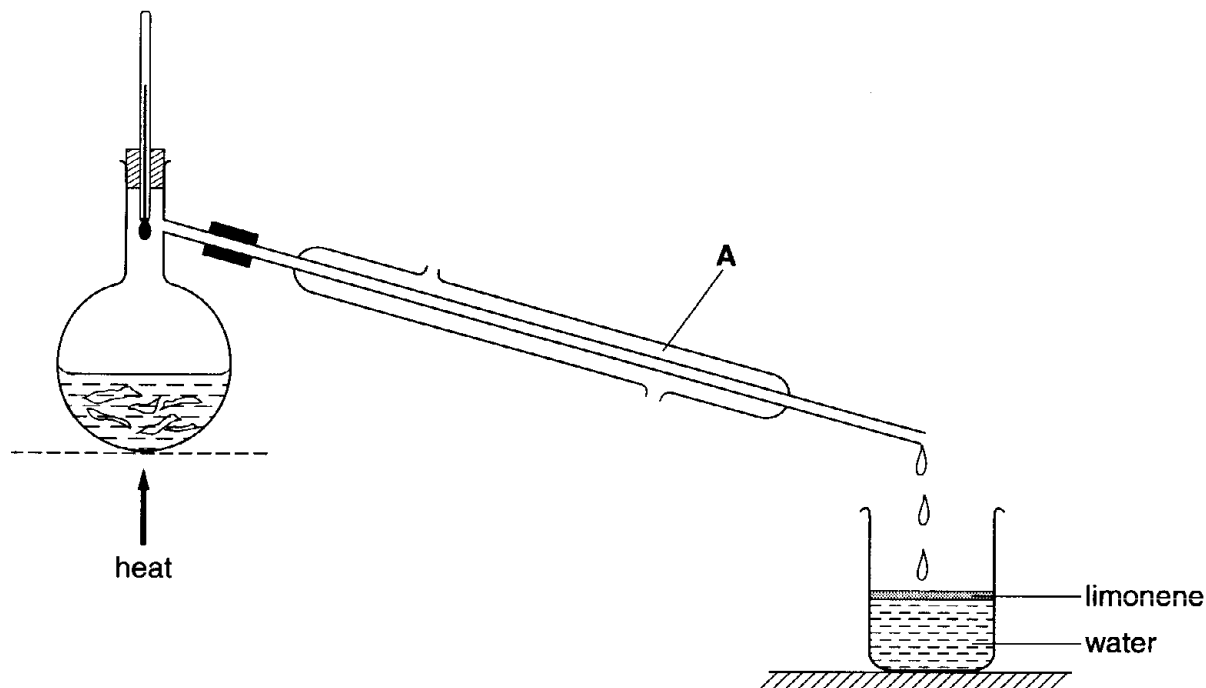


**Core**

Limonene is a liquid hydrocarbon found in orange peel. It can be extracted by boiling orange peel with water, using the apparatus shown below. The mixture of limonene and water distils at a temperature which is 1 °C below the boiling point of water.



(a) (i) State the name of the piece of apparatus labelled **A**.

.....[1]

(ii) Suggest what the reading on the thermometer will be when the limonene-water mixture is being distilled.

..... °C [1]

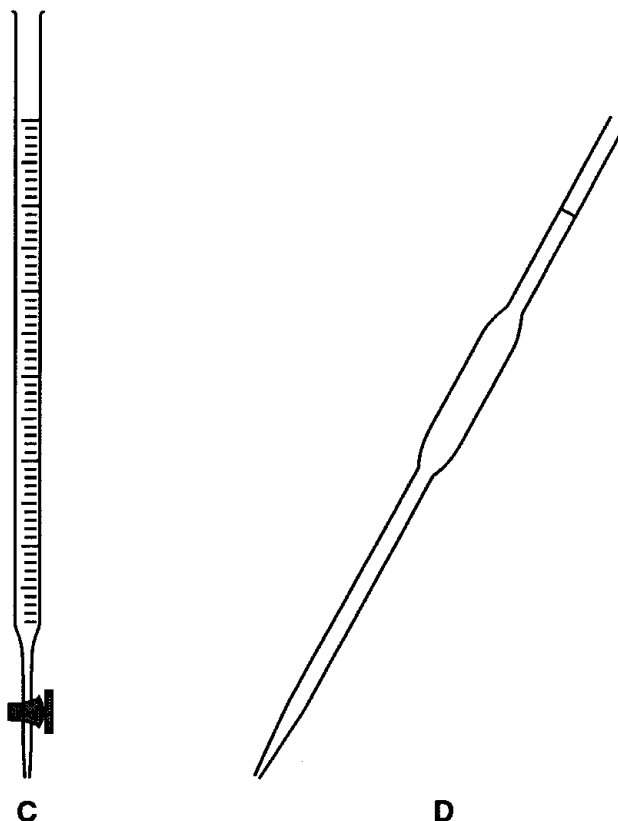
(iii) Limonene is less dense than water. What information in the diagram shows this?

