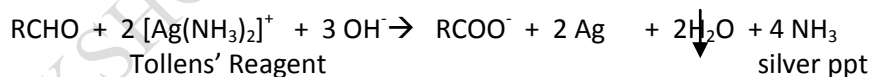


CHEMICAL TEST TO DISTINGUISH BETWEEN PAIR OF COMPOUNDS**LEVEL A**

TEST	REAGENT	INFERENCE
1- Iodoform test(Alcohols)		
2-Lucas test (1° , 2° , & 3° Alcohols)	ZnCl_2/HCl	Turbidity immediately in 3° Alcohols
3-Neutral ferric chloride test (Phenol)	Neutral FeCl_3	Voilet colour
4-Bromine water test(Phenol)	$\text{Br}_2/\text{H}_2\text{O}$	White ppt
5-Iodoform test(Aldehydes&Ketones - COCH_3 , Alcohol(- $\text{C}(\text{OH})\text{CH}_3$)	NaOH/I_2	Yellow Ppt of CHI_3
6-Tollens test(Aliphatic & Aromatic Aldehydes)	Amm. AgNO_3	Silver mirror at walls of test tube
7-Fehling test(Aliphatic Aldehydes)	Fehling A & Fehling B	Reddish Brown ppt of Cu_2O
8-Azo dye test(Aniline)	Aniline forms BDC with $\text{NaNO}_2 + \text{HCl}$ than reacts with β -naphthol	
9-Isocyanide test(1° Aniline)	$\text{CHCl}_3 + \text{KOH}$	Unpleasant odour or smell of Isocyanide
10-Heinsberg test(1° , 2° , 3° Amines)	$\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$	Product of 1° Amines soluble in alkali. Product of 2° Amines are insoluble in alkali.
11-Sodium bicarbonate test (Acids)	NaHCO_3	Effervescence due to CO_2
12. aq. NaOH and AgNO_3 test Test		Ppt formed if -Cl/-X directly attached to sp^3

Distinguish By a Single Chemical Test(WITH CHEMICAL EQUATION)**LEVEL B**

1. All aldehydes (R-CHO) give **Tollens' Test** and produce silver mirror.

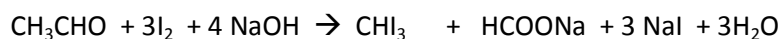


Note: HCOOH (methanoic acid) also gives this test, ketones(RCOR) do not give this test

2. All aldehydes (R-CHO) and ketones(RCOR) give **2,4-DNP test**



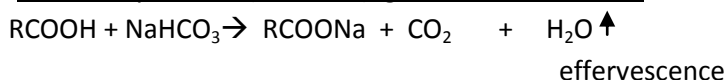
Aldehydes and ketones having $\text{CH}_3\text{CO-}$ (keto methyl) group give Iodoform Test. Alcohols having $\text{CH}_3\text{CH-}$ group also give Iodoform Test.



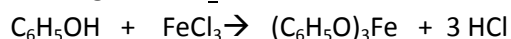
Yellow ppt

The following compounds give Iodoform Test: ethanol ($\text{C}_2\text{H}_5\text{OH}$), propan-2-ol ($\text{CH}_3\text{CH}(\text{OH})\text{CH}_3$), ethanal (CH_3CHO), propanone (CH_3COCH_3), butanone ($\text{CH}_3\text{COCH}_2\text{CH}_3$), pentan-2-one ($\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$), acetophenone (PhCOCH_3)

4. All carboxylic acids (R-COOH) give Bicarbonate Test

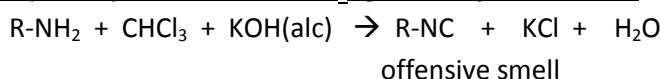


5. Phenol gives FeCl_3 Test

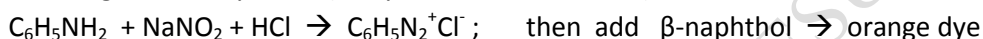


(neutral) (violet color)

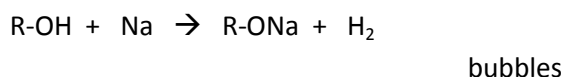
6. All primary amines (R/Ar-NH₂) give Carbyl Amine Test



