ISC CHEMISTRY

Class XII

Worksheet No. 001

Chapter: Alcohols, Phenols and Ethers

Instructions

A. This worksheet contains a total of 30 questions.
B. Question Nos. 1-20 are MCQ type questions.
C. Question Nos. 21-30 are Assertion-Reason type questions.

1. Which of the following alcohols gives 2-butene on dehydration by conc. H_2SO_4?

a. 2-methyl propene-2-ol
b. 2-methyl 1 -propanol
c. Butane-2-ol
d. Butane 1-ol

2. Which of the following alcohols will give the most stable carbocation during dehydration?

a. 2-methyl-1-propanol
b. 2-methyl-2-propanol
c. 1-Butanol
d. 2-Butanol

3. A compound X with the molecular formula C_3H_8O can be oxidized to another compound Y whose molecular formula is $C_3H_6O_2$. The compound X may be

a. $CH_3CH_2OCH_3$
b. CH_3CH_2CHO
c. $CH_3CH_2CH_2OH$
d. $CH_3CHOHCH_3$

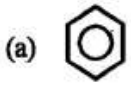
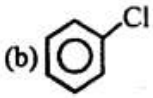
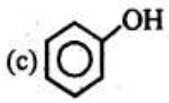
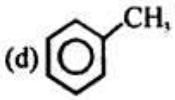
4. Order of esterification of alcohols are

a. 3° > 1° > 2°
b. 2°> 3° > 1°
c. 1 ° > 2° > 3°
d. None of these

5. What happens when tertiary butyl alcohol is passed over heated copper at 300 °C?

a. Secondary butyl alcohol is formed
b. 2-methylpropene is formed
c. 1-butene is formed
d. Butanol is formed

6. Which of the following compounds will be most easily attacked by an electrophile?

(a) 
(b) 
(c) 
(d) 

7. An unknown alcohol is treated with "Lucas reagent" to determine whether the alcohol is primary, secondary or tertiary. Which alcohol reacts fastest and by what mechanism?

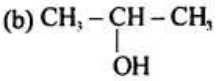
a. Tertiary alcohol by S_N2
b. Secondary alcohol by S_N1
c. Tertiary alcohol by S_N1
d. Secondary alcohol by S_N2

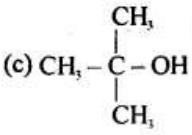
8. An alcohol X when treated with hot conc. H_2SO_4 gave an alkene Y with formula C_4H_8. This alkene on ozonolysis gives single product with molecular formula C_2H_4O. The alcohol is

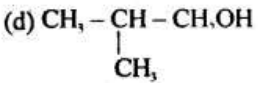
a. butan-1-ol,
b. butan-2-ol
c. 2-methylpropan-1-ol
d. 2,2-dimethylbutynal-1-oI

9. Which of the following alcohols reacts most readily with Lucas reagent?

(a) CH_3-CH_2-CH_2-OH

(b) 

(c) 

(d) 

10. Propanone on reaction with alkyl magnesium bromide followed by hydrolysis will produce

a. primary alcohol
b. secondary alcohol
c. tertiary alcohol
d. carboxylic acid

11. Phenol when treated with excess of bromine water gives a white precipitate of

a. 2, 4, 6-tribromophenol
b. o-bromophenol
c. p-bromophenol
d. bromobenzene

12. Ortho-nitrophenol is less soluble in water than, p- and m- nitrophenols because

a. o-nitrophenol shows intramolecular H-bonding
b. o-nitrophenol shows intermolecular H-bonding
c. melting point of o-nitrophenol is lower than those of m- and p-isomers
d. o-nitrophenol is more volatile in steam than those of m- and p-isomers

13. The best reagent to convert pent-3-en-2-one into pent-3-en- 2-ol is

a. Nitrous acid
b. Lithium aluminium hydride
c. chromic anhydride in glacial acetic acid
d. sodium borohydride

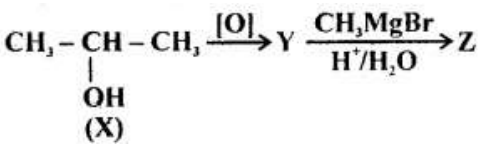
14. The reaction between phenol and chloroform in the presence of aqueous NaOH is

a. nucleophilic substitution reaction
b. electrophilic addition reaction
c. electrophilic substitution reaction
d. nucleophilic addition reaction

