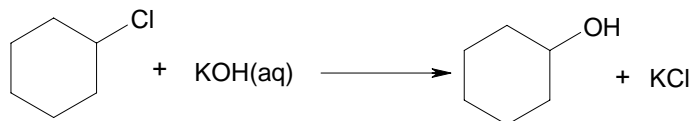


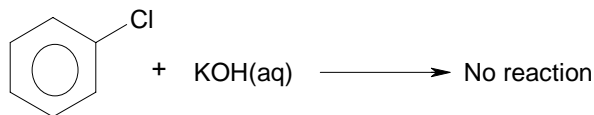
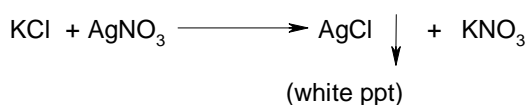
## DISTINCTION BETWEEN SOME PAIRS OF ORGANIC COMPOUNDS (Chemical Tests)

### 1. Chlorobenzene (C<sub>6</sub>H<sub>5</sub>Cl) and chlorocyclohexane (C<sub>6</sub>H<sub>11</sub>Cl)

Add small quantity of aqueous KOH to each compound. Acidify with dil. HNO<sub>3</sub> and add AgNO<sub>3</sub> solution. Chlorocyclohexane gives white ppt while chlorobenzene does not give this test



Chlorocyclohexane



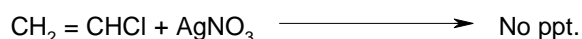
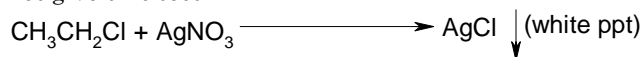
Chlorobenzene

### 2. Chlorobenzene (C<sub>6</sub>H<sub>5</sub>Cl) and Benzyl chloride (C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>Cl)

Benzyl chloride give white ppt, when treated with aq. KOH and acidified AgNO<sub>3</sub> solution. While chlorobenzene does not give this test.

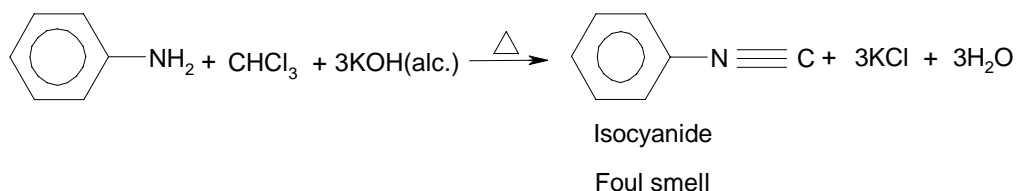
### 3. Ethyl chloride (C<sub>2</sub>H<sub>5</sub>Cl) and vinyl chloride (CH<sub>2</sub> = CHCl)

Ethyl chloride reacts with AgNO<sub>3</sub> solution to give white ppt. of AgCl while vinyl chloride does not give this test



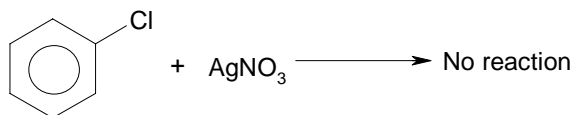
### 4. Carbon tetrachloride (CCl<sub>4</sub>) and chloroform (CHCl<sub>3</sub>)

When chloroform is heated with aniline (C<sub>6</sub>H<sub>5</sub>NH<sub>2</sub>) and alcoholic KOH solution, foul smell of isocyanide (carbylamine) is produced. Carbon tetrachloride does not give this test.



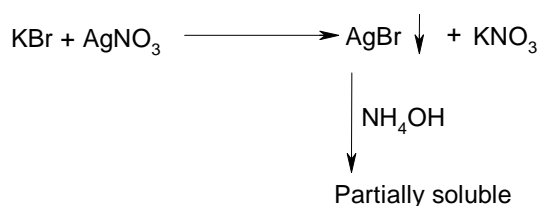
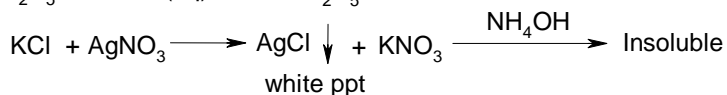
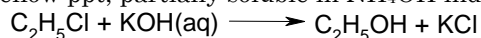
### 5. Chlorobenzene and n-Hexyl chloride (C<sub>6</sub>H<sub>13</sub>Cl)

n-Hexylchloride reacts with at alcoholic AgNO<sub>3</sub> solution to give white ppt. of AgCl while chlorobenzene does not give this test.



