

1. Nov/2022/Paper_11/No.30

Which reaction produces ammonia gas?

- A warming ammonium chloride with dilute sodium hydroxide
- B warming ammonium nitrate with dilute sulfuric acid
- C warming ammonium phosphate with dilute sodium chloride
- D warming ammonium sulfate with dilute nitric acid

2. Nov/2022/Paper_12/No.30

Ammonium nitrate, NH_4NO_3 , is a fertiliser and is added to fields to help crops grow.

Slaked lime, $\text{Ca}(\text{OH})_2$, is an alkali and is added to fields to reduce the acidity of the soil.

Ammonium nitrate and slaked lime should not be added to a field at the same time because they react with each other to form a gas, Z.

What is Z?

- A ammonia
- B hydrogen
- C nitrogen
- D oxygen

3. Nov/2022/Paper_21/No.30

Which row explains why a high temperature and an iron catalyst are used in the manufacture of ammonia by the Haber process?

	high temperature	iron catalyst
A	increases the rate of the reaction	increases the equilibrium yield of ammonia
B	increases the rate of the reaction	increases the rate of the reaction
C	increases the equilibrium yield of ammonia	increases the equilibrium yield of ammonia
D	increases the equilibrium yield of ammonia	increases the rate of the reaction

4. Nov/2022/Paper_22/No.30

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Slaked lime, $\text{Ca}(\text{OH})_2$, is an alkali and is added to fields to reduce the acidity of the soil.

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What is Z?

- A ammonia
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5. Nov/2022/Paper_23/No.27

Which statement about the manufacture of ammonia is correct?

- A Ammonia is manufactured by heating hydrogen and nitrogen at 50°C and 1.0 atm.
- B Ammonia is obtained by heating hydrogen and nitrogen in the Contact process.
- C Hydrogen for the manufacture of ammonia is extracted from air.
- D The reaction between hydrogen and nitrogen to form ammonia is reversible.

6. Nov/2022/Paper_23/No.30

Petrol-fuelled cars produce oxides of nitrogen.

Which statement explains how oxides of nitrogen are formed?

- A In the catalytic converter, the elements nitrogen and oxygen combine.
- B Oxygen and nitrogen compounds in petrol combine in the car engine.
- C The high temperatures in the engine provide oxygen and nitrogen with the activation energy needed to react.
- D In the car engine, nitrogen compounds in petrol combine with oxygen.

This question is about compounds of nitrogen.

(a) Fertilisers containing nitrogen are used by farmers to improve crop growth.

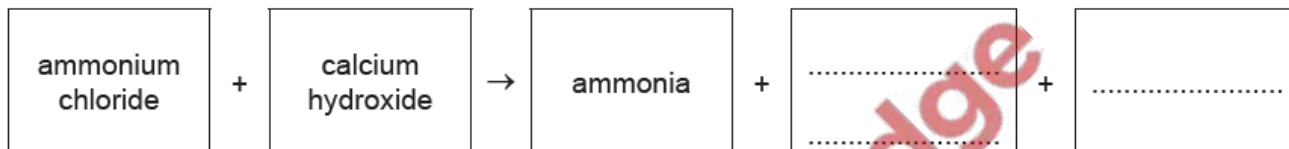
Name two **other** elements found in most fertilisers that improve crop growth.

..... and [2]

(b) Ammonium chloride, NH_4Cl , reacts with calcium hydroxide.

The products are ammonia, a salt and a liquid that turns anhydrous copper(II) sulfate blue.

Complete the word equation for this reaction.



[2]

(c) Describe a test for chloride ions.

test

observations

[2]

(d) Bacteria in the soil can convert ammonium ions into oxides of nitrogen.

(i) Give one **other** source of oxides of nitrogen in the air.

..... [1]

(ii) State one adverse effect of oxides of nitrogen on health.

..... [1]

[Total: 8]

This question is about compounds of nitrogen and fertilisers.

- (a) Ammonium chloride is heated with sodium hydroxide.

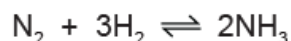


Choose from the list the word that describes this reaction.

Draw a circle around your answer.

addition displacement oxidation reduction [1]

- (b) Ammonia is manufactured from nitrogen and hydrogen.



- (i) Give the meaning of the symbol \rightleftharpoons .

..... [1]

- (ii) The nitrogen for this process is obtained from the air.

State the percentage of nitrogen in clean, dry air.

..... [1]

- (c) Fertilisers contain nitrogen.

Name two **other** elements found in most fertilisers that are essential for plant growth.

..... and [2]

- (d) Bacteria in the soil can convert ammonium ions into oxides of nitrogen.

Oxides of nitrogen contribute to acid rain.

- (i) Name one **other** pollutant in the air that contributes to acid rain.

..... [1]

- (ii) State **one** adverse effect of acid rain on buildings.

..... [1]

[Total: 7]