

Science

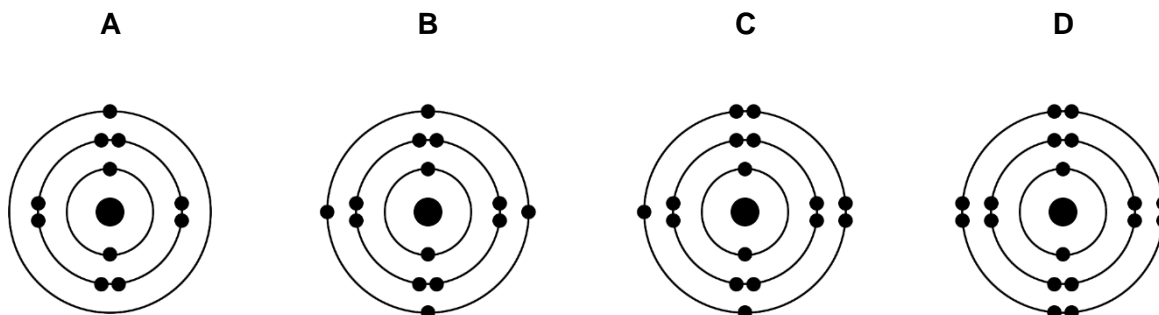
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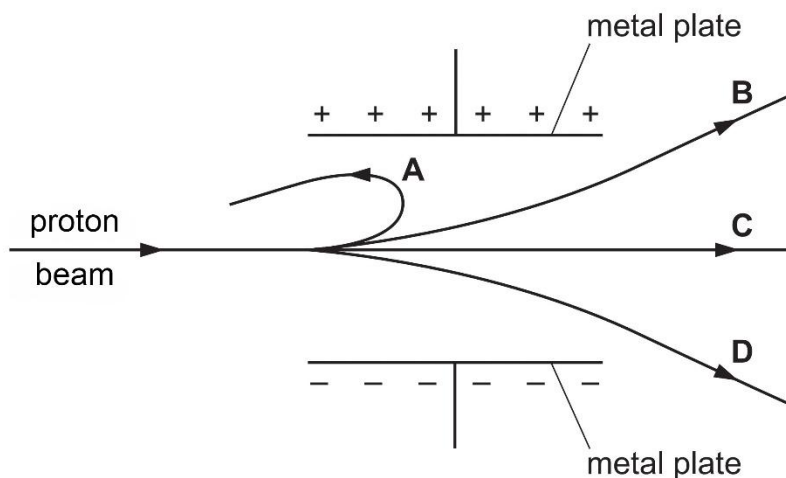
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Multiple-Choice Questions on Atomic Structure

- With the exception of hydrogen, which subatomic particles are typically found in the nucleus of an atom?
A Electrons and neutrons only.
B Electrons and protons only.
C Electrons, neutrons and protons.
D Neutrons and protons only.
- In which option do the three particles each have the same number of electrons?
A Cl^- Br^- I^-
B F^- Ne Na^+
C K^+ Ca^{2+} Br^-
D Li^+ Na^+ K^+
- A particle of an isotope of sulfur contains 18 neutrons and 18 electrons. What is the symbol for this particle?
A ${}_{16}^{34}S^{2+}$ B ${}_{16}^{34}S$ C ${}_{16}^{34}S^{2-}$ D ${}_{16}^{36}S$
- The diagram below shows the electronic configurations of four atoms. Which atom is chemically unreactive?



5. The diagram below shows a beam of protons being fired between two oppositely charged metal plates. Which path would the proton beam take as it passes between the metal plates?



6. Which statement about the particles O^{2-} , F^- , Ne, Na^+ and Mg^{2+} is true?
- A They all contain more electrons than protons.
 B They all contain more neutrons than protons.
 C They all contain the same number of electrons.
 D They all contain the same number of neutrons.
7. The table contains information on the structure of four particles.

particle	proton number	number of protons	number of neutrons	number of electrons
Mg	12	12	W	12
Mg^{2+}	12	12	12	X
F	Y	9	10	9
F^-	9	9	10	Z

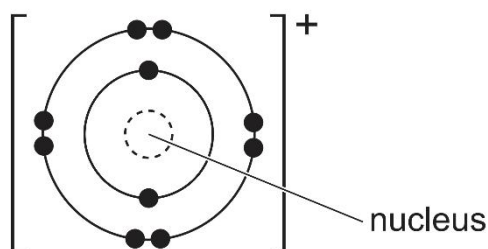
What are the values of **W**, **X**, **Y** and **Z** in the table above?

