Alcohols

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Molecular formula of Ethanol: C2H5OH

Structural formula of Ethanol:

Solution 2:

Necessary conditions and equations of getting ethanol from the following are:

- (a) Alkyl halide: alkyl halide on hydrolysis with dilute alkali give alcohol $C_3H_*Br + KOH(aq) \rightarrow C_3H_*OH + KBr$
- (b) An ethene: Ethene is first treated with concentrated sulphuric acid at 80°C when ethyl hydrogen sulphate is formed. Ethyl hydrogen sulphate on hydrolysis with boiling water or steam yield ethanol.

$$\begin{aligned} & \text{CH}_2 = \text{CH}_2 + \text{H}_2 \text{SO}_4 & \xrightarrow{80^{\circ}c} \text{CH}_3 \text{CH}_2 \text{HSO}_4 \\ & \text{CH}_3 \text{CH}_2 \text{HSO}_4 + \text{HOH} & \xrightarrow{bolling} \text{CH}_3 \text{CH}_2 \text{OH} + \text{H}_2 \text{SO}_4 \end{aligned}$$

Solution 3:

- (i) Potassium dichromate and potassium permanganate in the presence of acid.
- (ii) Conc.H₂SO₄
- (iii) Methanol
- (iv) Ethyl alcohol

Solution 4:

Ethanol reacts as follows

(a) Metallic sodium:

$$2C_2H_5OH + 2Na \rightarrow 2C_2H_5ONa + H_2$$

(b) Acetic acid:

$$\texttt{C}_2 \texttt{H}_5 \texttt{OH} + \texttt{CH}_3 \texttt{COOH} + \frac{\texttt{conc.H}_5 \texttt{O}_4}{\texttt{CH}_3 \texttt{COOC}_2 \texttt{H}_5} + \texttt{H}_2 \texttt{O}$$

(c) Conc.H₂SO₄:

$$C_2H_5OH \xrightarrow{\text{concH}_2SO_4} CH_2 = CH_2 + H_2O$$

Solution 5:

- Methylated spirit: Ethyl alcohol mixed with certain percentage of methyl alcohol.
- (ii) Power alcohol:-Petrol:Alcohol in 4:1
- (iii) Spurious alcohol:- Ethyl alcohol mixed with higher percentage of methyl alcohol

Solution 6:

Uses of ethanol:

- (i) In the manufacture of alcoholic beverages
- (ii) As a solvent for paint, oils, perfumes
- (iii) As an antifreeze in automobile radiators

Solution 7:

(i) Ethanol to ethene:

$$\mathsf{C_2H_5OH} \xrightarrow{\quad \textbf{conc.H_2SO_4} \\ \quad 170^{\circ} \mathsf{C}} \mathsf{CH_2} = \mathsf{CH_2} + \mathsf{H_2O}$$

(ii) Bromoethane to ethanol:

$$C_1H_2Br + KOH(aq) \rightarrow C_1H_4OH + KBr$$

Solution 8:

$$C_2H_5OH \xrightarrow{[0]} CH_3CHO \xrightarrow{[0]} CH_3COOH$$
(X)

 $CH_3COOH + C_2H_5OH \xrightarrow{COOC.H_3SO_4} CH_3COOC_2H_5$
(Y)

(X)

(Z)

'X'=Ethyl alcohol

'Y'=Ethanoic acid

'Z'=Ethyl ethanoate