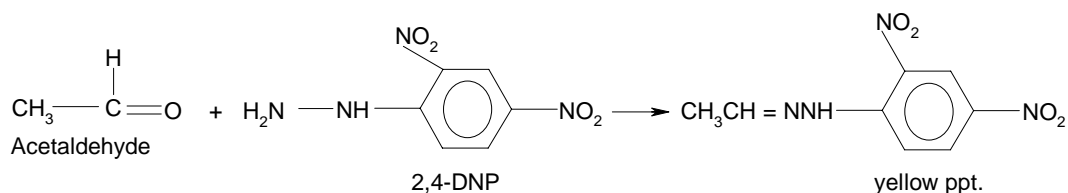
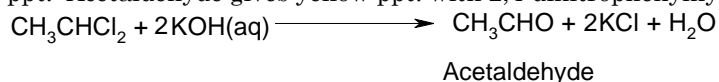
## 6. Chloroethane and Bromoethane

Add small amount of aq. KOH to each compound. Acidify with dil.  $\text{HNO}_3$  and add a few drops of  $\text{AgNO}_3$  solution. A white ppt is insoluble in  $\text{NH}_4\text{OH}$ , indicate chloroethane while light yellow ppt, partially soluble in  $\text{NH}_4\text{OH}$  indicates bromoethane.



## 7. 1, 1- Dichloroethane (geminal dihalide) and 1, 2-Dichloroethane (vicinal dihalide)

Add aq. KOH Solution to each compound, warm and add a few drops of 2, 4-dinitrophenyl hydrazine, 1,1-Dichloroethane forms a yellow ppt while 1,2-dichloroethane does not give the ppt. Acetaldehyde gives yellow ppt. with 2,4-dinitrophenylhydrazine



1,2-Dichloroethane form ethylene glycol with aqueous KOH. Ethylene glycol does not give ppt with 2,4-DNP.

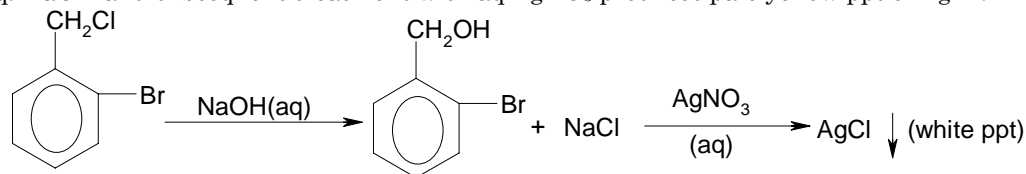


## 8. 3-Bromopropene (allyl bromide) and 1-Bromopropane (alkyl bromide)

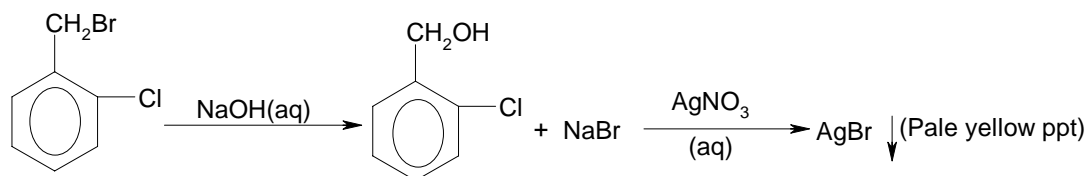
Add a small amount of dil. Alkaline  $\text{KMnO}_4$  solution (Bayer's Reagent) to each compound and shake. 3-Bromopropene ( $\text{CH}_2 = \text{CHCH}_2\text{Br}$ ) decolorizes pink colour of  $\text{KMnO}_4$  while 1-bromopropane ( $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br}$ ) does not give this test.

### 9. o-Bromobenzyl chloride and o-Chlorobenzyl bromide.

o-Bromobenzyl chloride on shaking with aq. NaOH and subsequent treatment with aq. AgNO<sub>3</sub> gives white ppt. of AgCl on the other hand, o-chlorobenzyl bromide on shaking with aq. NaOH and subsequent treatment with aq AgNO<sub>3</sub> produces pale yellow ppt of AgBr.



