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# Chemistry ATOMIC STRUCTURE

## MCQs for Lecturer Preparation Solved

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## Chemistry ATOMIC STRUCTURE

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Q.1 Splitting of spectral lines when atoms are subjected to strong electric field is called

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- (a) Zeeman effect                      **(b) Stark effect**  
(c) Photoelectric effect              (d) Compton effect

Q.2 The velocity of photon is

- (a) independent of its wavelength**  
(b) depends on its wavelength  
(c) equal to square of its amplitude  
(d) depends on its source

Q.3 The nature of positive rays depend on

- (a) the nature of electrode  
(b) the nature of discharge tube  
**(c) the nature of residual gas**  
(d) all of the above

Q.4 The wave number of the light emitted by a certain source is  $2 \times 10^6 \text{ m}^{-1}$ . The wavelength of this light is

- (a) 500 nm**                                      (b) 500 m  
(c) 200 nm                                      (d)  $5 \times 10^{-1} \text{ m}$

Q.5 Rutherford's model of atom failed because

- (a) the atom did not have a nucleus and electrons  
(b) it did not account for the attraction between protons and neutrons

**(c) it did account for the stability of the atom**

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(d) there is actually no space between the nucleus and the electrons

Q.6 Bohr's model of atom is contradicted by

- (a) Planck's quantum theory
- (b) Pauli exclusion principle
- (c) Heisenberg uncertainty principle**
- (d) All of the above

Q.7 Quantum number value for 2p orbitals are

- (a)  $n = 2, l = 1$**
- (b)  $n = 1, l = 2$
- (c)  $n = 1, l = 0$
- (d)  $n = 2, l = 0$

Q.8 In the ground state of an atom, the electron is present

- (a) in the nucleus
- (b) in the second shell
- (c) nearest to the nucleus**
- (d) farthest from the nucleus

Q.9 When the 6d orbital is complete the entering electron goes into

- (a) 7f
- (b) 7s
- (c) 7p**
- (d) 7d

Q.10 Orbitals having same energy are called

- (a) hybrid orbitals
- (b) valence orbitals
- (c) degenerate orbitals**
- (d) d-orbitals

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- Q.11 The e/m value for the positive rays is maximum for  
(a) **hydrogen** (b) helium  
(c) nitrogen (d) oxygen
- Q.12 Neutron was discovered by Chadwick in  
(a) 1935 (b) 1930  
(c) **1932** (d) 1934
- Q.13 The velocity of photon is  
(a) equal to square of its amplitude  
(b) independent of its wavelength  
(c) Equal to its wave number  
(d) **equal to the velocity of light**
- Q.14 Quantum number values for 3p orbitals are  
(a)  $n = 0, l = 3$  (b)  **$n = 3, l = 1$**   
(c)  $n = 2, l = 1$  (d)  $n = 1, l = 3$
- Q.15 The radius of first orbit of hydrogen atom  
(a) 0.329  $A_0$  (b) 0.429  $A_0$   
(c) **0.529  $A_0$**  (d) 0.229  $A_0$
- Q.16 All atoms are principally composed of few fundamental particles which are in number  
(a) 2 (b) **3**  
(c) 4 (d) 5

Q.17 Which scientist gave the name of electron to the cathode rays

- (a) Planck (b) Einstein  
(c) **Stoney** (d) Bohr

Q.18 The divisibility of atom was showed by

- (a) Stoney (b) **J.J. Thomson**  
(c) Millikan (d) Rutherford

Q.19 The nature of cathode rays remains the same irrespective of the

material used for

- (a) gas (b) cathode  
(c) glass (d) **electrode**

Q.20 Mass of electron is

- (a)  **$9.1 \times 10^{-31} \text{ kg}$**  (b)  $9.109 \times 10^{-32} \text{ gm}$   
(c)  $8.1 \times 10^{-31} \text{ g}$  (d)  $9.1 \times 10^{-31} \text{ mg}$

Q.21 The charge on an electron is

- (a)  $1.602 \times 10^{-19} \text{ c}$  (b)  $1.602 \times 10^{-18} \text{ c}$   
(c)  **$1.602 \times 10^{-19} \text{ c}$**  (d)  $1.602 \times 10^{-21} \text{ c}$

Q.22 The charge on the proton is

- (a)  **$+ 1.602 \times 10^{-19} \text{ c}$**  (b) zero

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(c)  $-1.602 \times 10^{19} \text{ c}$  (d)  $1.602 \times 10^{-19} \text{ c}$

Q.23 The charge on the neutron is

(a)  $1.602 \times 10^{-19} \text{ c}$  (b) **zero**  
(c)  $-1.602 \times 10^{-19} \text{ c}$  (d)  $+1.602 \times 10^{-19} \text{ c}$

