

The oxidation of ethanol essay



**ASSIGN
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Ethanol is a primary alcohol and can be oxidised to produce either an aldehyde or a carboxylic acid. The purpose of this experiment is to oxidise ethanol and then test the product to determine whether it has been oxidised to ethanol or oxidised to ethanoic acid.

Safety

As with all experiments, it is essential to perform procedures safely. In this experiment ethanol, which is highly flammable is being heated so goggles should be worn and hair tied back, a stopper should be used to stop the ethanol from boiling over so that there is no chance of the ethanol being exposed to the naked flame.

When using chemicals such as sodium dichromate, which stains, utmost care must be taken to ensure there are no spillages of the chemical directly or in a solution, gloves should also be worn when handling this chemical. Gloves should also be worn when handling sulphuric acid, which is highly corrosive. Also cuts and broken skin should be covered, and hands should be washed after handling any chemicals. If contact with skin does occur it should be washed with cold water immediately.

Observations

During distillation

As the mixture containing ethanol was added slowly into the pear shaped flask, the mixture in the flask first started to turn a green colour, after about 15 seconds, and as more of the mixture containing ethanol was added the

colour of the mixture became continually darker. The mixture continued to bubble as the mixture containing ethanol was added, showing the mixture was still boiling.

As this bubbling became fiercer, (after about 1 minute) clouds of gas began to form and travel down the tube to the conical flask in iced water, as this continued and the gas condensed giving a colourless distillate in the conical flask. A fruity smell was noticed. The mixture continued boiling for some time after the mixture containing ethanol all been added. Read also salivary amylase experiment After the mixture in the pear shaped flask had stopped boiling two tests were carried out on the distillate to determine whether it was an aldehyde (ethanal) or whether it was a carboxylic acid (ethanoic acid).

Testing of the distillate

The first test was adding 5 drops of the distillate to 5cm of 2, 4-dinitrophenylhydrazine, the result was a yellow/orange precipitate formed, this shows the presence of ethanal an aldehyde. In the second test 5 drops of the distillate and 5 drops of universal indicator was added, after the addition of the universal indicator to the distillate the liquid became red, this shows that an acid, namely ethanoic acid was formed. This suggests to me that the ethanol was oxidised to form ethanal and this ethanal was further oxidised to give ethanoic acid, meaning both products were formed.