## ACIDS, BASES AND INDICATORS

1. 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** | **colour of the cabbage water** | **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

**2.** Table 1 below shows ***the colour of universal indicator in acidic, neutral and*** alkaline solutions.

| | **acidic** ← | | | **neutral** | **alkaline** → | | |
|---|---|---|---|---|---|---|---|
| **colour** | red | orange | yellow | green | blue | dark blue | purple |

**table 1**

Ramy tested different liquids with the indicator solution.
His results are shown in table 2 below.

| **liquid** | **colour of indicator solution** |
|---|---|
| Milk | green |
| lemonade | orange |
| water | green |
| fruit juice | red |
| washing-up liquid | blue |

**table 2**

(a) Use Ramy's results to answer the following questions.

(i) Give the name of **one** acidic liquid in **table 2**.

.....

1 mark

(ii) Give the name of **one** neutral liquid in **table 2**.

.....

1 mark

(b) Ramy dissolved some bicarbonate of soda in distilled water.
This produced an alkaline solution.

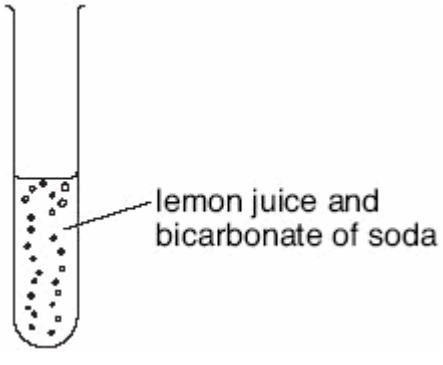
(i) Ramy added the indicator to the alkaline solution.

Suggest what colour the indicator became.
Use **table 1** to help you.

.....

1 mark

(ii) Ramy added lemon juice to the solution of bicarbonate of soda.




How could he tell that a gas was produced?

.....

1 mark

(c) Ramy mixed an acid with an alkali and tested the mixture with the indicator solution.
The indicator solution turned green.

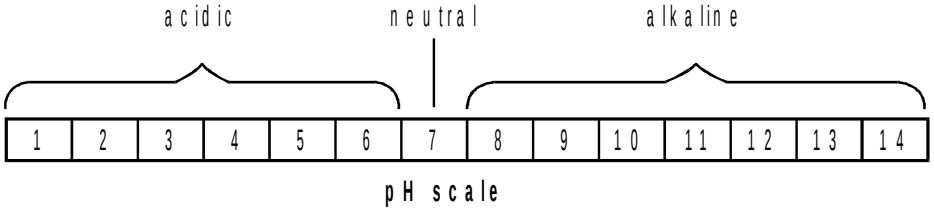
What is the name of the reaction between an acid and an alkali?
Tick the correct box.

| | |
|---|---|
| condensation | ☐ |
| crystallisation | ☐ |
| evaporation | ☐ |
| neutralisation | ☐ |

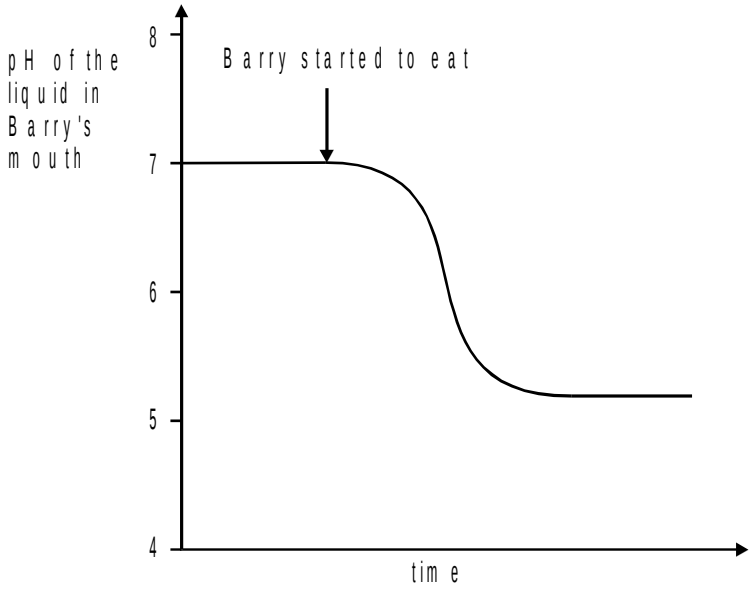
1 mark

maximum 5 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.** The teacher gave two students a set of three colourless solutions, labelled X, Y and Z.

He also gave them solution P which is an indicator. Solution P is colourless in an acidic solution but pink in an alkaline solution.

The students added solution P to samples of the solutions X, Y and Z.
The figure below shows the results.

| solution X | solution Y | solution Z |
|---|---|---|
| colourless | pink | pink |

(a) Decide whether solutions X, Y and Z are acidic or alkaline.

solution X .....

solution Y .....

solution Z ..... [2]

(b) The students wanted to deduce the name of the acid. They carried out a test that showed that the acid contained sulphate ions.

(i) Name the reagent that they added to the acid.

.....
[1]

(ii) Describe what they observed when this reagent was added to the acid.

.....
..... [1]

(iii) Name the acid.

.....
[1]

(c) The students placed about 1 cm3 of solution Y in a test-tube and added one drop of solution P.

Then they added solution X, a few drops at a time. After a few drops had been added there was no change in colour, but when more drops of solution X had been added, the colour changed.

(i) There was no change in colour when the first few drops of solution X had been added. Why was this?

.....

.....
[1]

(ii) Suggest how the colour changed when more drops of solution X were added.

The colour changed from .....

to..... [1]

(iii) What kind of reaction took place between solution X and solution Y?

.....
[1]

**[Total 8m]**