion (A):** p-Nitrophenol gives more electrophilic substituted compound than m-methoxyphenol

Reason (R): methoxy group shows only negative /-effect.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

17. **Assertion (A):** Phenol is more acidic than ethanol.

Reason (R): Phenoxide ion is resonance stabilised

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

18. **Assertion (A):** Phenol forms 2, 4, 6-tribromo-phenol on treatment with Br_2-water at 273 K.

Reason (R): In Phenol –OH is o, p-directing group.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

19. **Assertion (A):** Phenol undergoes Kolbe reaction whereas ethanol does not.

Reason (R): Phenoxide ion is more basic than ethoxide ion.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

20. **Assertion (A):** o-nitrophenol is more volatile than p-nitrophenol

Reason (R): Intramolecular hydrogen bonding is present in o-nitrophenol while intermolecular H-bonding is in p-nitrophenol.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

21. **Assertion (A):** CH_3OCH_3 and C_2H_5OH has comparable molecular weight but boiling point of C_2H_5OH is more than dimethyl ether.

Reason (R): C_2H_5OH forms intermolecular H-bonding while CH_3OCH_3 forms intramolecular H-bonding.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

22. **Assertion (A):** Ethers behave as bases in the presence of mineral acids

Reason (R): It is due to the presence of lone pair of electrons on the oxygen.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

23. **Assertion (A):** The major products formed by heating $C_6H_5CH_2OCH_3$ with HI are $C_6H_5CH_2I$ and CH_3OH

Reason (R): Benzyl cation is more stable than methyl cation.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

24. **Assertion (A):** The pK_a of acetic acid is lower than that of phenol.

Reason (R): Phenoxide ion is more resonance stabilised.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

25. **Assertion (A):** 2-Butanol on heating with H_2SO_4 gives 2-butene as major product.

Reason (R): Dehydration of 2-butanol follows Saytzeff's rule.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

26. **Assertion (A):** Tertiary alcohol does not form ester with carboxylic acid in the presence of conc. H_2SO_4

Reason (R): Tertiary alcohol undergoes dehydration in the presence of conc. H_2SO_4.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

27. **Assertion (A): Bromination** of phenol in aqueous medium or in CS_2 leads to different products.

Reason (R): Phenol in aqueous medium is more activating towards EAS than it is in CS_2.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

28. **Assertion (A):** The major products formed by heating $C_6H_5CH_2OCH_3$ and HI are $C_6H_5CH_2I$ and CH_3OH.

Reason (R): Benzyl cation is more stable than methyl cation.

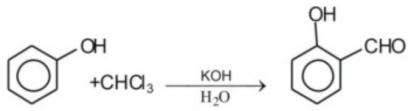
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

29. **Assertion (A):**



Reason (R): Reaction proceeds by carbanion mechanism.

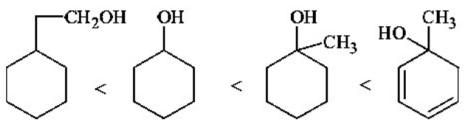
(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

30. **Assertion (A):** Ease of dehydration with H_2SO_4 follows the order:



Reason (R): More stable the carbocation, **easier** the dehydration in acidic medium.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

31. **Assertion (A):** 3^0 alcohols show turbidity within 5 minutes, when treated with lucas reagent.

Reason (R): Conc. HCl and anhydrous $ZnCl_2$ in $1:1$ mixture is called Lucas reagent.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

32. **Assertion (A):** CH_3OH is a nucleophile.

Reason (R): CH_3OH forms sodium methoxide on treatment with $NaOH$

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

33. **Assertion (A):** Primary and secondary alcohol can be distinguished by Victor-Meyer test.

Reason (R): Primary alcohols form nitrolic acids which dissolve in $NaOH$ to form blood red colour but secondary alcohols from pseudonitroles which gives blue colour with $NaOH$

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

34. **Assertion (A):** The acidity of alcohols follows the order $1^0 > 2^0 > 3^0$.

