

Alcohols lab essay



**ASSIGN
BUSTER**

Activity 1. 7.

2 Synthesis of Esters Purpose- the Purpose of this lab is to synthesize Esters by combining Carboxylic Acid and Alcohols. In this lab we will synthesize and then detect the odour of Esters formed. Materials- Materials that will be used in this lab are as follows:- Ethanol 7. Acetic Acid Eye Protection 11. Test tube rack Procedure- Prepare a hot-water by half filling a 500-mL beaker with water and heating it carefully on a hot plate until it comes to a gentle boil. Number the test in the rack in order you will put the Alcohols in them. Then create a table and write down all the Alcohols in the order you receive and use the table to record your observations. Now place 1mL of specific Alcohol in each of the test tubes.

After putting the Alcohols put 1mL of Acetic Acid in each of the test tube. Now finally add 0. 5mL of concentrated Sulphuric Acid to each of the test tubes. Now gently shake and mix each of the test tubes. Contents of Test Tubes for Synthesizing Esters Questions Page 89 For each of the four reactions, identify the odours of the esters. Methyl Ethanoate combination of Methanol and Carboxylic Acid doesn't have a strong smell and smells somewhat like water. Butyl Ethanoate formed by Butanol and Carboxylic Acid has a very sweet and fruity smell. Propyl Ethanoate formed by Propanol and Carboxylic Acid consist of a strong nail polish remover smell.

Ethyl Ethanoate formed by Ethanol and Carboxylic Acid has a weak nail polish remover smell when compared to Propyl Ethanoate. Draw structural diagram equations to represent each of the three etherification reactions in this investigation. Write the IUPAC name of each reactant and product. What

was the function of the concentrated sulphuric acid in these reactions? The function of the concentrated sulphuric acid in these reactions is that it works like a catalyst. Catalyst basically accelerates the chemical reactions without being actually consumed in the reactions. So basically it fastens the process. What evidence is there that the carboxylic acids used in this investigation are soluble or insoluble in aqueous solution? Explain this evidence in terms of molecular structure of the acids. The carboxylic acids have the hydroxyl group in it, which is also called the alcohol group.

This group contains the hydrogen bond, which is a very strong polar bond, and accounts for the polarity in the molecule. Similarly, aqueous solutions are solutions containing water, and water's molecular structure shows the presence of hydrogen bond consisting of hydrogen and oxygen which makes water the most polar molecule. Therefore the presence of hydroxyl group in carboxylic acids makes it soluble in aqueous solutions containing the same hydroxyl group. {draw: frame} {draw: frame} What evidence is there that the esters synthesized in this investigation are soluble or insoluble in aqueous solution? Explain this evidence in terms of molecular structure of the esters. The solubility of esters depends on the molecular weight of the esters.

Usually esters containing low molecular weights have solubility in water and it decreases as the molecular weight increases. Aqueous solutions contain water and therefore only low molecular weight esters dissolve in aqueous solution. {draw: frame} {draw: frame} The order of solubility of aqueous solution in the esters used in the lab are Methyl Ethanoate > Ethyl Ethanoate

> Propyl Ethanoate > Butyl Ethanoate. This basically means that Methyl Ethanoate is more soluble in water than Ethyl, Propyl and Butyl Ethanoate.