Q.24 The calculated e/m value of electron is

(a)  $1.602 \times 10^{19} \text{ c kg}^{-1}$  (b)  **$1.7588 \times 10^{-11} \text{ c kg}^{-1}$**   
(c)  $1.7588 \times 10^{-13} \text{ c kg}^{-1}$  (d)  $1.759 \times 10^9 \text{ c kg}$

Q.25 The mass of proton is

(a)  $9.11 \times 10^{-31} \text{ kg}$  (b)  **$1.676 \times 10^{-27} \text{ kg}$**   
(c)  $1.60 \times 10^{-19} \text{ kg}$  (d)  $1.675 \times 10^{-27} \text{ kg}$

Q.26 The mass of neutron is

(a)  **$1.675 \times 10^{-27} \text{ kg}$**  (b)  $1.675 \times 10^{-25} \text{ kg}$   
(c)  $9.11 \times 10^{-31} \text{ kg}$  (d)  $1.60 \times 10^{-19} \text{ kg}$

Q.27 The charge on electron was determined by

(a) J.J. Thomson (b) **Millikan**  
(c) Rutherford (d) Bohr

Q.28 Alpha particles are identical to

(a) hydrogen atoms (b) helium atoms  
(c) **helium nuclei** (d) fast moving

electrons

Q.29 Bombardment of Beryllium with alpha particles generates

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- (a) proton (b) **neutron**  
(c) electron (d) positron

Q.30 The colour of the glow produced in the discharge tube depends upon

- (a) gas (b) electrodes  
(c) **composition of gas** (d) pressure

Q.31 When the pressure of the gas in discharge tube is reduced, which

of the following becomes more prominent

- (a) gas glows (b) gas ionizes  
(c) **a discharge takes place** (d) gas conducts

electricity

Q.32 Goldstein discovered that besides the cathode rays, another type of rays are produced in the discharge tube which are called

- (a) alpha rays (b) beta rays  
(c) **positive rays** (d) gamma rays

Q.33 The  $e/m$  value for the positive rays in the discharge tube depends upon

- (a) nature of electrode use  
(b) **nature of gas used**  
(c) composition of the gas

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(d) pressure

Q.34 The distance between the two adjacent crests or troughs is called

- (a) wave number (b) frequency  
**(c) wavelength** (d) amplitude

Q.35 The value of Planck's constant "h" is

- (a)  $6.625 \times 10^{-34}$  cal (b)  **$6.625 \times 10^{-34}$**   
**J sec**  
(c)  $6.625 \times 10^{-34}$  kJ (d)  $6.625 \times 10^{-34}$  k cal

Q.36 In the Bohr's model of atom the electron in an energy level emits or absorbs energy only when it

- (a) remains in the same energy level  
(b) dies out  
**(c) changes its energy level** (  
(d) jumps away

Q.37 The energy associated with an electron revolving in first orbit is

- (a)  $- 2.178 \times 10^{-18}$  k J/mol  
**(b)  $- 1313.31$  k J/mol**  
(c)  $- 328.32$  k J/mol  
(d)  $- 82.08$  k J/mol

Q.38 The regions of spectrum are

- (a) three (b) seven  
(c) **eight** (d) five

Q.39 The dispersion of the components of white light when it is passed through prism is called

- (a) rainbow (b) light pattern  
(c) refraction (d) **spectrum**

Q.40 Which of the following colours has the shortest wavelength in the visible spectrum of light

- (a) red (b) blue  
(c) **violet** (d) green

Q.41 Which of the following colours has the longest wavelength in the visible spectrum of light

- (a) **red** (b) blue  
(c) violet (d) green

Q.42 A spectrum containing wavelength of all wavelengths is called

- (a) **continuous** (b) discontinuous  
(c) line (d) atomic

Q.43 A spectrum showing only certain colours of light is called

- (a) continuous (b) **line**  
(c) discontinuous (d) band

Q.44 The wavelength range of visible spectrum is

- (a) **400–750 nm** (b) 300–400 nm  
(c) 350–600 nm (d) 200–400 nm

Q.45 The spectral lines of Lyman series (uv region) are produced when electron jumps from higher orbit to

- (a) **1st orbit** (b) 2nd orbit  
(c) 3rd orbit (d) 4th orbit

Q.46 The spectral lines of Balmer series (visible region) are produced when electron jumps from higher orbit to

- (a) 1st orbit (b) **2nd orbit**  
(c) 3rd orbit (d) 4th orbit

Q.47 The spectral lines of Paschen series (visible region) are produced when electron jumps from higher orbit to

- (a) 1st orbit (b) 2nd orbit  
(c) **3rd orbit** (d) 4th orbit

Q.48 The spectral lines of Bracket series (visible region) are produced when electron jumps from higher orbit to

- (a) 1st orbit (b) 2nd orbit  
(c) 3rd orbit (d) **4th orbit**

Q.49 A dual character of matter particles in motion was postulated by

- (a) **De-Broglie** (b) Planck

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(c) Einstein (d) Schrodinger

