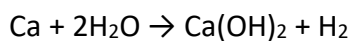


ATOMS, ELEMENTS & COMPOUNDS 2

Q1. The balanced equation shows how the metal calcium reacts with water.



Match words, A, B, C and D, with the numbers 1– 4 in the sentences.

- A element
- B formula
- C molecule
- D symbol

In the equation:

calcium is a metallic . . . 1 . . .

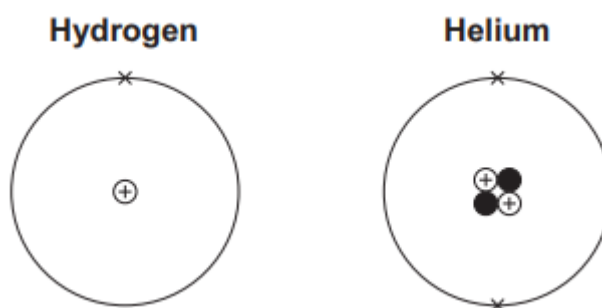
O is the . . . 2 . . . for oxygen

H₂ represents one . . . 3 . . . of hydrogen

Ca(OH)₂ is the . . . 4 . . . for calcium hydroxide.

(4 marks)

Q2. The Sun produces helium atoms from hydrogen atoms by nuclear fusion reactions.



(a) Describe the differences in the atomic structures of a hydrogen atom and a helium atom.

(3 marks)

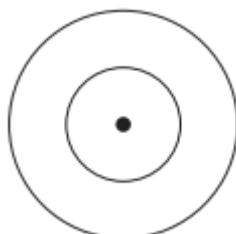
(b) The Sun consists of 73% hydrogen and 25% helium.

The rest is other elements.

One of the other elements in the Sun is neon.

Use the Chemistry Data Sheet to help you to answer these questions.

Complete the diagram to show the electronic structure of a neon atom.



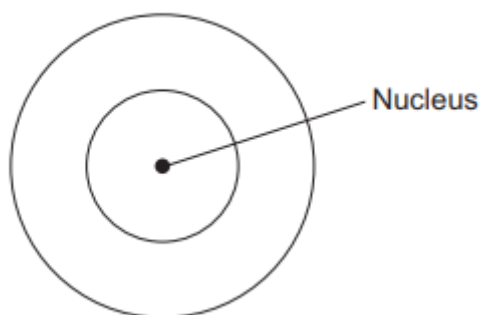
(1 mark)

Q3. The picture shows a diamond ring.



(a) Diamond is a form of carbon. A carbon atom has six electrons.

Draw the electronic structure of a carbon atom.



(1 mark)

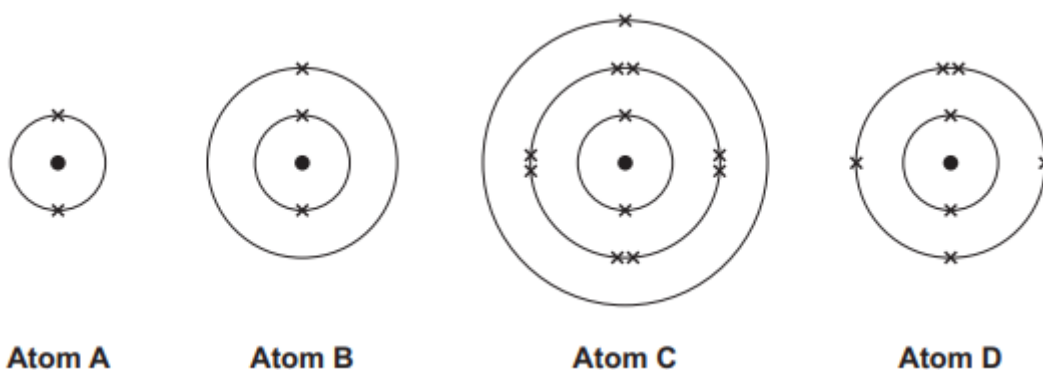
(b) A gold atom has an atomic number of 79 and a mass number of 197.

