

Atomic Structure

Question Paper

Level	GCSE
Subject	Chemistry
Exam Board	Edexcel IGCSE
Module	Single Award (Paper 2C)
Topic	Principles of Chemistry
Sub-Topic	Atomic Structure
Booklet	Question Paper

Time Allowed: 32 minutes

Score: /27

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

- 1 (a) Complete the table to show the relative mass and relative charge of a proton, a neutron and an electron.

(4)

	Proton	Neutron	Electron
Relative mass			1/1840
Relative charge	+ 1		

- (b) The symbol for an atom of one isotope of hydrogen is ${}^3_1\text{H}$

- (i) State the number of protons, neutrons and electrons present in one atom of this isotope.

(2)

Number of protons

Number of neutrons

Number of electrons

- (ii) What is meant by the term **isotopes**?

(2)

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- (c) Bromine has two naturally-occurring isotopes with mass numbers 79 and 81.
A sample of bromine contained the two isotopes in the following proportions:

$$\text{bromine-79} = 50.7\% \quad \text{and} \quad \text{bromine-81} = 49.3\%$$

Use this information to calculate the relative atomic mass of bromine.
Give your answer to **two** decimal places.

(2)

(Total for Question 1 = 10 marks)

2 The table shows the numbers of particles in two atoms, L and M.

	Atom L	Atom M
number of electrons	6	6
number of neutrons	8	6
number of protons	6	6

(a) Which particles are present in the nuclei of both atoms? (1)

- A electrons and neutrons
- B electrons and protons
- C neutrons and protons
- D neutrons, protons and electrons

(b) (i) The atomic number of atom L is (1)

(ii) The mass number of atom L is (1)

(c) Atoms L and M are neutral because (1)

- A the numbers of electrons and neutrons are equal
- B the numbers of electrons and protons are equal
- C the numbers of neutrons and protons are equal
- D the numbers of electrons, neutrons and protons are equal

(d) Use information from the table to explain why atoms L and M are isotopes of the same element. (2)

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(e) The electronic configuration of atom M is (1)

- A 2.2.2
- B 2.4
- C 2.4.6
- D 4.2

(Total for Question 2 = 7 marks)

3 Neon is an element with atomic number 10.

(a) Which sub-atomic particles are present in the nucleus of a neon atom?

(1)

- A electrons and neutrons
- B electrons and protons
- C electrons and neutrons and protons
- D neutrons and protons

(b) Use words from the box to complete the sentences about the particles in a neon atom.

Each word may be used once, more than once or not at all.

(3)

electrons	neutrons	nuclei	protons
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The particles with the smallest mass are

An atom of neon has no overall charge because it contains equal numbers

of and

The chemical properties of neon depend on the number of

..... in the outer shell.

(c) What is the electronic configuration of a neon atom?

(1)

- A 2.8
- B 2.2.6
- C 2.8.8
- D 2.8.8.2

(d) Neon has two main isotopes that can be represented as ^{20}Ne and ^{22}Ne .

(i) Explain, with reference to sub-atomic particles, what is meant by the term **isotopes**.
(2)

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(ii) The relative atomic mass of neon is 20.2

How does this information support the fact that a sample of neon contains more ^{20}Ne than ^{22}Ne ?

(1)

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(e) Neon belongs to the family of noble gases and is inert.

(i) What is meant by the term **inert**?

(1)

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(ii) Why are noble gases inert?

(1)

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(Total for Question 3 = 10 marks)