



Chem!stry

Name: ()

Class:

Date: / /

Twenty-Two Multiple-Choice Questions on Atomic Structure

• Multiple-choice. Write each answer in the space provided (). Each correct answer is worth one mark.

1. Which definition of isotope is correct?

- A Isotopes are atoms of the same element with different numbers of electrons.
- B Isotopes are atoms of the same element with different numbers of neutrons.
- C Isotopes are atoms with the same number of neutrons and a different number of protons.
- D Isotopes are atoms with the same physical properties and different chemical properties.

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2. An isotope of element **X** has 40 nucleons and 19 protons. Which one of the following is element **X**?

- A Argon
- B Calcium
- C Cobalt
- D Potassium

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3. Which statement about an atom is correct?

- A Each element has only one nucleon (mass) number.
- B The nucleon (mass) number can be less than the proton (atomic) number.
- C The nucleon (mass) number can equal the proton (atomic) number.
- D The number of neutrons never equals the number of electrons.

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4. The relative atomic mass of naturally occurring chlorine is **not** a whole number. What is the reason for this?

- A Chlorine atoms can have different numbers of neutrons.
- B Chlorine is unstable.
- C Naturally occurring chlorine cannot be obtained pure.
- D The mass of chlorine's electrons has been included.

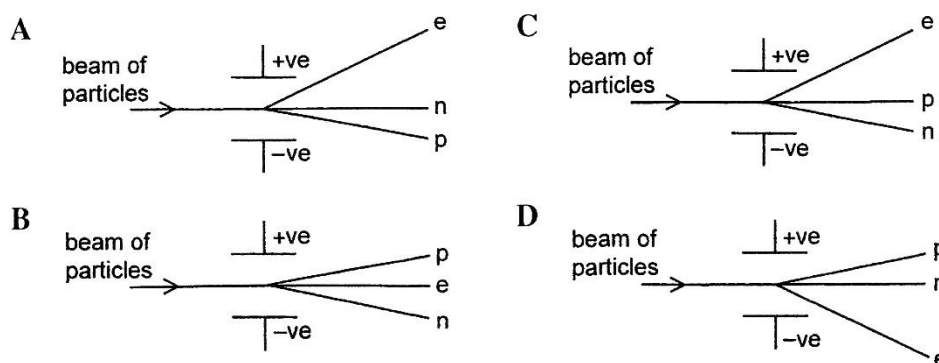
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5. The atoms $^{31}_{15}\text{P}$ and $^{32}_{16}\text{S}$ have the same...

- A Nucleon (mass) number.
- B Number of electrons.
- C Number of neutrons.
- D Number of protons.

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6. A beam of particles contains neutrons, **n**, protons, **p**, and electrons, **e**. The beam is passed between charged plates. Which diagram shows how the particles are affected by the plates?



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7. What is the nucleon (mass) number of the isotope of uranium, ${}_{92}^{235}\text{U}$?

- A** 92 **B** 143 **C** 235 **D** 327

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8. The mass number of an atom is equal to...

- A** The number of neutrons in the atom.
B The number of neutrons and protons in the atom.
C The number of electrons and neutrons in the atom.
D The number of electrons and protons in the atom.

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9. A sodium atom has a mass number of 23 and an atomic number of 11. It follows that the atom contains...

- A** 11 electrons **B** 11 neutrons
C 12 protons **D** 23 neutrons

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10. Which one of the following sets contains only the electronic configurations of **metals**?

- A** 2, 8, 3 2, 8, 4 2, 8, 5
B 2, 7 2, 8, 7 2, 8, 18, 7
C 2, 1 2, 8, 1 2, 8, 8, 1
D 2, 5 2, 6 2, 7

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11. The symbol for an atom of sodium can be written as ${}_{11}^{23}\text{Na}$. The nucleus of the sodium atom contains...

- A** 11 protons and 12 neutrons. **B** 11 neutrons and 12 protons.
C 12 neutrons and 11 electrons. **D** 11 protons and 12 electrons.

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12. Which one of the following elements has the greatest number of electrons in the outermost electron shell (valence shell) of its atoms?

- A Aluminium B Fluorine C Nitrogen D Sodium

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13. Which one of the following particles contains 11 electrons, 11 protons and 12 neutrons?

- A $^{11}_5\text{B}$ B $^{23}_{11}\text{Na}$ C $^{24}_{11}\text{Na}$ D $^{24}_{12}\text{Mg}$