Complete the table to show the name and number of each sub-atomic particle in this gold atom.

Name	Number
Proton	79
Electron
.....

(3 marks)

Q4. The diagrams show the electronic structure of four different atoms.



Use the Chemistry Data Sheet to help you to answer these questions.

(a) Name the two sub-atomic particles in the nucleus of an atom.

(1 mark)

(b) Why is there no overall electrical charge on each atom?

(1 mark)

(c) Why is Atom A unreactive?

(1 mark)

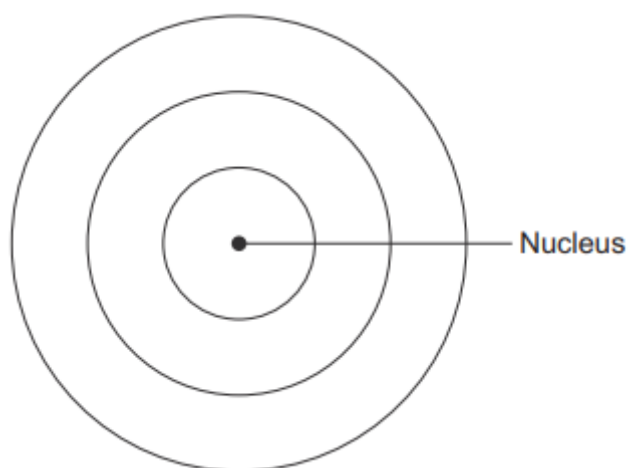
(d) Which two of these atoms have similar chemical properties? Give a reason for your answer.

(2 marks)

Q5. Aluminium has many uses.

An aluminium atom has 13 electrons.

Draw the electronic structure of an aluminium atom.



(1 mark)

Q6. A mixture of iron oxide and aluminium reacts when heated.

This is the balanced equation for the reaction:



Symbols	
Fe	Iron
O	Oxygen
Al	Aluminium

Match words, A, B, C and D, with the numbers 1– 4 in the sentences.

- A electrons
- B bonds
- C products
- D elements

Iron oxide and aluminium are the reactants. Aluminium oxide and iron are the ... 1 ...

Aluminium atoms and oxygen atoms combine by transferring ... 2 ...

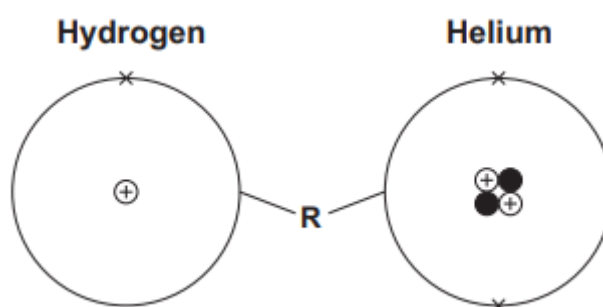
The particles (ions) in aluminium oxide are held together by ... 3 ...

The equation is balanced because, in the reaction, there is no change in the total number of atoms of each of the ... 4 ...

(4 marks)

Q7. The Sun is mainly hydrogen and helium.

The diagrams show an atom of hydrogen and an atom of helium.



(a) Draw a ring around the correct answer to complete each sentence.

(i)

The centre of each atom is called the

molecule.

nucleus.

shell.

(1 mark)

(ii)

The circle (labelled **R**) around the centre of each atom is called

a bond.

an electrical charge.

an energy level (shell).

(1 mark)

(b) Use the diagrams to help you to answer these questions.

Draw one line from each question to its correct answer.

Question	Answer
How many protons are there in the hydrogen atom?	1
How many electrons are there in the helium atom?	2
What is the mass number of the helium atom?	3
	4

(3 marks)

(c) The Sun is 73% hydrogen and 25% helium. The rest is other elements.

What is the percentage of other elements in the Sun? _____ %

(1 mark)

(d) One of the other elements in the Sun is neon.

