PEARSON EDEXCEL GCSE COMBINED SCIENCE (HIGHER) · 1SC0

CHEMISTRY



EXAM QUESTION PACK

TOPIC 6: GROUPS IN THE PERIODIC TABLE: GROUP 0 (PAPER 2)

SCORE	PERCENTAGE
/39	%

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Q1.

This question is about gases.

A diagram of an atom of helium is shown in Figure 3.

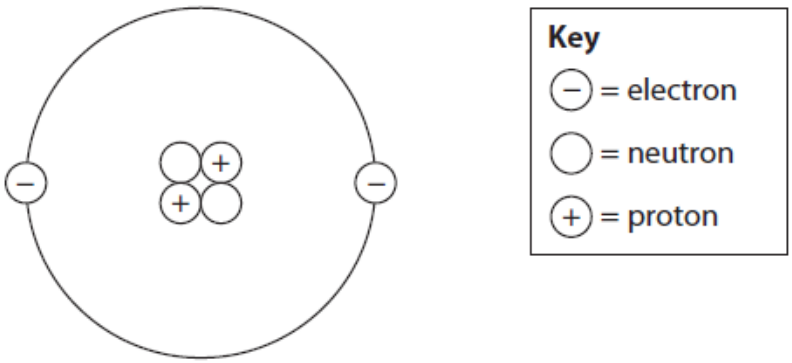


Figure 3

(i) Explain, using Figure 3, why helium is inert.

(2)

.....

.....

.....

(ii) Helium is used to fill balloons.

State one property of helium, apart from it being inert, that makes it suitable for filling balloons.

(1)

.....

(Total for question = 3 marks)

(**QU02d 1SC0/2CH, June 2022**)

Q2.

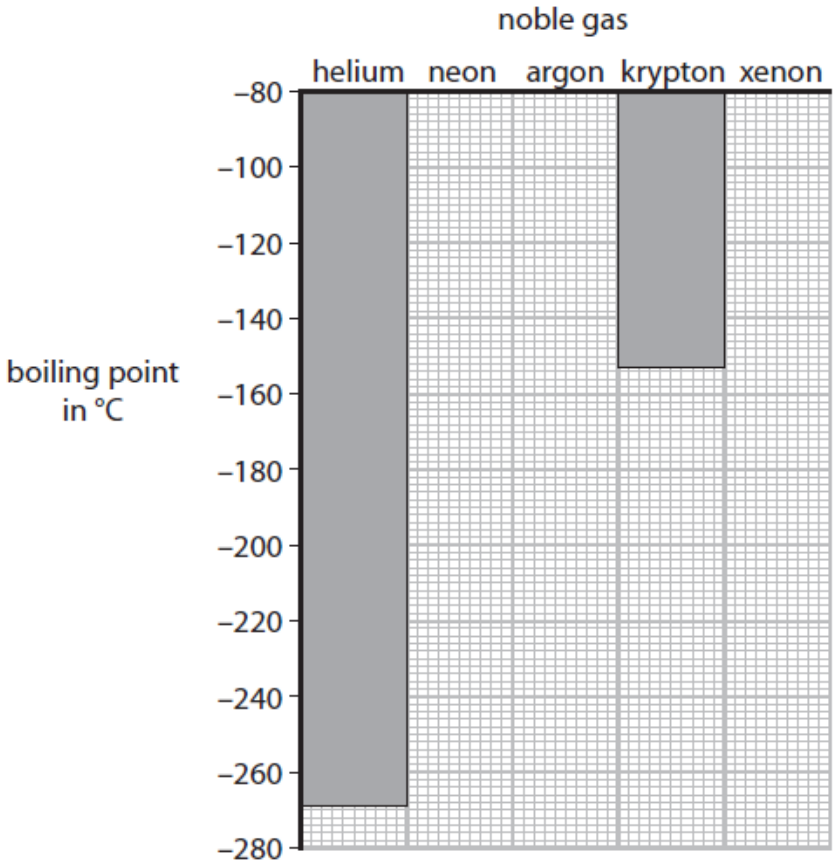
Figure 3 shows the boiling points of some of the noble gases.

noble gas	boiling point in °C
helium	–269
neon	–246
argon	–186
krypton	–153
xenon	

Figure 3

(i) Complete the bar chart to show the boiling points of neon and argon.

(2)



(ii) Predict the boiling point of xenon.

(1)

boiling point of xenon = ... °C

(Total for question = 3 marks)

(**Q02c 1SC0/2CF, Nov 2021**)

Q3.

Elements in the periodic table

(a) Copper is a metal.

