

(NPK fertilisers (industrial production, comparison with natural sources))

Q1.(2019)

Most of the ammonia produced is used to make fertilisers.

Why did the world production of ammonia change between 1950 and 2010?

[2 marks]

Tick (✓) **two** boxes.

The demand for food changed.

☐

The demand for fuels changed.

☐

The nitrogen percentage in air changed.

☐

The number of cars changed.

☐

The world population changed.

☐

Q2.a)(2019)

Table 1 shows data about four fertilisers, **A**, **B**, **C** and **D**.

Table 1

Fertiliser	Percentage by mass of nitrogen (%)	Percentage by mass of phosphorus (%)	Percentage by mass of potassium (%)
A	35.0	0.0	0.0
B	21.2	0.0	0.0
C	21.2	23.5	0.0
D	0.0	0.0	52.3

Which combination of fertilisers **A**, **B**, **C** and **D** provides **all** of the elements needed for an NPK fertiliser?

Use Table 1.

[1 mark]

Tick (✓) **one** box.

A and **C**

☐

A and **D**

☐

B and **C**

☐

C and **D**

☐

Q2.b)(2019)

Which fertiliser is **not** made using ammonia?

Use **Table 1**.

[1 mark]

Tick (✓) **one** box.

A

☐

B

☐

C

☐

D

☐

Q3.a)(2020)

Ammonia is used to produce fertilisers.

NPK fertilisers contain the elements nitrogen, phosphorus and potassium.

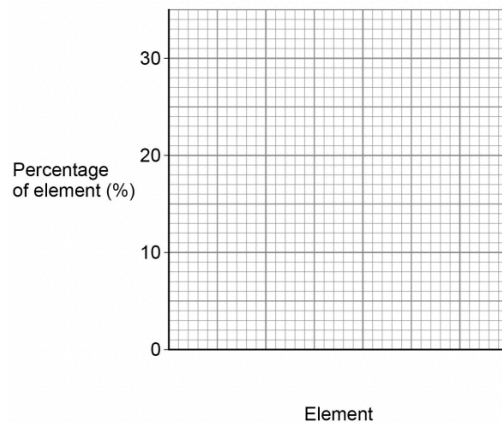
A fertiliser contains:

- 22% phosphorus
- 25% potassium.

Draw a bar chart on **Figure 2** to show the percentages of phosphorus and of potassium in this fertiliser.

[2 marks]

Figure 2



Q3.b)(2020)

Why do the percentages of phosphorus and of potassium in this fertiliser **not** add up to 100%?

[1 mark]

Q4.a)(2020)

Fertilisers help plants grow by adding essential elements to soil.

Table 1 shows the percentages of nitrogen, phosphorus and potassium in four fertilisers, **A, B, C** and **D**.

Table 1

Fertiliser	Percentage (%) of essential element		
	Nitrogen (N)	Phosphorus (P)	Potassium (K)
A	14	0	39
B	25	16	23
C	21	23	0
D	21	0	0

Plants lacking essential elements do not grow well because:

- too little phosphorus can cause slow plant growth
- too little potassium can cause leaves to have brown edges.

Which fertiliser helps prevent slow plant growth **and** brown leaf edges?

Use **Table 1**.

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

Q4.b)(2020)

Which fertiliser has the greatest total percentage of essential elements?

Use **Table 1**.

[1 mark]

Tick (✓) **one** box.

A ☐ **B** ☐ **C** ☐ **D** ☐

Q5.(2022)

This question is about fertilisers.

Ammonium nitrate is a fertiliser containing nitrogen.

Complete the sentence.

Choose the answer from the box.

[1 mark]

hydrochloric acid

nitric acid

sulfuric acid

Ammonium nitrate is produced by reacting ammonia with

_____.

Q6.(2022)

Ammonium nitrate fertiliser is sold in 600 kg bags.

A farmer spreads 40 bags of ammonium nitrate fertiliser on land with an area of 800 000 m².

Calculate the mass of ammonium nitrate fertiliser spread per m² of land.

[2 marks]

Mass per m² = _____ kg/m²

Q7.(2022)

A scientist works for a company which makes ammonium nitrate fertiliser.

The scientist investigates the effect of different fertilisers on crop growth.

The scientist concludes that the ammonium nitrate fertiliser improves crop growth more than other fertilisers.

Suggest **one** reason why this conclusion might **not** be valid.

[1 mark]

Q8.(2022)

A different fertiliser containing nitrogen has the formula K₂NH₄PO₄

How many atoms of nitrogen are in the formula K₂NH₄PO₄?

[1 mark]

Q9.(2022)

Nitrogen and potassium in the fertiliser $K_2NH_4PO_4$ are important for good crop growth.

Which other element in the fertiliser $K_2NH_4PO_4$ is important for good crop growth?

[1 mark]

Tick (✓) **one** box.

Hydrogen

☐

Oxygen

☐

Phosphorus

☐

Q10.(2022)

Some fertilisers are mixtures of different compounds in fixed proportions.

What name is given to a mixture of different compounds in fixed proportions?

[1 mark]

Q11.(2024)

Ammonia and nitric acid react to produce the salt, ammonium nitrate.

Ammonium ions and nitrate ions both contain nitrogen.

Suggest **one** use of ammonium nitrate.

[1 mark]