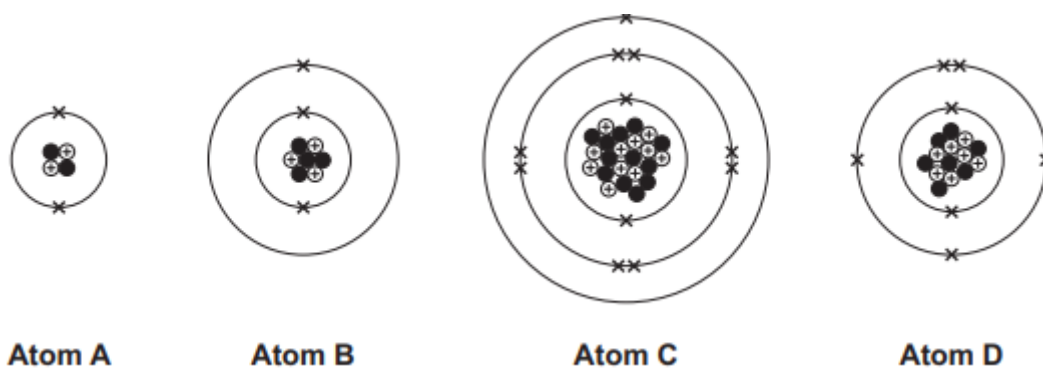
Neon is in the same group of the periodic table as helium.

Use the Chemistry Data Sheet to help you to answer these questions.

How many protons are there in a neon atom?

(1 mark)

Q8. The diagrams show the sub-atomic particles in four different atoms.



Use the Chemistry Data Sheet to help you to answer these questions.

(a) Draw a ring around the correct answer to complete each sentence.

(i)

The centre of each atom is called the

- | |
|---------------|
| energy level. |
| molecule. |
| nucleus. |

(1 mark)

(ii)

The centre of each atom contains neutrons and

- | |
|------------|
| bonds. |
| electrons. |
| protons. |

(1 mark)

(b) Complete the sentence.

There is no overall electrical charge on each atom because the number of is equal to the number of

(1 mark)

(c) What is the name of the element represented by atom D?

(1 mark)

- (d) Which two of the atoms, A, B, C and D, are in the same group of the periodic table?
Give a reason for your answer.

Atom and atom

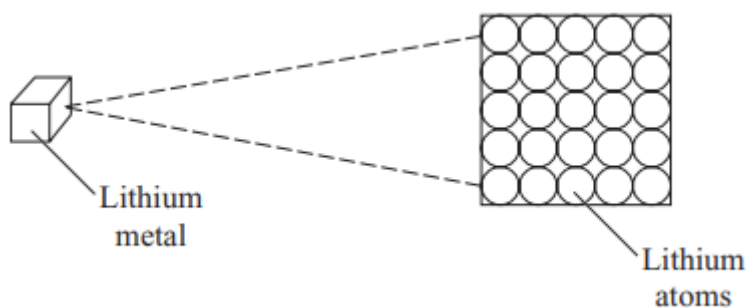
Reason

.....

(2 marks)

Q9. Lithium metal is used in alkaline batteries.

- (a) The diagram shows the atoms in lithium metal.



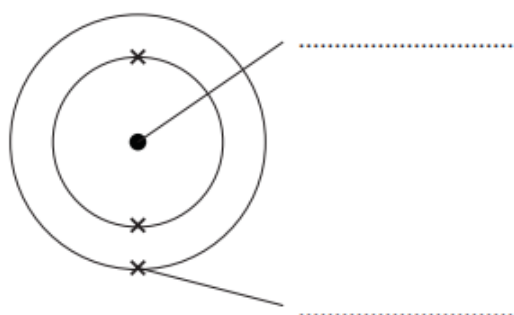
Why is lithium metal described as an element?

(1 mark)

- (b) The diagram below represents a lithium atom.

Choose words from the box to label parts of the atom.

bond	electron	molecule	nucleus
------	----------	----------	---------



(2 marks)

Total marks (38)