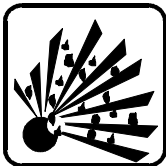


1. (a) Many chemicals are dangerous if not used carefully. Read the **two** hazard descriptions. Look at the hazard labels. Draw a line from each description to the correct label.

hazard labels

POISONOUS


This will cause damage if swallowed



P

CORROSIVE


This can attack or dissolve many things



Q

CORROSIVE


This can attack or dissolve many things



R

CORROSIVE


This can attack or dissolve many things



S

CORROSIVE

This can attack or dissolve many things



T

2 marks

- (b) The label on a bottle of kitchen cleaner says:

It leaves kitchen and bathroom surfaces bright and shiny.

Another part of the label says:

Contains sulphamic acid

Irritating to eyes and skin

Keep out of reach of children

- (i) The chart shows the colour of universal indicator in different solutions.

type of solution	strongly acidic	weakly acidic	neutral	weakly alkaline	strongly alkaline
colour of universal indicator	red	orange	green	blue	purple

What colour will the kitchen cleaner turn universal indicator?

.....

1 mark

- (ii) Which hazard label do you expect to see on the bottle?
Write the correct letter from the list above.

.....

1 mark
Maximum 4 marks

2. Dilute acids react with many things. Tick the **four** boxes by the correct descriptions. Tick no more than **four** boxes.

Acids always dissolve glass.

Acids can be burned as fuels.

Acids damage teeth.

Acids react with metals such as magnesium.

Acids turn universal indicator solution blue.

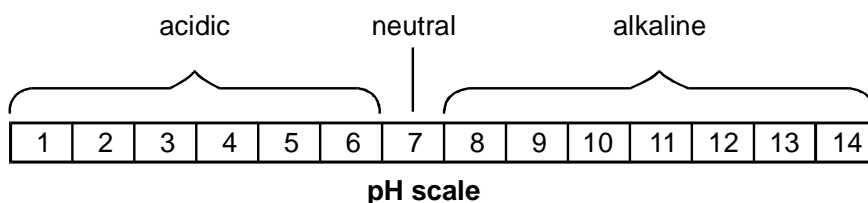
Acids may harm your skin.

Acids react with limestone.

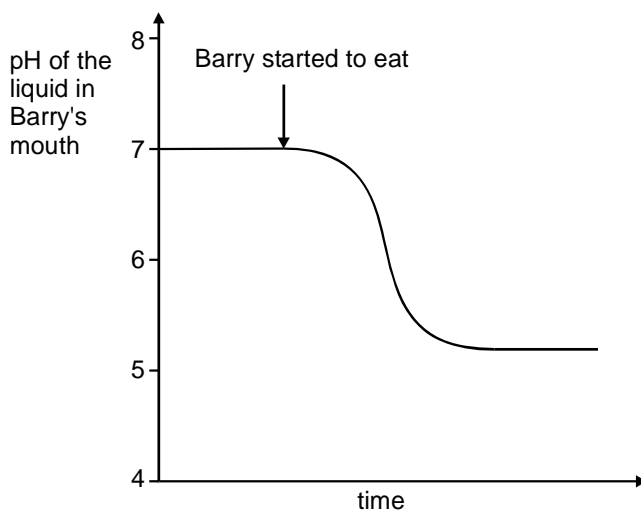
Acids are always poisonous.

4 marks

3. The pH scale shown below is used to measure how acidic or alkaline a solution is.



The graph below shows how the pH of the liquid in Barry's mouth changed as he ate a meal.



- (a) (i) Use the **graph** to give the pH of the liquid in Barry's mouth before he started to eat.

pH

1 mark

- (ii) What does this pH tell you about the liquid in Barry's mouth before he started to eat?
Use the **pH scale** above to help you.
Tick the correct box.

It was acidic. It was alkaline. It was colourless. It was neutral.

1 mark

- (b) Look at the **graph** above.
What happened to the pH of the liquid in Barry's mouth as he ate the meal?

.....

1 mark

- (c) Barry chews special chewing gum after each meal. The chewing gum neutralises the liquid in his mouth.

What type of substance neutralises an acid? Tick the correct box.

an acid an alkali
an indicator a solid

1 mark
Maximum 4 marks

4. Water from red cabbage can be used to find out if a liquid is acidic, alkaline or neutral.

Type of liquid added to the cabbage water	colour of the cabbage water
acidic	red
alkaline	blue
neutral	purple

John added three different liquids to the cabbage water.

