

NEATH PORT TALBOT COLLEGE COLEG CASTELL NEDD PORT TALBOT

School of Maths & Science Science Practical

Preparation of Ethanal

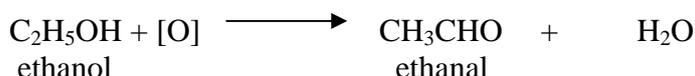
◆ Aim

By the end of this experiment you should be able to;

- (1) Prepare a solution of ethanal from ethanol.
- (2) Carry out chemical tests on the product to identify it.

◆ Introduction

Ethanal is prepared by the oxidation of ethanol with a mixture of sodium dichromate (VI) and dilute sulfuric acid.



Since the ethanal is more readily oxidised than the ethanol, excess of the oxidising Agent must be avoided and the ethanal should be distilled off as it is formed or it will be oxidised to ethanoic acid.

◆ Safety

Control Measures

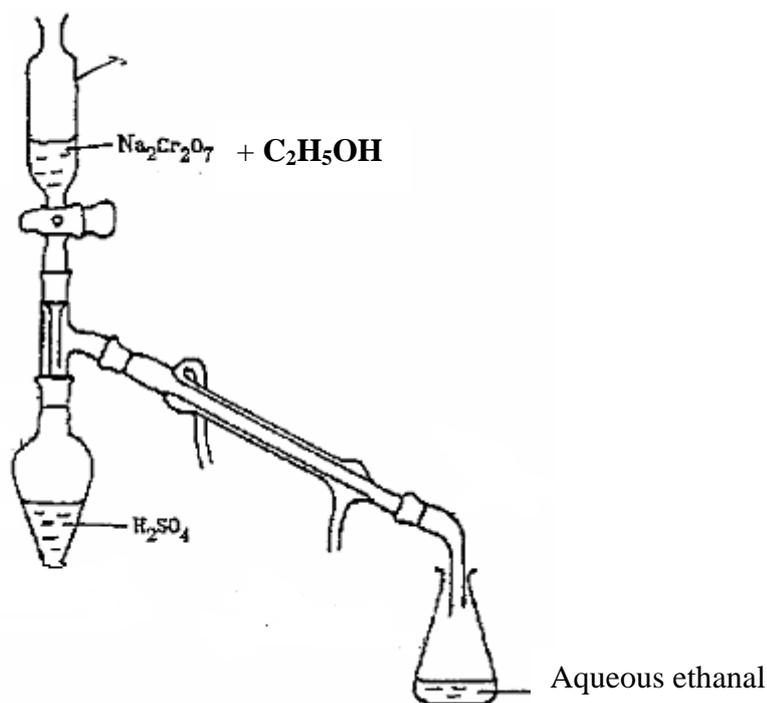
- The wearing of **safety goggles, gloves and a laboratory coat** at all times will be sufficient to take account of most hazards and significant risks.
- Keep stoppers on bottles as much as is possible.
- All waste is to be placed in the labelled container immediately after use.
- You are reminded of the need of good laboratory practise in order to maintain a safe working environment.

Hazards

Harmful	Methylated Spirits, Ethanal
Oxidising, Toxic	Sodium Dichromate, Conc. Sulfuric acid
Corrosive	Conc. Sulfuric acid



◆ Procedure



1. **Carefully** measure out 14cm^3 of sulfuric acid into a 50cm^3 pear shaped flask.
2. Add a few anti-bumping granules. Mix 8.5cm^3 of methylated spirit with 15cm^3 of deionised water in a clean beaker then dissolve (**fully**) 10g of sodium dichromate (VI) in this mixture. Transfer this solution to the separating funnel.
3. **Carefully** heat the acid to boiling point. Remove the flame and **slowly** run the solution (should be a trickle) from the funnel into the flask so that distillation proceeds at a steady rate without further heating. If the rate of addition is too slow, gentle heating may be applied to the flask to maintain a steady rate of distillation.
4. Continue collecting the distillate until all the solution has been added from the funnel and no further distillate is being formed.
5. Pipette some of the distillate into a small container and add a few drops of 2,4 DNP.

Observation;

Inference;

6. Test the remaining distillate by carrying out a silver mirror test on the product. To do this carry out the following steps;

Preparing Tollen's reagent

Add dropwise bench NaOH to 5cm³ of AgNO₃ solution until a brown precipitate of silver oxide is obtained. A solution of dilute ammonia is then added **DROPWISE** until the precipitate is **JUST** converted to the soluble complex ion, [Ag(NH₃)₂]⁺. Tollens reagent has now been made.

Testing the distillate

Add 1cm³ of your product to the tollens reagent and allow to stand. If nothing happens warm carefully in a fume cupboard.

Observation;

Inference;

(7)Write a balanced chemical equation to show the reduction of dichromate (VI)