15. The most suitable reagent for the conversion of $RCH_2OH \rightarrow RCHO$ is

a. $K_2Cr_2O_7$
b. CrO_3
c. $KMnO_4$
d. PCC

16. In the following reaction sequence Z is



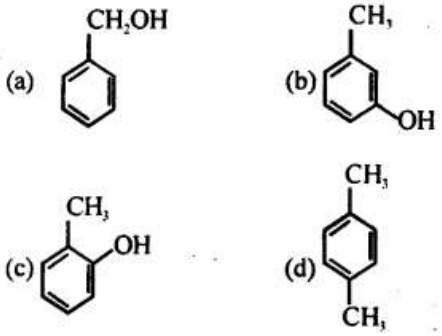
a. butan-1-ol
b. butan-2-ol
c. 2-methylpropan-2-ol
d. 1, 1-dimethylethanol

17. Conversion of phenol to salicyclic acid and to salicyaldehyde are known as (respectively)

a. Reimer-Tiemann reaction and Kolbe's reaction
b. Williamson's synthesis and Hydroboration-oxidation
c. Kolbe's reaction and Williamson's synthesis
d. Kolbe's reaction and Reimer-Tiemann reaction

This worksheet is contributed by Mrs Sobha Joshy and it's proof reading was done by Dr. Noimur Rahman.

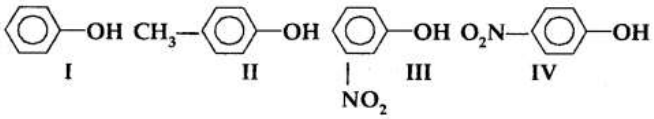
18. Which of the following compounds will give tribromo derivative on treatment with bromine water?



19. The heating of ethyl-methyl ether with HI produces

a. Iodoethane and ethanol
b. Iodoethane and methanol
c. Iodomethane and ethanol
d. Iodomethane and methanol

20. In the following compounds:



The order of acidity is

a. III > IV > I > II
b. I > IV > III > II
c. II > I > III > IV
d. IV > III > I > II

21. **Assertion:** Ethers behave as bases in presence of mineral acids.

Reason: Due to the presence of lone pairs of electrons on oxygen.

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

22. **Assertion: In** case of phenol, bromination takes place even in absence of Lewis acid whereas bromination of benzene takes place in presence of Lewis acid like $FeBr_3$.

Reason: – OH group attached to benzene ring is highly deactivating.

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

23. **Assertion:** Phenol is more reactive than benzene towards electrophilic substitution reaction.

Reason: In the case of phenol, the intermediate carbocation is more resonance stabilized

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

24. **Assertion:** In Lucas test, 3º alcohols react immediately.

Reason: An equimolar mixture of anhyd. $ZnCl_2$ and conc. HCl is called Lucas reagent

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

25. **Assertion** : Addition reaction of water to but-1-ene in acidic medium yields butan-2-ol

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

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

26. **Assertion:** p-nitrophenol is more acidic than phenol.

Reason: Nitro group helps in the stabilisation of the phenoxide ion by dispersal of negative charge due to resonance.

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

27. **Assertion:** Boiling points of alcohols and ethers are high.

Reason: Alcohols can form intermolecular hydrogen-bonding.

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

28. **Assertion:** Ethanol is a weaker acid than phenol.

Reason: phenoxide ion is stabilised by resonance so phenol is more acidic.

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

29. **Assertion (A):** o-Nitrophenol is less soluble in water than the m- and p-isomers.

Reason (R): m-Nitrophenol and p-Nitrophenol exists as associated molecules.

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.

b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

30. **Assertion (A)**: Phenols give o-nitrophenol and p-nitrophenol on nitration with conc. H_2SO_4 and conc. HNO_3 mixture.

Reason (R): $-OH$ group in phenol is o-,p-directing.

a. If both Assertion and Reason are correct and the Reason is a correct explanation of the Assertion.
b. If both Assertion and Reason are correct but Reason is not a correct explanation of the Assertion.
c. If the Assertion is correct but Reason is incorrect.
d. If Assertion is incorrect and Reason is correct.

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Answers:

1. a
2. b
3. c
4. c
5. b
6. c
7. c
8. b
9. c
10. c
11. a
12. a
13. d
14. c
15. d
16. c
17. d
18. b
19. c
20. d
21. a
22. c
23. a
24. b
25. b
26. a
27. d
28. a
29. b
30. d