(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

In the periodic table copper is in

(1)

☐ **A** group 0

☐ **B** group 1

☐ **C** group 7

☐ **D** the transition metals

(ii) Which of these is a property of copper metal?

Put a cross (☒) in the box next to your answer.

(1)

☐ **A** does not conduct an electric current

☐ **B** forms colourless compounds

☐ **C** has a low melting point

☐ **D** is malleable

(b) Helium and argon are noble gases.

(i) Choose the correct word from this box to complete the sentence below.

non- flammable	odourless	reactive

(1)

Argon can be used to put out fires because it is .....

(ii) Choose the correct phrase from this box to complete the sentence below.

has a high density	has a low density	is colourless



(1)

Helium is used in airships because it .....

(c) Chlorine, bromine and iodine are halogens.

(i) The table shows the appearance of bromine and iodine at room temperature.

Complete the table to show the appearance of chlorine at room temperature.

(2)

halogen	appearance at room temperature
chlorine	
bromine	dark red liquid
iodine	grey solid

(ii) Chlorine reacts with hydrogen to form hydrogen chloride.

Write the word equation for this reaction.

(2)

..... + ... → .....

(Total for question = 8 marks)

(**Q01 1SC0/2CF, June 2014**)

Q4.

For many years, argon was used to fill filament light bulbs.

A filament light bulb is shown in Figure 4.

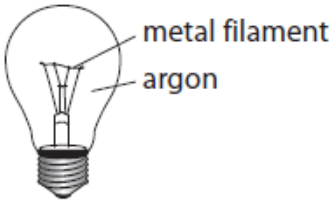


Figure 4

When the bulb is in use the metal filament becomes extremely hot.

Explain why argon, rather than air, was used to fill filament light bulbs.

(2)

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.....

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.....

.....

.....

(Total for question = 2 marks)

(**Q02e 1SC0/2CF, June 2019**)

Q5.

A diagram of an atom of helium is shown in Figure 9.

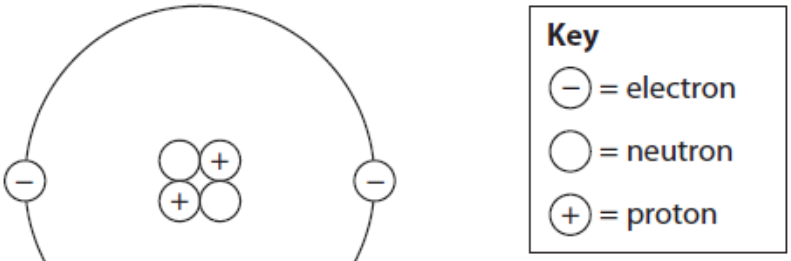


Figure 9

(i) Explain, using Figure 9, why helium is inert.

(2)

.....

.....

.....

(ii) Helium is used to fill balloons.

State one property of helium, apart from it being inert, that makes it suitable for filling balloons.

(1)

.....

(Total for question = 3 marks)

(**QU06d 1SC0/2CF, June 2019**)

Q6.

A diagram of an atom of helium is shown in Figure 9.

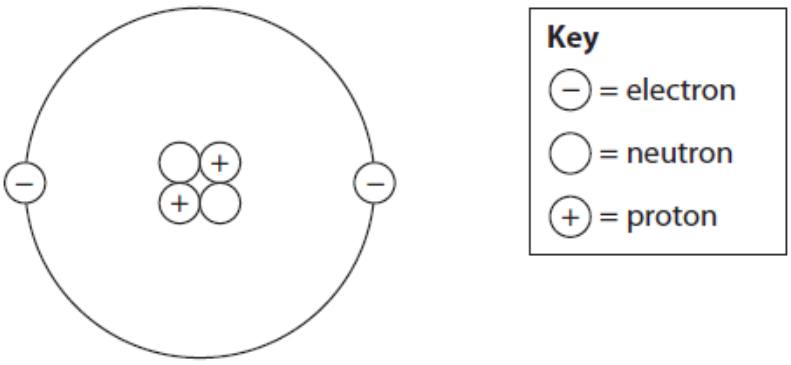


Figure 9

(i) Explain, using Figure 9, why helium is inert.

(2)

.....

.....

.....

(ii) Helium is used to fill balloons.

State one property of helium, apart from it being inert, that makes it suitable for filling balloons.

(1)

.....

(Total for question = 3 marks)

(**QU06d 1SC0/2CF, June 2022**)

Q7.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

This question is about the atmosphere.

Helium, neon and argon are all inert.

(i) Explain, in terms of electrons, why these gases are inert.

(2)

.....

.....

.....

(ii) Two pieces of steel can be joined by heating the metal pieces with a very hot flame.

This process is often carried out in an argon atmosphere rather than in air.