7. Aniline gives Azo Dye Test (Only for aromatic amines)



8. All alcohols (ROH) give Na-metal test



9. For esters (RCOOR): Hydrolyses first. Then see the products (acid & alcohol) and give a test to identify them

10. All alkenes ($\text{C}=\text{C}$) and alkynes ($\text{C}\equiv\text{C}$) decolorizes Br_2 – water from red to colorless

11. **Lucas Test to distinguish primary, secondary and tertiary alcohols**

Lucas reagent: ZnCl_2/HCl

3^o-alcohol + Lucas reagent \rightarrow immediate turbidity

2^o-alcohol + Lucas reagent \rightarrow turbidity after sometime

1^o-alcohol + Lucas reagent \rightarrow no turbidity

CBSE QUESTIONS

Give one chemical test to distinguish between the following pairs of compounds:

- | | |
|------------------------------------|---|
| 1. Methylamine and dimethylamine | 12. Ethanal and Propanal |
| 2. Secondary and tertiary amines | 13. Acetone and Acetaldehyde |
| 3. Ethylamine and aniline | 14. Acetaldehyde and Benzaldehyde |
| 4. Aniline and benzylamine | 15. Ethanoic acid and Ethnonyl chloride |
| 5. Aniline and N-methylaniline | 16. Methanol and Ethanol |
| 6. Propanal and Propanone | 17. Propanol and Propan-2-ol |
| 7. Acetophenone and Benzophenone | 18. 2-Methyl Propan-2-ol and Propanol |
| 8. Phenol and Benzoic acid | 19. Phenol and Cyclohexanol |
| 9. Benzoic acid and Ethyl benzoate | 20. 1 ^o , 2 ^o , & 3 ^o Alcohols |
| 10. Pentan-2-one and Pentan-3-one | 21. 1 ^o , 2 ^o , & 3 ^o Amines |
| 11. Benzaldehyde and Acetophenone | 22. Formic acid and Acetic acid |

WORK SHEET**Match the following :-**

Sl	Column A	Sl	Column B
1	Neutral Ferric Chloride solution	a	Test for carboxylic acid
2	Iodoform test	b	Test for p-, s- t- alcohol
3	Azodye test ($\text{NaNO}_2 + \text{HCl}$) and beta-naphthol	c	Test for p-, s- t- amines
4	aq. NaOH and AgNO_3 test	d	Test for any aldehyde
5	Hinsberg's reagent (benzene sulphonyl chloride	e	Test for phenol
6	Tollen's Reagent (ammoniacal AgNO_3 solution)	f	Test for chloride
7	Lucas Test (anh. ZnCl_2 + conc. HCl)	g	Test for aliphatic and aromatic 1° -amine
8	NaHCO_3 solution	h	Test for aromatic 1° -amine
9	Isocyanide Test Or Carbylamine Test	i	Test for ethanol. Ethanal ,
10	Fehling's solution (alkaline sol. Of CuSO_4 +	j	Acetophenone

Which one will give + ve test for the reagent

- 1) $\text{NaOH} + \text{I}_2$ (Propanal and Ethanal) .
- 2) Neutral FeCl_3 solution(Phenol , Acetic Acid)
- 3) Ammoniacal AgNO_3 solution (Propanone and Propanal)
- 4) NaHCO_3 solution (Benzoic acid and Phenol)
- 5) CHCl_3 and alcoholic KOH (Ethanamine and N-ethyl Ethanamine)
- 6) Benzene sulphonyl chloride .(2° amine and 3° amine)
- 7) ($\text{NaNO}_2 + \text{HCl}$) and beta-Naphthol (CH_3NH_2 and Aniline)
- 8) anh. ZnCl_2 + conc. HCl (Isopropyl alcohol , Propanone)
- 9) aq. NaOH and AgNO_3 test (Chlorobenzene ,Cyclohexylchloride)
- 10) alkaline sol. Of CuSO_4 + sod. pot. tartarate (Acetone and Acetaldehyde)
- 11) Hinsberg's reagent (Methylamine and dimethylamine)
- 12) Tollen's Test (Formic acid and Acetic acid)
- 13) aq. NaOH and AgNO_3 test (Benzyl chloride and Chlorobenzene)
- 14) Acidic hydrolysis of ester + Iodoform test. (Methyl Acetate and Ethyl Acetate)
- 15) Na-metal test (Ethanol and Ethoxyethane)