Reason (R): The $+I$ effect of the additional alkyl groups favours the cleavage of $O-H$ bond.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

35. **Assertion (A):** Ether behaves as bases in the presence of mineral acids.

Reason (R): Due to the presence of lone pair of electrons on oxygen.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

36. **Assertion (A):** The boiling point of ethanol is much higher than that of dimethyl ether.

Reason (R): In ethanol, the molecules are associated by the formation of intermolecular hydrogen bonding whereas in diethyl diether it is absent.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3)(A) is true but (R) is false

(4) Both (A) and (R) are false

37. **Assertion (A):** Tert. butyl methyl ether is not prepared by the reaction of tert. butyl bromide with sodium methoxide.

Reason (R): Sodium methoxide is a strong nucleophile.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3)(A) is true but (R) is false

(4) Both (A) and (R) are false

38. **Assertion (A):** With HI, anisole forms iodobenzene and methyl alcohol.

Reason (R): I^- ion will combine with smaller group to avoid steric hindrance.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3)(A) is true but (R) is false

(4) Both (A) and (R) are false

39. **Assertion (A):** t-butyl methyl ether on reaction with HI at 273 K gives tert. butyl iodide and methanol.

Reason (R): The reaction occurs by SN^2 mechanism.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3)(A) is true but (R) is false

(4) Both (A) and (R) are false

40. **Assertion (A):** Phenol is more reactive than benzene towards electrophilic substitution.

Reason (R): In case of phenol, the intermediate carbocation is more resonance stabilized.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3)(A) is true but (R) is false

(4) Both (A) and (R) are false

41. **Assertion (A):** p-nitrophenol is stronger acid than 0 nitrophenol.

Reason (R): Intramolecular hydrogen bonding makes ortho-isomer weaker acid than para isomer.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

42. **Assertion (A):** Phenol is stronger acid than alcohols.

Reason (R): Phenoxide is stabilized by resonance whereas alkoxide is not.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

43. **Assertion (A):** Phenols undergo electrophilic substitution at the ring much more readily than aryl halides.

Reason (R): In aryl halides electron density at the ring decreases due to resonance whereas in phenols it increases.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

44. **Assertion (A):** –OH group in phenols cannot be substituted easily.

Reason (R): C – O bond in phenols has partial double bond character due to resonance.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

45. **Assertion (A):** Sodium salts of phenols can exist in water whereas sodium salts of alcohols do not exist in water.

Reason (R): Phenol is stronger acid than water whereas alcohol is weaker acid than water

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

46. **Assertion (A):** Benzyl alcohol turns blue litmus red.

Reason (R): Benzyl alcohol is an isomer of p-cresol.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

47. **Assertion (A):** Phenol is more reactive than benzene towards electrophilic substitution reactions.

Reason (R): In the case of phenol, the intermediate carbocation is more resonance stabilized.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3)(A) is true but (R) is false

(4) Both (A) and (R) are false

48. **Assertion (A):** p-Nitrophenol is a stronger acid than o-nitrophenol.

Reason (R): Intramolecular H-bonding makes 0 -isomer weaker than p-isomer.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

49. **Assertion (A):** Solubility on n-alcohols in water decreases with increase in molecular weight.

Reason (R): The relative proportion of the hydrocarbon part in alcohols increases with increasing molecular weight which permits enhanced hydrogen bond with water.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3)(A) is true but (R) is false

(4) Both (A) and (R) are false

50. **Assertion (A):** t-Bu toxide is a stronger base than OH^- or $C_2H_5O^-$ ion but is a much poorer nucleophile.

Reason (R): A negatively charged ions is always more powerful nucleophile than its conjugate acid.

(1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)

(2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)

(3) (A) is true but (R) is false

(4) Both (A) and (R) are false

ANSWER KEY																				
Que.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Ans.	3	2	3	3	3	1	3	4	1	2	4	1	4	4	4	4	1	2	3	1
Que.	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Ans.	3	1	1	3	1	1	1	1	3	1	3	1	1	1	1	1	1	2	4	3
Que.	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**										
Ans.	1	1	1	1	2	1	4	1	3	2										