Which property makes argon gas suitable for this use?

(1)

☒ **A** argon has a low density

☒ **B** argon has a low melting point

☒ **C** argon is colourless

☒ **D** argon is unreactive

(Total for question = 3 marks)

(**QU06c 1SC0/2CF, June 2024**)

Q8.

Answer the question with a cross in the box you think is correct ☒ . If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒ .

This question is about the atmosphere.

Helium, neon and argon are all inert.

(i) Explain, in terms of electrons, why these gases are inert.

(2)

.....

.....

.....

(ii) Two pieces of steel can be joined by heating the metal pieces with a very hot flame.

This process is often carried out in an argon atmosphere rather than in air.

Which property makes argon gas suitable for this use?

(1)

- ☒ **A** argon has a low density
- ☒ **B** argon has a low melting point
- ☒ **C** argon is colourless
- ☒ **D** argon is unreactive

(Total for question = 3 marks)

(**QU02c 1SC0/2CH, June 2024**)

Q9.

This question is about the noble gas xenon.

Xenon is unreactive.

Explain, in terms of its electronic configuration, why xenon is unreactive.

.....

.....

.....

.....

.....

.....

(Total for question = 2 marks)

(**QU04a 1SC0/2CH, June 2025**)

Q10.

The table shows some of the gases in group 0 and some of their properties.
The gases are shown in the order in which they appear in group 0.

(i) Fill in the three spaces in the table.

gas	atomic symbol	density / g dm^{-3}	reaction with metals
helium	He	0.12	no reaction
neon	Ne	1.44	no reaction
argon	Ar		no reaction
krypton		3.00	no reaction
xenon	Xe	3.56	

(ii) Some light bulbs contain a metal filament.



These light bulbs are filled with argon.

Explain why argon, instead of air, is used inside these light bulbs.

(2)

.....

.....

.....

.....

.....

(**Q09 1SC0/2CF, June 2013**)

Q11.

Four of the noble gases are argon, helium, krypton and neon.

Give these gases in order of increasing density.

(2)

.....

.....

(Total for question = 2 marks)

(**Q04c 1SC0/2CH, Nov 2020**)

Q12.

The periodic table is very useful to chemists.

(a) Complete the sentence by putting a cross (☒) in the box next to your answer.

The periodic table is a table of

(1)

☒ **A** mixtures

☒ **B** elements

☒ **C** compounds

☒ **D** solutions

(b) Complete the sentence by putting a cross (☒) in the box next to your answer.

Group 1 in the periodic table contains

(1)

☒ **A** transition metals

☒

B noble gases

☒ **C** halogens

☒ **D** alkali metals

(c) The table shows some of the gases in group 0 and some of their properties.
The gases are shown in the order in which they appear in group 0.

(i) Fill in the three spaces in the table.

gas	atomic symbol	density / g dm^{-3}	reaction with metals
helium	He	0.12	no reaction
neon	Ne	1.44	no reaction
argon	Ar		no reaction
krypton		3.00	no reaction
xenon	Xe	3.56	

(ii) Some light bulbs contain a metal filament.



These light bulbs are filled with argon.

Explain why argon, instead of air, is used inside these light bulbs.

(2)

.....

.....

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.....

.....

(d) The table shows some solids and some properties of solids.

Draw **one** straight line from each solid to properties of that solid.

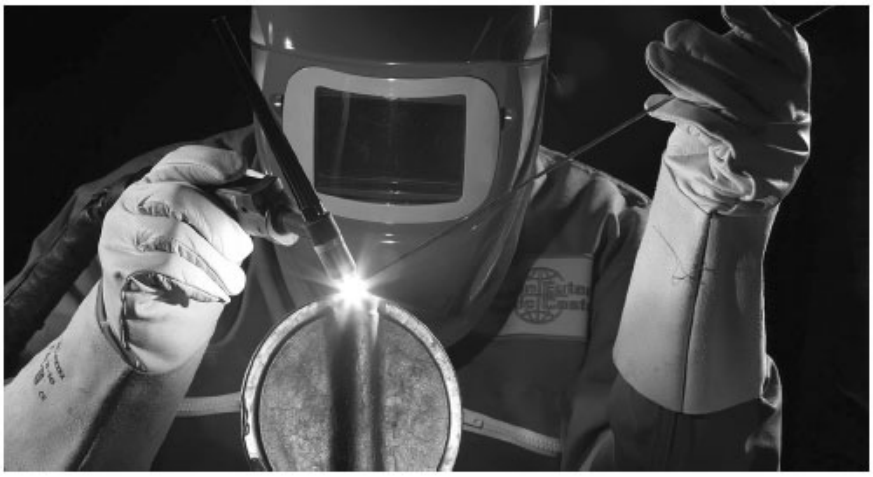
solid	properties of solid
iodine	a soft metal that reacts vigorously with water
potassium	a grey solid that forms a purple vapour when heated
copper	a yellow solid that does not conduct electricity
	a red-brown solid that reacts to form blue compounds

(Total for Question = 9 marks)

(**Q01 1SC0/2CF, June 2013**)

Q13.