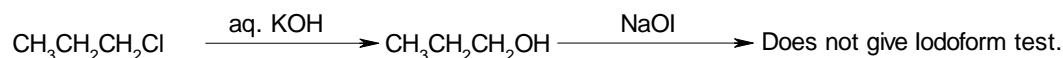
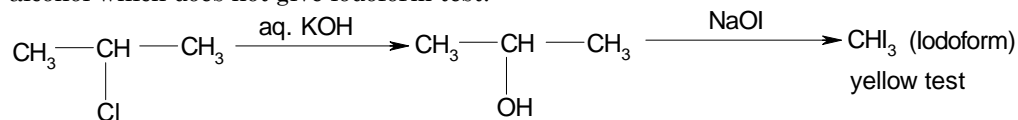
O-Bromobenzyl chloride



O-Chlorobenzyl bromide

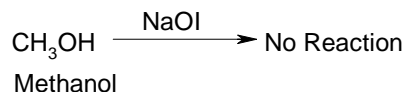
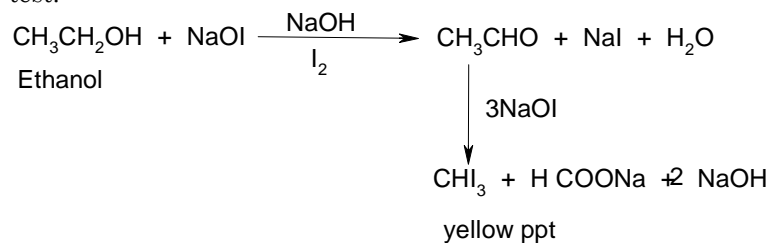
### 10. n-propylchloride and isopropyl chloride

Isopropyl chloride on treated with aq. KOH gives isopropyl alcohol which gives yellow ppt with NaOI (Iodoform test). n-Propyl chloride on treated with aq. KOH gives n-Propyl alcohol which does not give iodoform test.



### 11. Methanol (CH<sub>3</sub>OH) and Ethanol (CH<sub>3</sub>CH<sub>2</sub>OH)

Ethanol gives iodoform test (Yellow ppt. of CHI<sub>3</sub>) whereas methanol does not give iodoform test.



### 12. Ethanol (C<sub>2</sub>H<sub>5</sub>OH) and Benzyl alcohol (C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>OH)

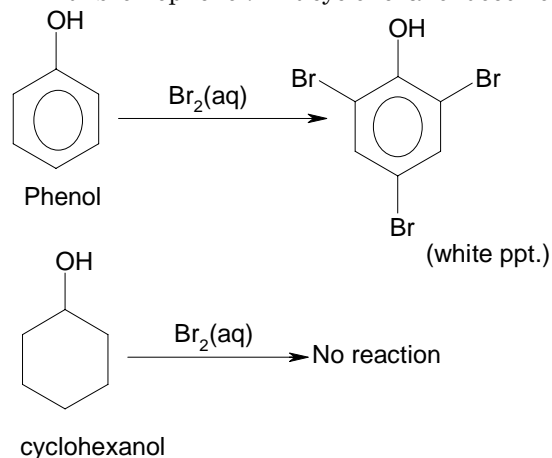
Ethanol gives iodoform test whereas benzyl alcohol does not give iodoform test.

### 13. Ethanol (C<sub>2</sub>H<sub>5</sub>OH) & Phenol (C<sub>6</sub>H<sub>5</sub>OH)

- (i) Ethanol gives iodoform test whereas phenol does not give yellow ppt of iodoform
- (ii) Phenol reacts with neutral FeCl<sub>3</sub> solution to give purple colour whereas ethanol does not give any colour with neutral FeCl<sub>3</sub> solution.
- (iii) Phenol gives coloured dye with benzene diazonium chloride. Ethanol does not give any dye.
- (iv) Phenol readily decolourises bromine water giving a white ppt. 2, 4, 6-tribromophenol but ethanol does not.

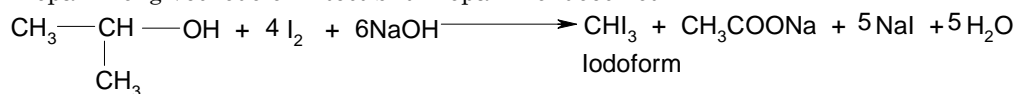
### 14. Phenol (C<sub>6</sub>H<sub>5</sub>OH) and Cyclohexanol (C<sub>6</sub>H<sub>11</sub>OH)

- (i) Phenol gives purple colouration with neutral FeCl<sub>3</sub> while cyclohexanol does not give.
- (ii) Phenol gives coloured dye with benzene diazonium chloride whereas cyclohexanol does not.
- (iii) Phenol readily decolourises bromine water giving a white ppt. 2, 4, 6-tribromophenol. But cyclohexanol does not.



