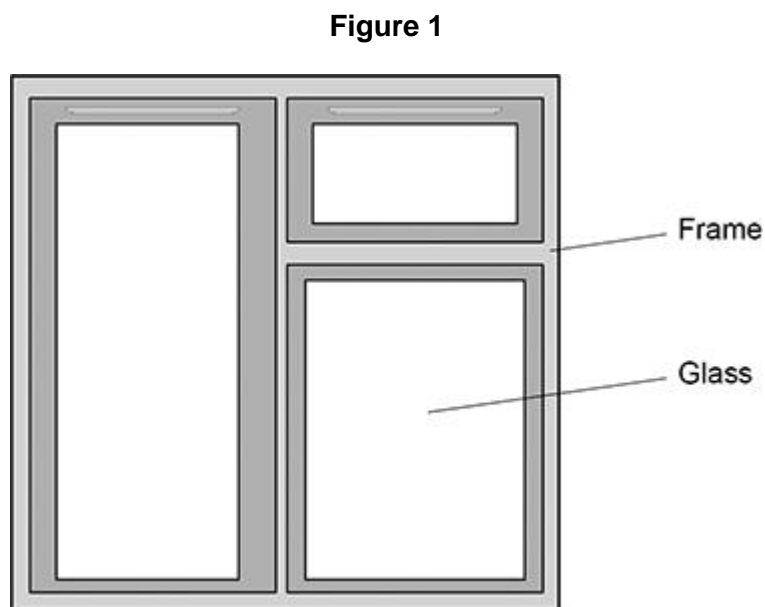


C15 Using Our Resources Homework task 1

Q1.

This question is about substances used to make windows and window frames.

Figure 1 shows a window.



- (a) Glass is made by heating sand with **two** other materials.

Which **two** other materials are used to make glass?

Tick (✓) **two** boxes.

Clay

Graphite

Limestone

Sodium carbonate

Sodium hydroxide

(2)

Window frames need to be:

- easy to install
- resistant to damage.

The polymers poly(chloroethene) and HDPE are used to make window frames.

Table 1 shows information about poly(chloroethene) and HDPE.

Table 1

| Property | Poly(chloroethene) | HDPE |
|------------------------------|--------------------|------|
| Density in g/cm ³ | 1.4 | 0.92 |
| Relative strength | 72 | 25 |

- (b) Suggest **one** advantage of using poly(chloroethene) compared with HDPE to make window frames.

Give **one** reason for your answer.

Use **Table 1**.

Advantage _____

Reason _____

(2)

- (c) Suggest **one** advantage of using HDPE compared with poly(chloroethene) to make window frames.

Give **one** reason for your answer.

Use **Table 1**.

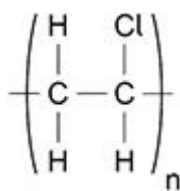
Advantage _____

Reason _____

(2)

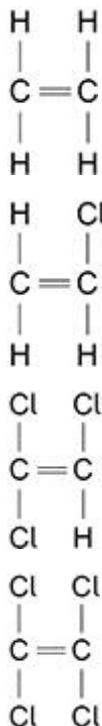
(d) **Figure 2** shows the displayed structural formula of poly(chloroethene).

Figure 2



Which monomer is used to make poly(chloroethene)?

Tick (✓) **one** box.



(1)

(e) Chlorine gas is used to produce poly(chloroethene).

Describe a test to identify chlorine gas.

Give the result of the test.

Test _____

Result _____

(2)

(f) Wood can be used instead of polymers to make window frames.

- Polymers are unreactive.

- Polymers are produced from crude oil.
- Wood breaks down in wet conditions.
- Wood is produced from trees.

Suggest **one** advantage of using polymers and **one** advantage of using wood to make window frames.

Advantage of polymers _____

Advantage of wood _____

(2)

Window frames can also be made from an alloy of aluminium.

(g) 6.00 kg of the alloy is used to make a window frame.

Table 2 shows the mass of each element in 6.00 kg of the alloy.

Table 2

| Element | Mass in kg |
|-----------|------------|
| Aluminium | 5.94 |
| Magnesium | 0.04 |
| Silicon | 0.02 |

Calculate the percentage of aluminium in 6.00 kg of the alloy.

Percentage of aluminium = _____ %

(2)

(h) Why is an alloy used instead of pure aluminium to make window frames?