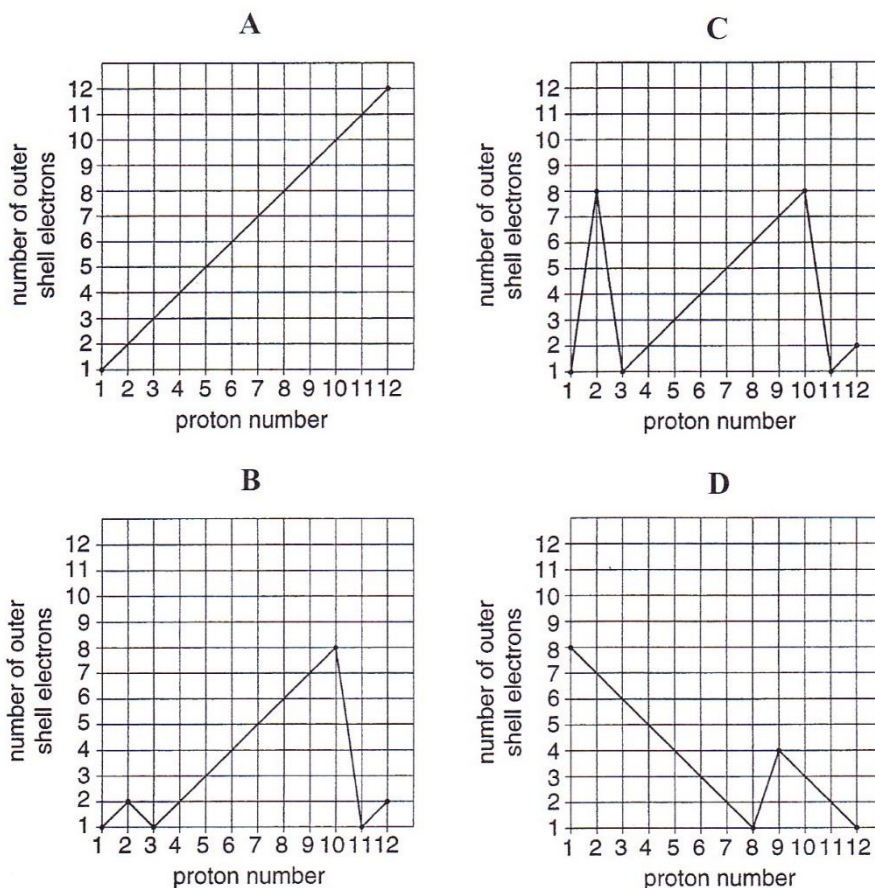
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14. Helium has two isotopes, ^3_2He and ^4_2He . An atom of the lighter isotope contains...

- A Two neutrons.
 B Three electrons.
 C A total of three protons and neutrons.
 D One fewer proton than an atom of the heavier isotope.

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15. The number of outer (valence) shell electrons for the atoms of the first 12 elements in the Periodic Table was plotted against the proton (atomic) number of the element. Which one of the following graphs was obtained?



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16. Isotopes of an element have different...
- A Atomic numbers.
 - B Numbers of electrons.
 - C Numbers of electron shells.
 - D Numbers of neutrons.
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17. Isotopes are different atoms with the same number of...
- A Electrons, protons and neutrons.
 - B Electrons, but a different number of protons.
 - C Neutrons, but a different number of protons.
 - D Protons, but a different number of neutrons.
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18. Two naturally occurring isotopes of uranium can be represented as ${}_{92}^{235}\text{U}$ and ${}_{92}^{238}\text{U}$. Which one of the following statements about the isotopes is correct?
- A The ${}_{92}^{235}\text{U}$ atom has the same number of neutrons as the ${}_{92}^{238}\text{U}$ atom.
 - B The ${}_{92}^{235}\text{U}$ atom has fewer electrons than the ${}_{92}^{238}\text{U}$ atom.
 - C The ${}_{92}^{235}\text{U}$ atom has 92 protons and 144 neutrons.
 - D The ${}_{92}^{238}\text{U}$ atom has 92 electrons and 146 neutrons.
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19. Why are the elements sodium and chlorine in the same Period of the Periodic Table?
- A Sodium is a reactive metal, and chlorine is a reactive non-metal.
 - B Sodium and chlorine combine together to form a compound with the formula NaCl .
 - C The atoms of both elements have only three electron shells containing electrons.
 - D The atoms of both elements have eight electrons in their second electron shell.
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20. An atom of element X has the symbol ${}^7_3\text{X}$. Which statement about element X is correct?
- A It is in Group 13 of the Periodic Table.
 - B It is in Group 17 of the Periodic Table.
 - C In one atom, the number of protons + the number of electrons = 6.
 - D In one atom, the number of protons + the number of neutrons = 10.
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21. Which statement about the noble gases is correct?
- A The number of protons in the atoms equals the number of neutrons.
 - B Their atoms each have a stable arrangement of electrons.
 - C Their atoms each have eight electrons in their outer shell.
 - D They exist as molecules containing two atoms.
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22. The table shows information about particles X and Y.

	Number of Protons	Number of Neutrons	Electronic Structure
X	11	12	2, 8, 1
Y	19	20	2, 8, 8, 1

Which statement is correct for both X and Y?

- A They are atoms of non-metals.
- B They are isotopes of the same element.
- C They are from the same Group of the Periodic Table.
- D They are from the same Period of the Periodic Table.

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- Scan the QR code below for the answers to this assignment.



http://www.chemist.sg/chemical_bonding/atomic_structure/atomic_structure_mcq_ans.pdf