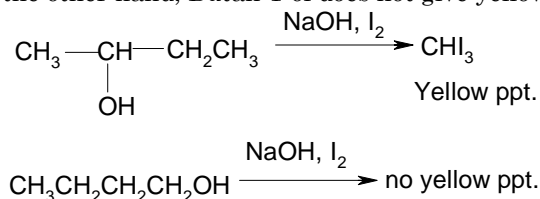
### 15. Propan-1-ol (CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>OH) and Propan-2-ol [CH<sub>3</sub>CH(OH)CH<sub>3</sub>]

Propan-2-ol gives iodoform test but Propan-1-ol does not

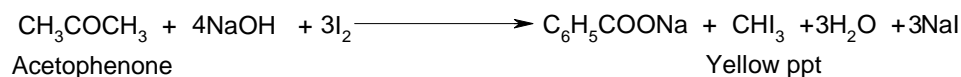


### 16. Butan-1-ol and Butan-2-ol

Butan-2-ol contains (CH<sub>3</sub>CHOH) group and give yellow ppt. with NaOH, I<sub>2</sub> (Iodoform test). On the other hand, Butan-1-ol does not give yellow ppt. with NaOH, I<sub>2</sub>

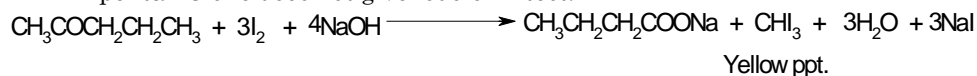






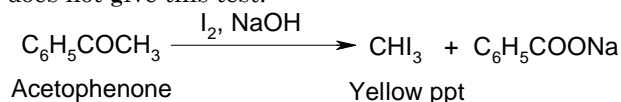
## 22. Pentan-3-one and Pentan-2-one

- (i) Pentan-2-one forms yellow ppt with alkaline solution of iodine (iodoform test) but pentan-3-one does not give iodoform test.



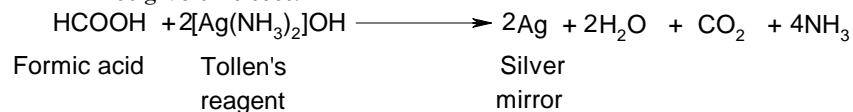
## 23. Acetophenone and Benzophenone

Acetophenone gives yellow ppt with alkaline solution of iodine (iodoform test). Benzophenone does not give this test.

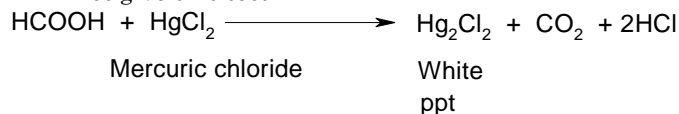


## 24. Formic acid and Acetic acid

- (i) Formic acid gives silver mirror test with Tollen's reagent, Whereas acetic acid does not give this test.



- (ii) Formic acid gives white ppt with mercuric chloride solution while acetic acid does not give this test

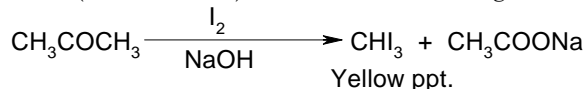


## 25. Acetic acid and Acetone

- (i) Acetic acid reacts with  $\text{NaHCO}_3$  to give effervescence due to evolution of  $\text{CO}_2$ . Acetone does not give effervescence with  $\text{NaHCO}_3$ .



- (ii) Acetone reacts with alkaline solution of iodine to give yellow ppt. due to iodoform (iodoform test). Acetic acid does not give this test.



- (iii) Acetone also gives orange coloured ppt. with 2, 4-DNP while acetic acid does not.

## 26. Phenol and Benzoic acid

- (i) Benzoic acid reacts with  $\text{NaHCO}_3$  to give effervescence due to the evolution of  $\text{CO}_2$ . Phenol does not give effervescence.



- (ii) Phenol gives purple colour with  $\text{FeCl}_3$  solution but benzoic acid does not give such colour.

## 27. Phenol and Acetic acid

- (i) Acetic acid react with  $\text{NaHCO}_3$  to give effervescence due to the evolution  $\text{CO}_2$ . Phenol does not give effervescence.



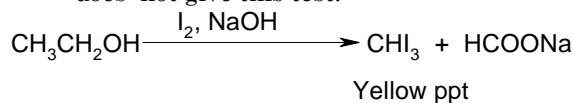
- (ii) Phenol gives purple colour with  $\text{FeCl}_3$  solution but acetic acid does not give such colour.

## 28. Ethanol and Acetic acid

- (i) Acetic acid gives effervescence with  $\text{NaHCO}_3$  due to the liberation of  $\text{CO}_2$ . Ethanol does not give effervescence with  $\text{NaHCO}_3$

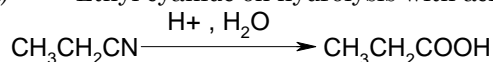


- (ii) Ethanol gives yellow ppt with alkaline solution of  $\text{I}_2$  (iodoform) while acetic acid does not give this test.