	W	X	Y	Z
A	10	12	9	10
B	12	10	9	10
C	12	10	10	9
D	12	12	10	9

8. How is a calcium ion, Ca^{2+} , formed from a calcium atom?
- A By gaining two electrons.
 B By gaining two protons.
 C By losing two electrons.
 D By losing two protons.
9. An oxygen atom contains 8 electrons, 8 protons and 10 neutrons.
 What is the nucleon number of this atom?
- A 8 B 10 C 16 D 18
- 10 Which statement about atoms and ions is correct?
- A Atoms and ions of the same element must have different numbers of neutrons.
 B Isotopes of different elements must have different numbers of neutrons.
 C The charge on a positive ion = (nucleon number – number of neutrons – number of electrons).
 D The number of protons and number of neutrons in an atom must be the same.
11. Which row shows the number of particles in ${}_{16}^{34}\text{S}^{2-}$?

	protons	neutrons	electrons
A	16	16	16
B	16	18	18
C	18	16	20
D	20	14	22

12. The diagram of an ion is shown.



What can be deduced about the number of protons in this ion?

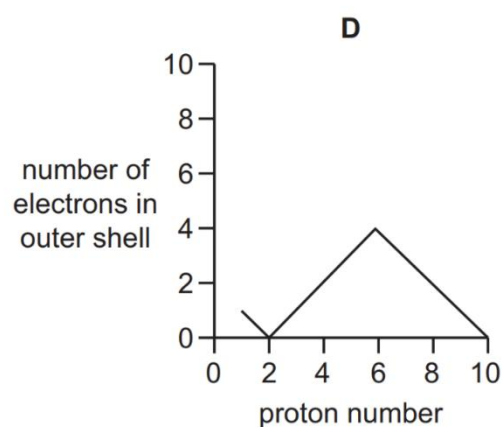
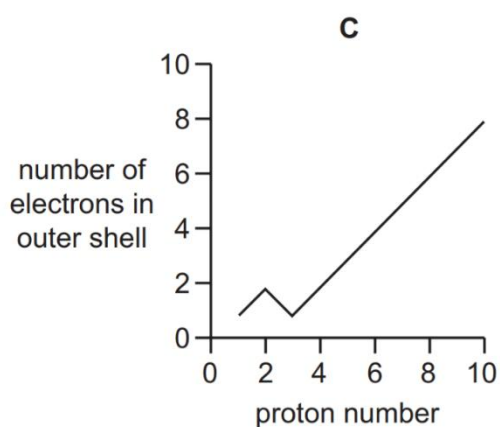
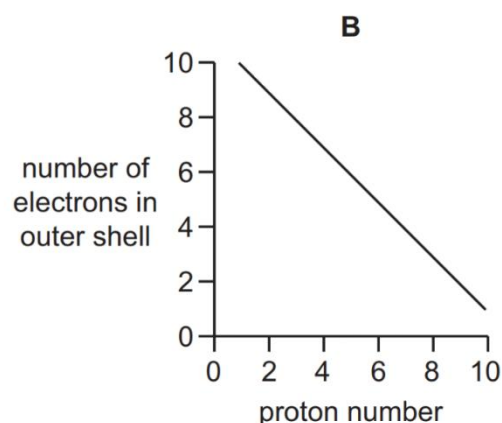
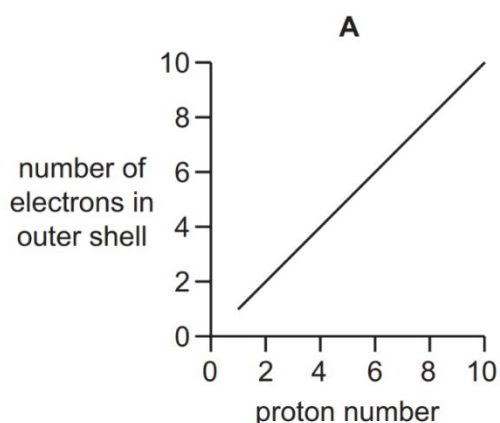
- A It has 9 protons.
 B It has 10 protons.
 C It has 11 protons.
 D You cannot deduce the number of protons from this diagram.