(a) Two pieces of metal can be joined by welding them together.



(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

The structure of a metal is a lattice of

(1)

☒ **A** anions

☒ **B** anions and cations

☒ **C** cations in a sea of electrons

☒ **D** molecules in a sea of electrons

(ii) To join two pieces of metal by welding, they must be melted together.

State why a high temperature has to be used.

(1)

.....

.....

(iii) The pieces of metal are welded together in an atmosphere of argon.

Explain why an atmosphere of argon is used.

(2)

.....

.....

.....

.....

(b) Some metals react with halogens.

Iron reacts with bromine, Br_2, to form iron(III) bromide, $FeBr_3$.

Write the balanced equation for this reaction.

(2)

.....

(c) Complete the sentence by putting a cross (☒) in the box next to your answer.

At room temperature, iodine is a

(1)

☒ **A** brown gas

☒ **B** brown liquid

☒ **C** grey solid

☒ **D** purple gas

(d) When a halogen is added to a solution containing halide ions a displacement reaction may occur

In the table

✓ shows a displacement reaction occurs

× shows a displacement reaction does not occur

halogen added	halide ion in solution		
	chloride ion	bromide ion	iodide ion
chlorine		✓	✓
bromine	×		✓
iodine	×	×	

Use the information in the table to explain the order of reactivity of the three halogens.

(2)

.....

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.....

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.....

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(Total for Question = 9 marks)

(**Q01 1SC0/2CH, June 2013**)

Q14.

(i) Figure 6 shows the electron configuration of an argon atom.

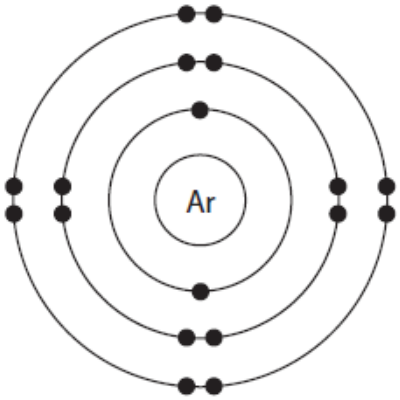


Figure 6

State why argon is unreactive.

(1)

.....

.....

(ii) Argon makes up 0.93% of the Earth's atmosphere today.

$$\% \text{ gas} = \frac{\text{volume of a gas present in air}}{\text{total volume of air}} \times 100$$

Calculate the volume of argon, in cm^3, in 4000 cm^3 of air.

(2)

.....

.....

.....

volume of argon = ... cm^3

(Total for question = 3 marks)

(**QU03d 1SC0/2CF, June 2025**)

Q15.

This question is about the noble gases.

(i) State, in terms of outer shell electrons, why the noble gases are unreactive.

(1)

.....

(ii) Figure 1 shows an airship, filled with helium, floating above the ground.

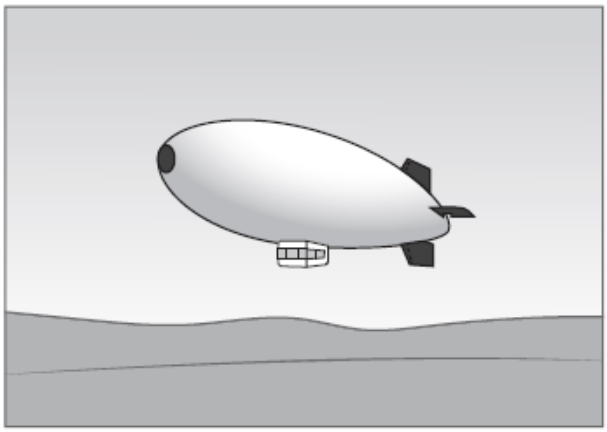


Figure 1

Helium, hydrogen and krypton are gases.
Figure 2 shows the reactivity and density, at room temperature and pressure, of helium, hydrogen and krypton.

gas	reactivity	density in g cm^{-3}
helium	unreactive	0.00018
hydrogen	very reactive	0.00009
krypton	unreactive	0.00380

Figure 2

The density of air is 0.001225 g cm^{-3}.

Helium is used in airships.

Explain why hydrogen and why krypton are **not** used in airships.

(3)

.....

.....

.....

.....

(Total for question = 4 marks)