MCQ

1. Which of the following compound will give positive iodoform test.
 - a. 3-methylpropan-2-ol
 - b. 1-phenylpropan-1-ol
 - c. 1-methylcyclopentanal
 - d. 3-phenylpropan-2-ol
 - i. a & c
 - ii. a & d
 - iii. b & c
 - iv. b and d
2. Propan-1-ol and propan-2-ol can be distinguished by _____
 - a. Lucas test
 - b. Ferric chloride test
 - c. Tollen's reagent test
 - d. Na metal test
3. Lucas test is associated with _____.
 - a. Alcohol
 - b. phenol
 - c. Aldehyde
 - d. Carboxylic acid

4. _____ alcohol react immediately with anhydrous $\text{ZnCl}_2 + \text{HCl}$ and give insoluble Chloride.
 - a. Methanol
 - b. Butanol
 - c. Isopropylalcohol
 - d. 2- methylpropan-2-ol
5. $\text{C}_2\text{H}_5\text{OH}$ and $\text{C}_6\text{H}_5\text{OH}$ can be distinguished by
 - a. $\text{Br}_2 + \text{H}_2\text{O}$
 - b. $\text{I}_2 + \text{NaOH}$
 - c. FeCl_3
 - d. both B and C
6. $\text{C}_2\text{H}_5\text{CHO}$ and $(\text{CH}_3)_2\text{CO}$ be distinguished by testing with
 - a. Phenyl Hydrazide
 - b. Hydroxylamine
 - c. Fehlings solution
 - d. Sodium Bisulphide
7. Silver mirror test can be used to distinguished between
 - a. Ketone and Acid
 - b. Phenol and Acid
 - c. Aldehyde And Acid
 - d. Alcohol and phenol
8. The pair of compounds in which both the compounds give positive with tollen's reagent
 - a. Glucose and Sucrose
 - b. Fructose and Sucrose
 - c. Acetophenone and Hexanal
 - d. Glucose and Fructose
9. Acetone and Acetaldehyd are differentiated by
 - a. $\text{NaOH} + \text{I}_2$
 - b. $[\text{Ag}(\text{NH}_3)_2]^+$
 - c. HNO_3
 - d. I_2
10. Which of the following pairs can be distinguished by sodium hypoiodite
 - a. CH_3CHO and CH_3COCH_3
 - b. $\text{CH}_3\text{CH}_2\text{CHO}$ and CH_3COCH_3
 - c. $\text{CH}_3\text{CH}_2\text{OH}$ and $\text{CH}_3\text{CH}_2\text{CHOHCH}_3$
 - d. CH_3OH and $\text{CH}_3\text{CH}_2\text{CHO}$
11. CH_3CHO and $\text{C}_2\text{H}_5\text{CH}_2\text{CHO}$ can be distinguished by
 - a. Benedict test
 - b. Iodoform test
 - c. Tollen's test
 - d. Fehlings solution test
12. Dye test can be used to distinguished between
 - a. Ethylamine and Acetamide
 - b. Ethylamine and Aniline
 - c. Urea and Acetamide
 - d. Methylamine and Ethylamine
13. Hinsbergs reagent is :
 - a. Benzenesulphonyl chloride
 - b. Benzenesulphonic acid
 - c. Phenyl iocyanide
 - d. Benzenesulphamide
14. Iodoform can be prepared from, all except.
 - a. Ethyl methyl ketone
 - b. Isopropyl alcohol
 - c. 3-methylbutan-2-one
 - d. Isobutyl alcohol

STATE TRUE OR FALSE

- 1 Formic acid reduces Tollens' reagent
- 2 Carboxylic acids do not give characteristic reactions of carbonyl Group
- 3 Acetic acid does not give sodium bisulphite addition product
- 4 Benzaldehyde does not give Fehling's test.
- 5 Can iodoform be prepared from ethanol ?

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