- (a) Use the information above to complete the table below.

Liquid added to the cabbage water	colour of the cabbage water	Is the liquid acidic, alkaline or neutral?
water	purple	
lemon juice		acidic
washing up liquid	blue	

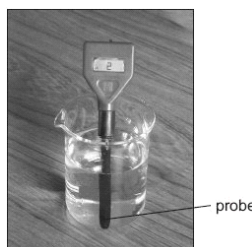
3 marks

- (b) What word describes chemicals which change colour in acids or alkalis?
Tick the correct box.

filters indicators
liquids solids

1 mark
Maximum 4 marks

5. Molly used a pH sensor to test different liquids. She dipped the probe of the sensor into each liquid and recorded the pH value in a table.



- (a) In the table below, tick **one** box for each liquid to show whether it is **acidic**, **neutral** or **alkaline**. One has been done for you.

liquid	pH value	acidic	neutral	alkaline
alcohol	7			
dilute hydrochloric acid	2	✓		
distilled water	7			
vinegar	3			
sodium hydroxide solution	11			

2 marks

- (b) Between each test Molly dipped the probe into distilled water.

(i) Why did she do this?

.....

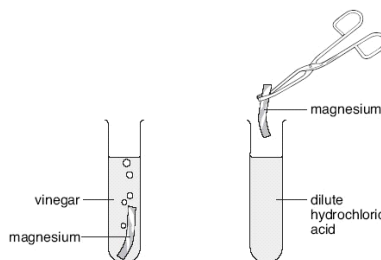
1 mark

(ii) Which other liquid in the table could Molly use between tests to have the same effect as distilled water?

.....

1 mark

- (c) Molly put a piece of magnesium into a test-tube containing 20 cm³ of vinegar. She put another piece of magnesium into a test-tube containing 20 cm³ of dilute hydrochloric acid.



(i) Molly thought that magnesium would react more vigorously with hydrochloric acid than with vinegar.

What information in the table made Molly think this?

.....

1 mark

(ii) How would Molly be able to tell if a more vigorous reaction took place with hydrochloric acid than with vinegar?

.....

1 mark

- (d) (i) Complete the word equation for the reaction between magnesium and hydrochloric acid.

magnesium + hydrochloric acid → +

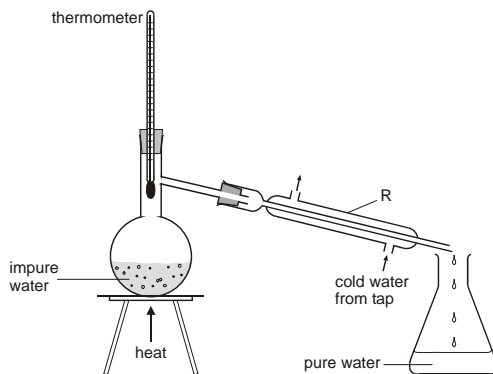
2 marks

(ii) After some time this reaction stopped. Why did the reaction stop?

.....

1 mark
 maximum 9 marks

6. (a) The apparatus in the diagram below is used to obtain pure water from impure water.



(i) What temperature would the thermometer show?

..... °C

1 mark

(ii) What is the function of the piece of apparatus labelled R?

.....

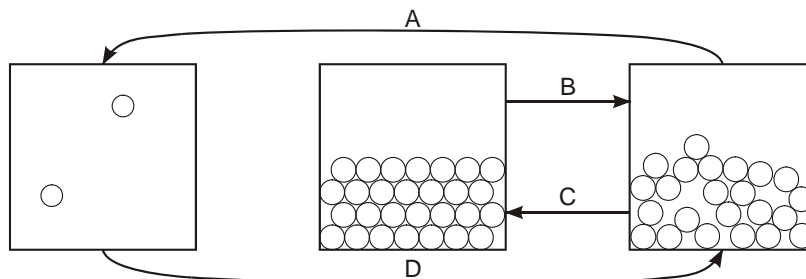
1 mark

(iii) Give the name of the process which purifies water in this way.

.....

1 mark

(b) The diagram below shows particles in a gas, a solid and a liquid. Each arrow, A, B, C and D, represents a change of state.



(i) Choose from the following words to complete the sentences below.

- boiling** **condensing** **distilling** **evaporating**
filtering **freezing** **melting**

Change of state A is called

Change of state B is called

Change of state C is called

Change of state D is called

4 marks

(ii) Look back to the apparatus in part (a).