.....[1]

## Alternative to Practical 1

A student used the pieces of equipment shown below to compare the concentration of alkali in two liquid oven cleaners.

Oven cleaners contain the alkali sodium hydroxide.



(a) Name the pieces of equipment.

C .....

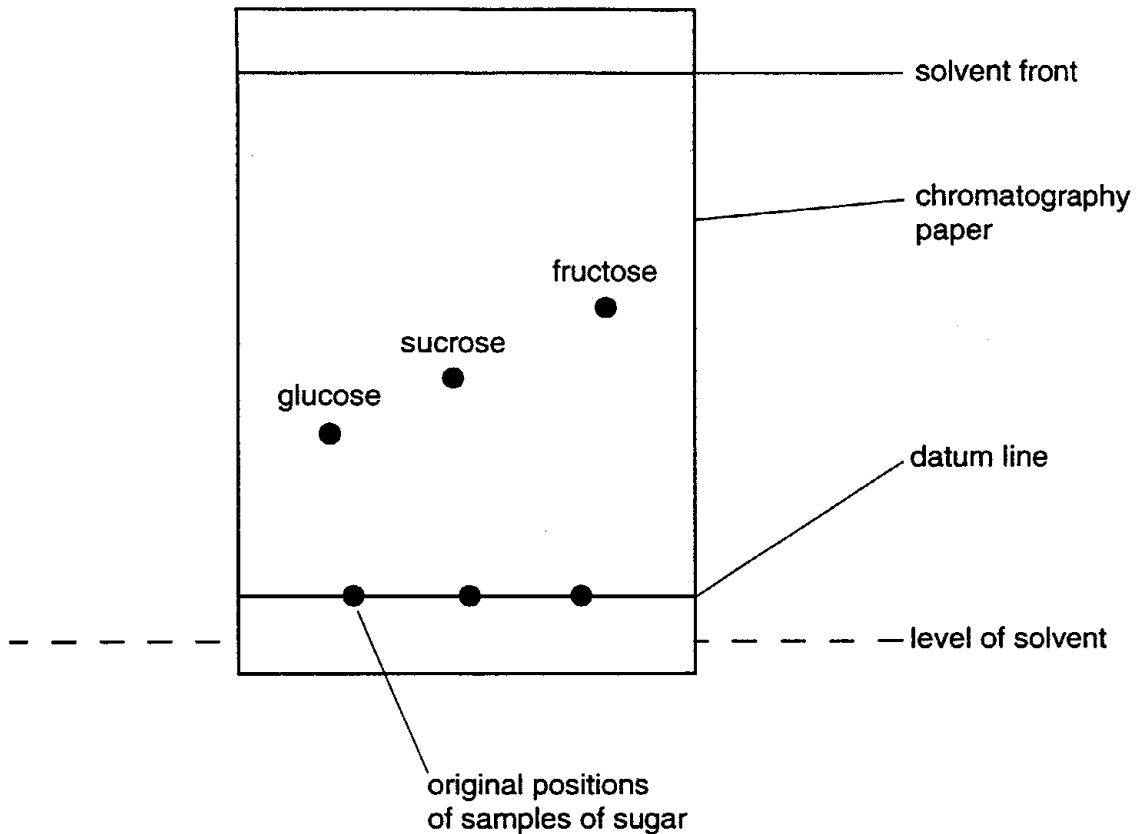
D .....[2]

(b) Outline how these pieces of equipment could be used in an investigation to compare the concentration of alkali in the two liquid oven cleaners.

.....  
.....  
.....  
.....  
.....  
.....[5]

**Extension 1**

(d) Chromatography is used to identify simple carbohydrates, such as sugars, in plant material.



**Fig. 5.2**

A leaf is ground with 50% aqueous alcohol to give a colourless solution of the sugars. This solution is concentrated and a chromatogram is obtained. The paper is sprayed with resorcinol solution.

(i) A common use of ethanol is in alcoholic drinks. In this experiment it is used as a solvent. Give one other use.

.....[1]

(ii) Why is the datum line drawn in pencil?

.....[1]

(iii) Suggest a reason why it is necessary to spray the chromatogram with resorcinol.

.....  
.....[2]

(iv) Describe how chromatography could be used to show that the hydrolysis of starch produces only one sugar, glucose.

.....  
.....[2]

## Answers

### Core 1

- a(i) (Liebig) condenser
- (ii) 99
- (iii) limonene floats on water / on top of the water

## Alternative to Practical 1

- a      **C** = burette  
         **D** = pipette
- b      five points from these  
         known volume of / pipette oven cleaner into flask / beaker  
         named acid  
         in burette  
         use of indicator  
         note volume of acid to neutralise oven cleaner  
         repeat with other oven cleaner

## Extension 1

- i fuel or making esters or antiseptic or ethanoic acid or vinegar or thermometers
- ii does not dissolve or does not contain dyes
- iii two of these
  - to develop it or locating agent
  - samples are colourless
  - to make them visible
- iv any two of these
  - only one spot
  - same position or Rf value
  - compare with glucose