Nitrogen and Compounds – 2022 Nov IGCSE Chemistry 0620

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, $Ca(OH)_2$, 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

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

Slaked lime, $Ca(OH)_2$, 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

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.

7. Nov/2022/Paper_31/No.5

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.

ammonium chloride	+	calcium hydroxide	→	ammonia	+	....	+	.....

[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]

8. Nov/2022/Paper_33/No.5

This question is about compounds of nitrogen and fertilisers.

(a) Ammonium chloride is heated with sodium hydroxide.

$$NH_4Cl + NaOH \rightarrow NH_3 + NaCl + H_2O$$

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.

$$N_2 + 3H_2 \rightleftharpoons 2NH_3$$

(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]