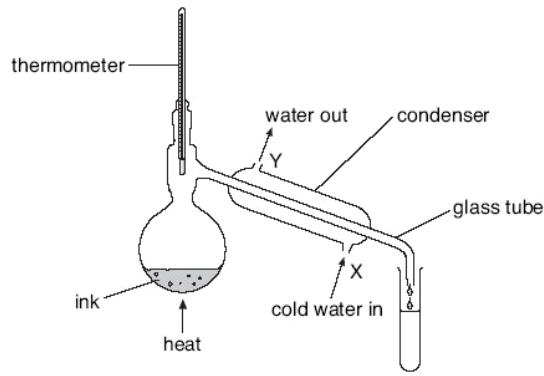
Give the letter, A, B, C or D, from the diagram above, for the change of state which occurs:

in the round-bottomed flask

in the piece of apparatus labelled R.

2 marks
 Maximum 9 marks

7. Rema used the apparatus below to distil 100 cm³ of water-soluble ink.



apparatus A

not to scale

(a) Which processes occur during distillation? Tick the correct box.

- condensation then evaporation
- evaporation then condensation
- melting then boiling
- melting then evaporation

(b) Give the name of the colourless liquid that collects in the test-tube.

.....

(c) What would the temperature reading be on the thermometer when the ink has been boiling for two minutes?

..... °C

(d) (i) Water at 15°C enters the condenser at X. Predict the temperature of the water when it leaves the condenser at Y.

..... °C

Explain this change of temperature.

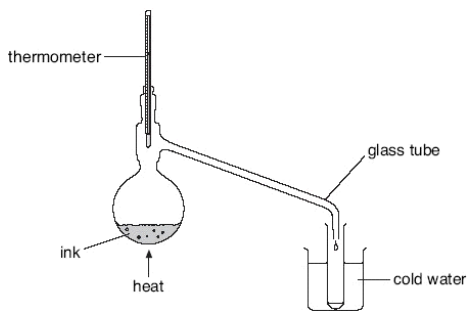
.....

(ii) Give **two** ways in which the water vapour changes as it passes down the glass tube in the condenser.

1.

2.

(e) Peter used the apparatus below to distil 100 cm³ of water-soluble ink.



apparatus B

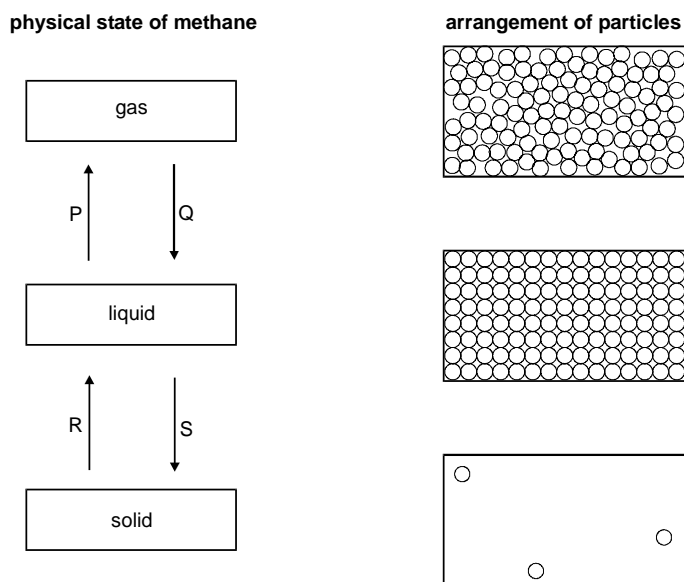
Why is the condenser in **apparatus A** better than the glass tube and beaker of water in **apparatus B**?

.....

1 mark
 maximum 7 marks

8. (a) Methane can be a gas, a liquid or a solid. In the diagram below, arrows P, Q, R and S represent changes of state.

The boxes on the right show the arrangement of particles of methane in the three different physical states. Each circle represents a particle of methane.



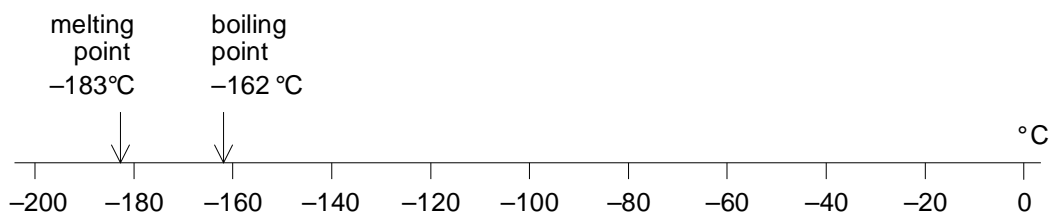
- (i) Draw a line from each physical state of methane to the arrangement of particles in that physical state.
 Draw only **three** lines.

