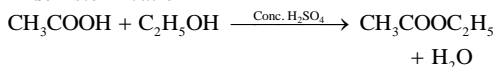


SCIENCE

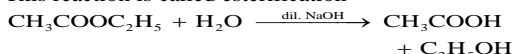
Carbon and its Compounds

37. Write the equation for reaction when acetic acid and ethyl alcohol are warmed together in the presence of conc. H_2SO_4 . Name the reaction. Also write the reaction by which acetic acid and ethyl alcohol can be obtained back from the product formed. Name this reaction also.

Ans: Esterification



This reaction is called esterification



The reaction is called saponification basic or alkaline hydrolysis of ester.

38. A carbon compound X turns blue litmus to red and has a molecular formula $C_2H_4O_2$. Identify X and draw its structure. Write chemical equation for the reaction and name of the product formed in each case when X reacts with

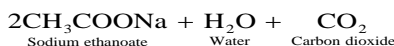
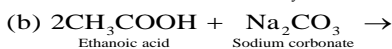
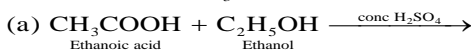
(a) Ethanol in the presence of conc. H_2SO_4

(b) Sodium carbonate.

Ans: 'X' is ethanoic acid.



Its structure is $CH_3 - C - OH$

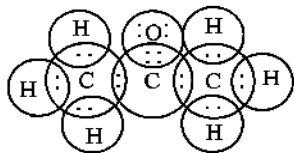
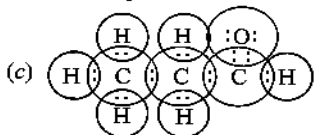
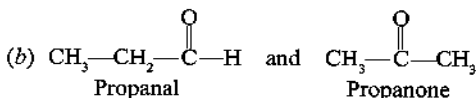


39. (a) Define the term 'isomers'.

(b) Draw two possible isomers of the compound with molecular formula C_3H_6O and write their names.

(c) Give the electron dot structures of the above two compounds

Ans: (a) Isomers are those compounds which have same molecular formula and different structural formula.



40. Why is scum formed only with hard water? Mention the disadvantages of the formation of scum.

Ans: Ca^{2+} and Mg^{2+} present in hard water react with soap to form scum which is insoluble in Ca^{2+} and Mg^{2+} salts of fatty acids.

(i) It is deposited on heating rods of boilers and make them less effective.

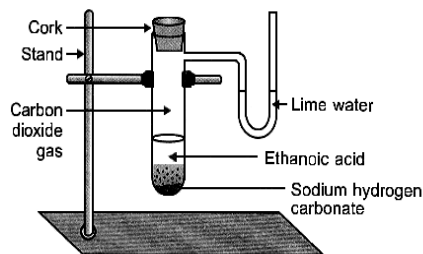
(ii) Soap goes waste and soap forms less lather in hard water.

41. When ethanoic acids reacts with sodium hydrogen carbonate a salt X is formed along with a gas Y. Name X and Y. Describe an activity and draw the diagram of the apparatus used to prove that the gas Y is one which you have named. Also write the chemical equation for the reactions involved.

Ans: 'X' is sodium ethanoate. 'Y' is CO_2 gas.

Aim: To demonstrate the reaction of carboxylic acid with sodium hydrogen carbonate and sodium hydrogen carbonate.

Materials Required: Ethanoic acid, sodium hydrogen carbonate, sodium hydrogen carbonate



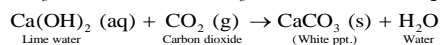
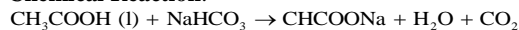
Evolution of carbon dioxide gas by reaction of ethanoic acid with sodium hydrogen carbonate

Procedure:

1. Set the apparatus as shown in diagram.
2. Take 1 g of $NaHCO_3$ and add 2 ml of ethanoic acid into it.
3. Pass the gas formed through lime water and note down the observations.
4. Repeat the same procedure with sodium hydrogen carbonate and record your observations.

Observation: Brisk effervescence due to carbon dioxide formed which turns lime water milky.

Chemical Reaction:



Conclusion: Carboxylic acid reacts with sodium hydrogen carbonate to liberate CO_2 gas which turns lime water milky.

42. An organic compound 'X' on heating with conc. H_2SO_4 forms a compound 'Y' which on addition of one molecule 'Z'. One molecule of compound 'Z' on combustion forms two molecules of CO_2 and three molecules of H_2O . Identify giving reasons the compounds 'X', 'Y' and 'Z'. Write the chemical equations for all the chemical reactions involved.

Ans:

(Contd.....)