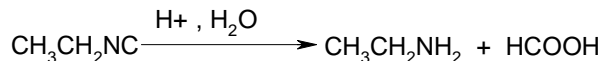


## 29. Ethyl cyanide and ethyl isocyanide

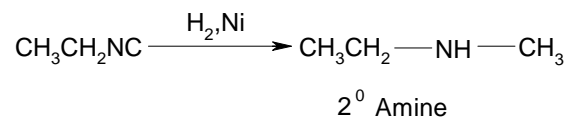
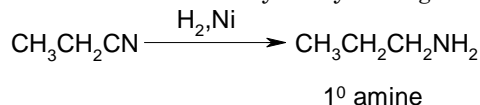
- (i) Ethyl cyanide on hydrolysis with acids gives propanoic acid



On the other hand, ethyl isocyanide with dil.  $\text{HCl}$  gives ethyl amine and formic acid.

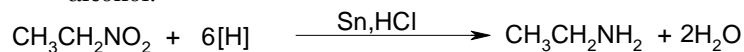


- (ii) Ethyl cyanide on reduction with hydrogen in the presence of  $\text{Ni}$  gives primary amine while ethyl isocyanide give secondary amine.



## 30. Nitroethane and ethyl nitrite

- (i) Nitroethane on reduction with  $\text{H}_2/\text{Ni}$  primary amines while nitrite gives primary alcohol.

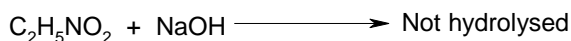
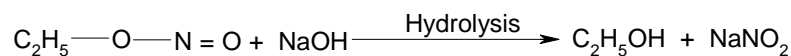


Nitro ethane



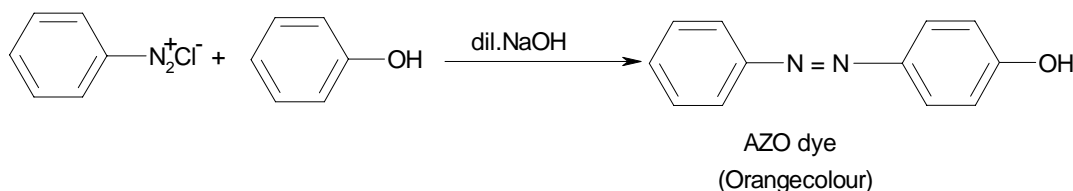
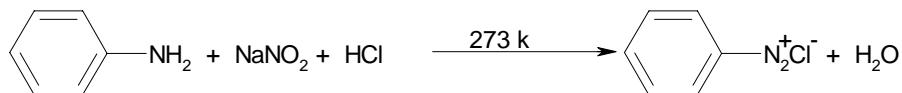
Ethyl nitrite

- (ii) Ethyl nitrite on hydrolysis form alcohol while nitroethane does not get hydrolysed.



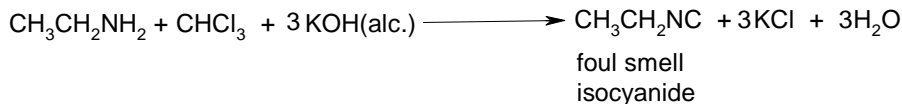
### 31. Ethylamine and Aniline

**Azodye test:-** Dissolve the compound in conc. HCl and add ice-cold solution of  $\text{HNO}_2$  ( $\text{NaNO}_2$  + dil. HCl) and then react, it with an alkaline solution of phenol. Appearance of brilliant orange dye indicates aniline. Ethylamine does not form dye. It will give brisk effervescences due to the evolution of  $\text{N}_2$  but solution remains clear

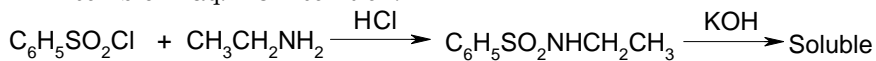


### 32. Ethylamine and diethylamine

- (i) **Carbylamine test:-** When heated with an alcoholic solution of KOH and  $\text{CHCl}_3$ , ethylamine gives foul smell of ethyl isocyanide. Diethylamine does not give the test.



- (ii) **Hinsberg's test:-** When treated with **Hinsberg's reagent** [benzene sulphonyl chloride ( $\text{C}_6\text{H}_5\text{SO}_2\text{Cl}$ )], ethylamine gives N-ethylbenzene sulphonamide which is soluble in aq. KOH solution.



Diethylamine gives N,N-diethyl benzene sulphonamide which is insoluble in aq. KOH