1 mark

- (ii) Arrows P, Q, R and S represent changes of state. Which arrow represents:
 evaporation?melting?.....

2 marks

- (b) Methane is the main compound in natural gas. The scale below shows the melting point and the boiling point of methane.



Methane has three physical states: solid, liquid and gas.

- (i) What is the physical state of methane at -170°C ?

-
- (ii) The formula of methane is CH_4 . The symbols for the two elements in methane are C and H. Give the names of these two elements.

1 mark

element C

element H

2 marks

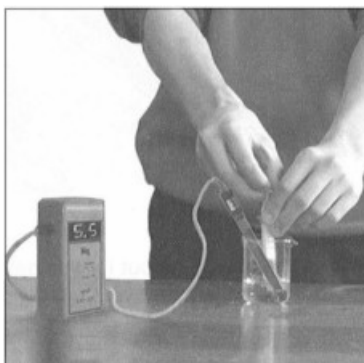
- (iii) When methane burns, it reacts with oxygen. One of the products is water, H_2O . Give the name of the other product.

.....

1 mark

Maximum 7 marks

9. A pupil used a sensor to record the change in pH of 10 cm^3 of an acid solution when an alkali solution was added a little at a time. The concentrations of the alkali and acid solutions were fixed.



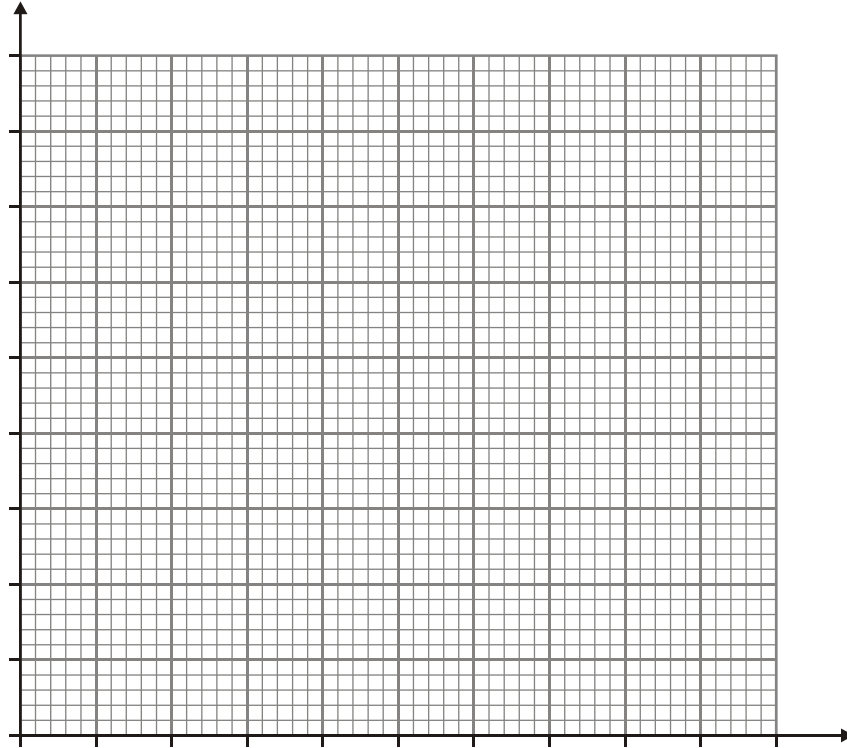
His results are shown in the table below.

volume of alkali added (cm^3)	pH of resulting mixture
0.0	5.0
2.0	5.0
4.0	5.0
6.0	5.5
8.0	6.0
10.0	7.0
12.0	8.0
14.0	8.5
16.0	9.0
18.0	9.0
20.0	9.0

- (a) Use his results to draw a graph on the grid below.

- Label the axes.

- Plot the points.
- Draw a smooth curve.



4 marks

(b) Look at the graph.

What would be the likely pH of the solution if the pupil added a further 2 cm³ of alkali solution?

.....

1 mark

maximum 5 marks