(1)

(Total 14 marks)

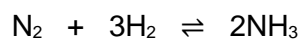
HIGHER TIER QUESTIONS

Q2.

This question is about ammonia and fertilisers.

- (a) Ammonia is produced by a reversible reaction.

The equation for the reaction is:



Complete the sentence.

The forward reaction is exothermic, so the reverse reaction

is _____

(1)

- (b) Calculate the percentage by mass of nitrogen in ammonia (NH_3).

Relative atomic masses (A_r): H = 1; N = 14

You **must** show how you work out your answer.

Percentage by mass of nitrogen = _____ %

(3)

- (c) A neutral solution can be produced when ammonia reacts with an acid.

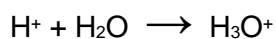
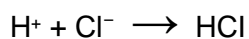
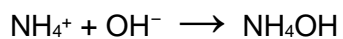
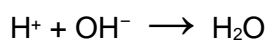
- (i) Give the pH of a neutral solution.

pH _____

(1)

- (ii) Which of these ionic equations shows a neutralisation reaction?

Tick (✓) **one** box.



(1)

- (iii) Name the salt produced when ammonia reacts with hydrochloric acid.

(1)

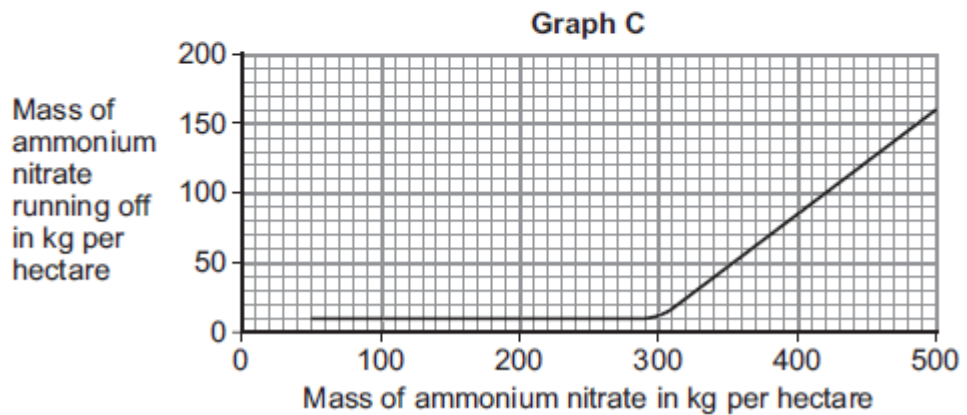
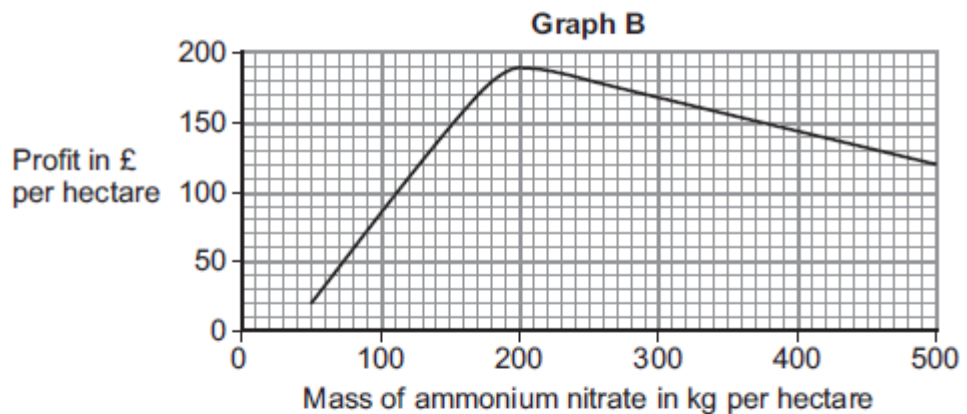
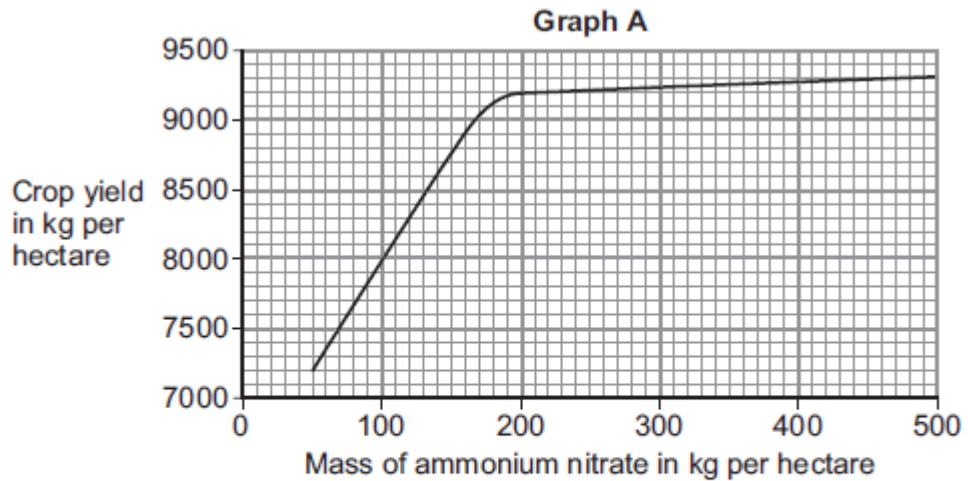
- (d) In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Farmers use ammonium nitrate as a fertiliser for crops.

