

MATHS4U

Chemistry NTSE

It's all about believing Topic:- Structure of Atoms

1. The e/m ratio of an electron for all types of substances (a) constant (b) less than one (c) greater than one (d) zero
2. A proton is identical to (a) the nucleus of helium (b) the nucleus of a hydrogen atom (c) a molecule of a hydrogen (d) an atom of hydrogen
3. An α particle is (a) a hydrogen molecule (b) a helium nucleus (c) an electron (d) a proton
4. The atomic number of an element is determined by (a) the number of electrons in one atom (b) the number of neutrons in one atom (c) the valency of the element (d) the number of protons in one atom
5. The value of e/m of an electron was measured by (a) Millikan (b) J.J Thomson (c) Dalton (d) Rutherford
6. The atomic number of an element is 11 and its mass number is 23. The respective number of electrons, protons and neutrons in this atom will be. (a) 11, 11, 12 (b) 11, 12, 11 (c) 12, 11, 11 (d) 23, 11, 23
7. The number of electrons in the outer shell of the most stable or inert atoms is (a) 1 (b) 4 (c) 6 (d) 8
8. Which of the following pairs are isotopes? (a) Oxygen and ozone (b) Ice and steam (c) Nitric oxide and nitrogen dioxide (d) Hydrogen and deuterium
9. An atom which has a mass number of 14 and has 8 neutrons is an (a) isotope of oxygen (b) isobar of oxygen (c) isotope of carbon (d) isobar of carbon
10. Which of the following has an equal number of neutrons and protons? (a) Hydrogen (b) Deuterium (c) Fluorine (d) Chlorine
11. Members of which of the following have similar chemical properties? (a) Isotope (b) Isobars (c) Allotropes (d) Both isotopes and allotropes
12. An atom of an element has 26 electrons and has mass number 56. The nucleus of this atom contains neutrons (a) 26 (b) 36 (c) 30 (d) 56
13. For an element with atomic number 19, the 19th electron will occupy (a) L - shell (b) M - shell (c) N - shell (d) K - shell
14. The number of electrons in an element with atomic number X and atomic mass Y will be (a) $X - Y$ (b) $Y - X$ (c) $X + Y$ (d) X
15. A natural phenomenon that supports the experimental conclusion that atoms are divisible is (a) allotropy (b) radioactivity (c) cracking (d) none of these
16. The relative atomic masses of many elements are not whole numbers because (a) they cannot be determined very accurately (b) the atoms ionize during the determinations (c) of the existence of isotopes (d) of the presence of impurities
17. The valency of an element is (a) the mass of the element displacing 1 part by the mass of hydrogen (b) the mass of the element combining with 8 parts by mass of oxygen (c) the number of atoms of hydrogen combining with 1 atom of the given element (d) the number of atom in 1 molecule of the given element
18. The diagram given below represents an atom of (a) chlorine (b) magnesium (c) calcium (d) helium
19. Which of the following atoms has a valency equal to zero? (a) Hydrogen (b) Lithium (c) Neon (d) Oxygen
20. Which of the following scientist determined the charge to mass ratio of the particles of positive rays? (a) J.J Thomson (b) R.A. Millikan (c) E. Rutherford (d) W. Wien
21. Bohr's model explains (a) the spectrum of hydrogen atom only (b) the spectrum of any atom or ion having one electron only (c) the spectrum of hydrogen molecule (d) the solar spectrum
22. The cathode rays tube experiments carried out by J. J Thomson demonstrated that (a) the ratio of charge - to mass for the particles of the cathode rays varies as different gases are placed in the tube (b) the mass of an atom is essentially all contained in its very small

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- nucleus (d) cathode rays are streams of negatively charged ions (d) the charge to mass ratio for a proton
23. When an alpha (α) particle is sent through a thin metal foil, most of them go straight through the foil because (a) α - particles are much heavier than electrons (b) α particles are positively charged (c) most - part of the atom is empty space (d) α - particles move with high velocity
24. Which of the following electron transitions in hydrogen require the largest amount of energy? (a) $n_L = 1$ to $n_H = 2$ (b) $n_L = 2$ to $n_H = 3$ (c) $n_L = 1$ to $n_H = \infty$ (d) $n_L = 3$ to $n_H = 5$
25. The two electrons occupying an orbital are distinguished by (a) principal quantum number (b) angular momentum quantum number (c) magnetic quantum number (d) spin quantum number
26. When the angular momentum quantum number, $l = 1$, the shape of the orbital will be (a) spherical (b) dumbbell (c) double dumbbell (d) more complicated
27. In a set of degenerate orbitals the electrons distribute themselves to retain similar spins as far as possible. The statement is attributed to (a) Pauli's exclusion principle (b) Hund's principle (c) Aufbau's principle (d) Slater's rule
28. For a given principal quantum number $n = 4$, the energy of its sub shells follows the order (a) $s < p < d < f$ (b) $s < d < f < p$ (c) $s < p < f < d$ (d) $d < f < p < s$
29. Which of the following subshell can accommodate a maximum number of electrons? (a) 3s (b) 2p (c) 3d (d) 2s
30. The number of electrons that can be accommodated in 3p atomic orbital is (a) 2 (b) 4 (c) 6 (d) 8

Answer

- 1.a 2.D 3.B 4.D 5.A 6.A 7.D 8.D 9.C 10.B 11.A 12.C 13.B 14.D 15.B 16.C 17.C
18.B 19.C 20.D 21.D 22.D 23.C 24.A 25.D 26.B 27.B 28.A 29.C 30.A