

Atomic Structure (H)

1. Carbon-12 and carbon-14 are isotopes.

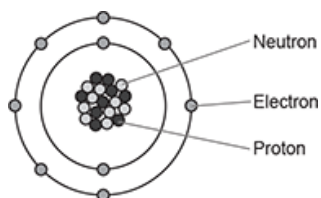
Which statement describes isotopes?

- A Atoms with the same number of protons but a different number of electrons.
- B Atoms with the same number of electrons but a different number of protons.
- C Atoms with the same number of protons but a different number of neutrons.
- D Atoms with the same number of neutrons but a different number of protons.

Your answer

[1]

2. The diagram shows an atom of an element.



What is the name of the element?

- A Boron
- B Beryllium
- C Fluorine
- D Neon

Your answer

[1]

3. The charge on an electron is -1.6×10^{-19} C.

What is the charge on a proton?

- A -1.6×10^{19} C
- B -1.6×10^{-19} C
- C 1.6×10^{-19} C
- D 1.6×10^{19} C

Your answer

[1]

4. The atomic radius of a helium atom is 0.031 nm.

What is the atomic radius of a helium atom in standard form?

- A 3.1×10^{-1}
- B 3.1×10^{-2}
- C 3.1×10^{-3}
- D 3.1×10^{-4}

Your answer

[1]

5. What is the approximate size of an atom?

- A. 3×10^{-1} metres
- B. 3×10^{-5} metres
- C. 3×10^{-9} metres
- D. 3×10^{-13} metres

Your answer

[1]

6 (a). Rutherford was a scientist who helped to develop the atomic model.

State how Rutherford's work contributed to the development of the atomic model.

[1]

(b). Complete the table below to give information about protons, neutrons and electrons.

	Charge	Mass in atomic mass units
proton	.....	1
neutron	.....	.....
electron	negative	.....

[2]

(c). Look at the table. It shows information about some atoms and ions.

Particle	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons	Electronic structure
A	11	23	11	.....	11	2.8.1
B	9	19	9	10	9	.....
C	.....	37	17	.....	17	2.8.7
D	13	27	.....	.....	10	2.8

Complete the table.

[4]

(d). Particle A is a metal atom, particle D is an ion.

Explain why.

[2]

(e). Particle **C** has the electronic structure 2.8.7.

What does this tell you about the position of particle **C** in the Periodic Table?

Explain your answer.

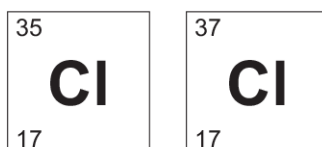
[4]

7.

i. Chlorine is a non-metal.

Chlorine has two common **isotopes**.

Look at the information about the common isotopes of chlorine.



Complete the table to show the atomic structure for each isotope of chlorine.

Isotope	Number of protons	Number of neutrons	Number of electrons
Chlorine-35
Chlorine-37

[2]

ii. Chlorine gas, Cl_2 , reacts with barium, Ba.

Barium chloride, BaCl_2 , is made.

Write a **balanced half** equation for **chlorine** in this reaction.

[1]

iii. Barium chloride solution reacts with sodium sulfate solution, Na_2SO_4 .

A white precipitate of barium sulfate, BaSO_4 , is made.

Write a **balanced ionic** equation to show the formation of barium sulfate.

Include state symbols.

[2]

8.

- i. Mendeleev did not predict the existence of argon, neon, krypton or xenon.

The electron arrangement of argon is 2,8,8.

What does this tell you about the reactivity of argon?

Explain your answer.

----- [2]

- ii. Neon is an element that has isotopes. Two of the isotopes are shown below.



Complete **Table 17.3** to show the number of protons, neutrons and electrons in each neon isotope.

	${}_{10}^{20}\text{Ne}$	${}_{10}^{22}\text{Ne}$
Proton		
Neutron		
Electron		

Table 17.3

[3]

END OF QUESTION PAPER