Rainwater dissolves ammonium nitrate in the soil.

Some of the dissolved ammonium nitrate runs off into rivers and lakes.

The graphs **A**, **B** and **C** below show information about the use of ammonium nitrate as a fertiliser. A hectare is a measurement of an area of land.



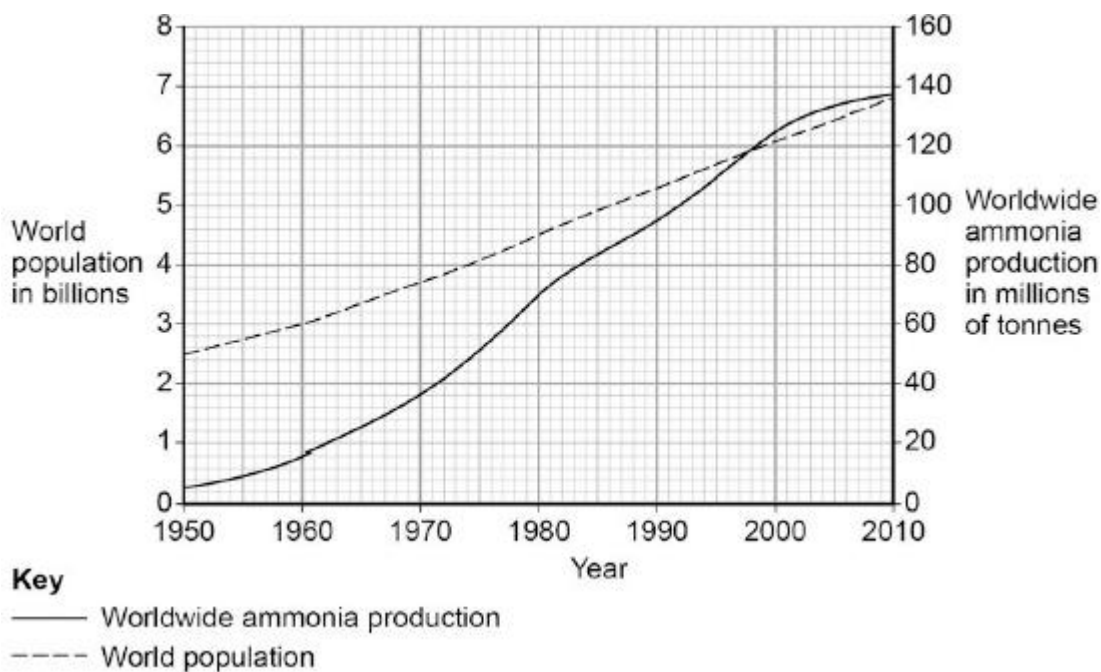
(b) A fertiliser contains the following information on the label:

NPK value = 14 : 11 : 11

Explain why this information is useful to farmers.

(2)

(c) The figure below shows worldwide ammonia production and world population from 1950 to 2010.



Use the figure above and your knowledge to explain the relationship between ammonia production and world population.

(3)

(Total 6 marks)