Edexcel Chemistry A-level

Practical 5

Oxidation of ethanol to produce ethanal and ethanoic acid.

The oxidation of ethanol to **ethanal** (aldehyde) requires **distillation** apparatus. To produce **ethanoic acid** (carboxylic acid), **reflux** apparatus is required.

Method

1. Place the acidified potassium dichromate solution in a pear-shaped flask. Cool down the flask using an ice bath.
2. Add a few anti-bumping granules. These will prevent the formation of large gas bubbles that cause violent boiling.
3. Add ethanol dropwise to the pear-shaped flask. Stir to ensure complete mixing.
4. Warm up the flask to room temperature.
5. Set up the reflux apparatus as shown below, placing the flask in a water bath.
6. Heat using the Bunsen burner for 5-10 minutes.
7. Allow some time for the apparatus to cool down. Afterwards, collect the product via distillation using the equipment shown in the diagram below.

   [Use the thermometer to prevent the temperature from rising too high. Keep the bulb in vapours, never in solution.]
8. To preparing an aldehyde, conduct the same reaction under distillation conditions without the reflux process.

   [For both reactions, the colour change occurs from orange ($Cr_2O_7^{2-}$) to green (Cr^{3+}).]

Diagram - Reflux

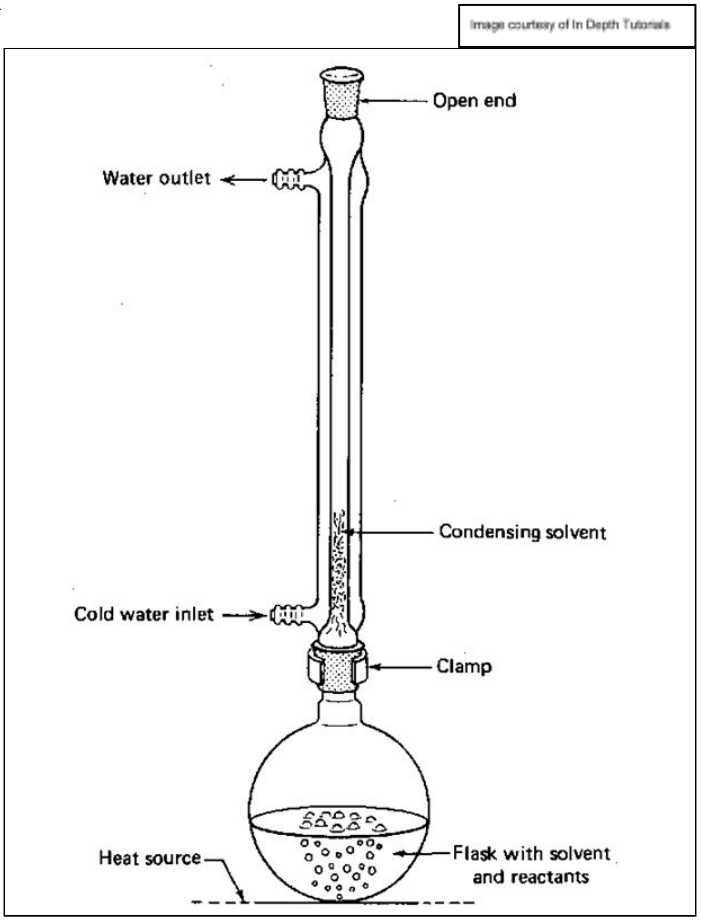

Diagram - Distillation