13. A student is given only the nucleon number of an atom.

What can be deduced about the structure of the atom?

- A Number of neutrons plus protons.
- B Number of neutrons only.
- C Number of protons plus electrons.
- D Number of protons only.

14. Which graph shows the number of electrons in the outer shell of an atom, plotted against the proton (atomic) number for the first ten elements in the Periodic Table?



15. A radioactive isotope of carbon has more nucleons than the non-radioactive isotope, $^{12}_6\text{C}$.

How many protons, neutrons and electrons could there be in this **radioactive** isotope of carbon?

	protons	neutrons	electrons
A	6	6	6
B	6	8	6
C	8	6	8
D	8	8	8

16. Which statement about both chlorine atoms and chloride ions is correct?

- A They are chemically identical.
- B They are isotopes of chlorine.
- C They have the same number of protons.
- D They have the same physical properties.

17. An element X forms a positive ion with the electronic structure 2, 8, 8.

What is the proton (atomic) number of X?

- A 16
- B 17
- C 18
- D 19

18. A particle contains 34 protons, 45 neutrons and 36 electrons.

Which symbol is correct for this particle?

- A ${}_{34}^{79}\text{Se}$
- B ${}_{34}^{79}\text{Se}^{-}$
- C ${}_{34}^{79}\text{Se}^{2-}$
- D ${}_{34}^{79}\text{Se}^{2+}$

19. Which particle contains the same number of both neutrons and electrons?

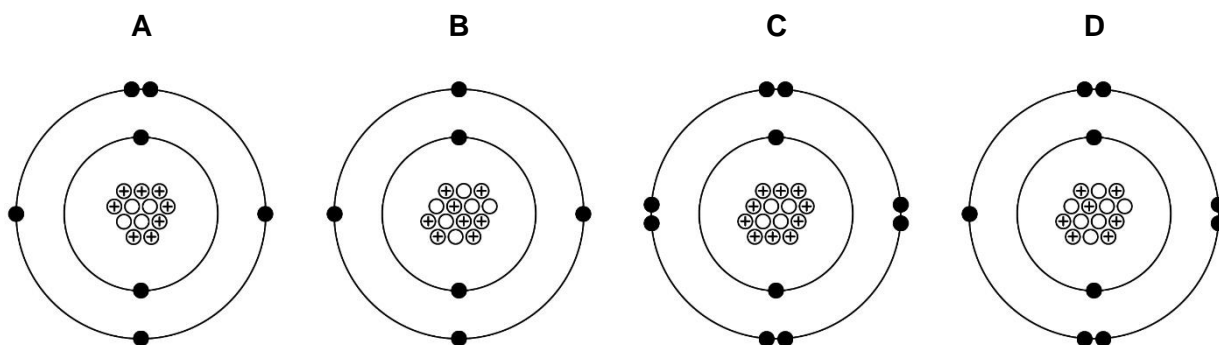
- A ${}_{20}^{40}\text{Ca}^{2+}$
- B ${}_{12}^{24}\text{Mg}^{2+}$
- C ${}_{9}^{19}\text{F}^{-}$
- D ${}_{16}^{32}\text{S}^{2-}$

20. The atomic number of cerium, Ce, is 58. A Ce^{4+} ion has 140 nucleons in its nucleus.

How many protons, neutrons, and electrons are there in one Ce^{4+} ion?

	protons	neutrons	electrons
A	58	82	54
B	58	82	62
C	82	58	54
D	82	58	62

21. Which diagram shows an ion with a charge of +2?



22. The nucleon number of an atom is typically greater than its proton number. The difference between these two numbers indicates the number of ...1... in the atom.

Atoms that have different nucleon numbers but the same proton number are called ...2...

Which words correctly complete gaps 1 and 2?

	1	2
A	electrons	isomers
B	electrons	isotopes
C	neutrons	isomers
D	neutrons	isotopes

- Scan the QR Code below to view the answers to this assignment.



http://www.nygh.sg/lower_secondary_science/sec_one_science/sec_one_chemistry/atomic_structure/atomic_structure_ans.pdf