Q.50 If an electron is moving with a velocity of  $2.188 \times 10^6$  m/s then its wavelength will be

(a)  $0.33 \times 10^6$  nm (b)  $0.33 \times 10^{-2}$  nm  
(c) **0.33 nm** (d) 0.22 nm

Q.51 If a stone of 1gm is moving with a velocity of 10m/s then its wavelength will be

(a)  **$6.65 \times 10^{-30}$  m** (b)  $6.65 \times 10^{-25}$  m  
(c)  $6.65 \times 10^{-28}$  m (d)  $6.65 \times 10^{-12}$  m

Q.52 The space around the nucleus where the probability of finding the electron is maximum is called

(a) **an orbital** (b) an orbit  
(c) energy level (d) a shell

Q.53 Which orbital has dumb-bell shape

(a) s-orbital (b) **p-orbital**  
(c) d-orbital (d) f-orbital

Q.54 Which of the following quantum numbers describes energy of an electron in an atom

(a) **principal quantum number** (b) azimuthal quantum number  
(c) magnetic quantum number (d) spin quantum number

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Q.55 Which of the following quantum numbers describes shape of an electron in an atom

- (a) principal quantum      (b) **azimuthal quantum**  
(c) magnetic quantum      (d) spin quantum

Q.56 The degenerate orbital in p-subshell is

- (a) 2      (b) **3**  
(c) 5      (d) 7

Q.57 When 4p orbital is complete the entering electron goes into

- (a) 4d      (b) 4f  
(c) **5s**      (d) 5p

Q.58  $x + l$  value for 3d will be

- (a) 3      (b) 4  
(c) **5**      (d) 6

Q.59 Maximum number of electrons in 3f orbitals is

- (a) 2      (b) **zero**  
(c) 6      (d) 14

Q.60 Maximum number of electrons in M-shell is

- (a) 2      (b) 8  
(c) **18**      (d) 32

Q.61 An orbital can have maximum electrons

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- (a) 2 (b) 8  
(c) 18 (d) 6

Q.62  $n + l$  value for  $4f$  will

- (a) 2 (b) 5  
(c) 7 (d) 9

Q.63 When a spectrum of light is formed by the radiation given off by a substance it is called

- (a) line spectrum (b) continuous spectrum  
(c) **emission spectrum** (d) absorption spectrum

Q.64 Neutron was discovered by

- (a) **Chadwick** (b) Bohr  
(c) J.J. Thomson (d) Einstein

Q.65 Cathode rays can drive a small paddle wheel which shows that they

- (a) are positively charged  
(b) **possess momentum**  
(c) do not possess momentum  
(d) none of these

Q.66 Slow neutrons are generally more effective than fastness for the purpose of

- (a) effusion (b) **fission**

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- (c) penetration (d) absorption

Q.67 The wavelength associated with the moving stone

- (a) can be measured by many methods  
**(b) cannot be measured by any method**  
(c) can be measure by some method  
(d) none of these

Q.68 Radius of orbit of an electron and velocity of electron are

- (a) directly proportional to each other  
**(b) inversely proportional to each other**  
(c) independent to each other  
(d) none of these

Q.69 The values of magnetic quantum number give us information about the number of orbitals in a

- (a) small shell (b) orbit  
**(c) subshell** (d) none of these

Q.70 Which of the following terms are used for the number of positive charges on the nucleus of an atom

- (a) atomic number** (b) atomic mass  
(c) nuclear charge (d) atomic charge

Q.71 The uncertainty principle was stated by

- (a) de Broglie (b) **Heisenberg**

- (c) Einstein (d) Schrodinger

Q.72 When a pressure in a discharge tube is reduced, which of the following phenomenon becomes very prominent

- (a) gas conducts electricity  
**(b) a discharge takes place**  
(c) gas ionizes  
(d) gas glows

Q.73 Atom bomb is based on the principle of

- (a) nuclear fusion  
**(b) nuclear fission**  
(c) fusion and fission both  
(d) radioactivity

Q.74 A spinning electron creates

- (a) **magnetic field** (b) electric field  
(c) quantum field (d) none of these

Q.75 The volume of space in which there is 95% chance of finding an electron is

- (a) orbit (b) **atomic orbital**  
(c) degenerate orbital (d) quantized orbital

Q.76 Planck's equation is

- (a)  $E = mc^2$  (b)  **$E = hv$**

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(c)  $E = hv$  (d)  $E = mc$

Q.77 In an atom, the electrons

a) are stationary in various energy levels

**(b) are distributed in three dimensional charge cloud around the nucleus**

(c) embedded in space around the nucleus

(d) revolve around the nucleus at random

Q.78 The mass number of an element is equal to

(a) number of electrons in an atom

**(b) number of protons and neutrons in the nucleus**

(c) number of protons in the nucleus

(d) number of neutrons in the nucleus

Q.79 The energy of bounded electron in H atom is

(a) positive (b) **negative**

(c) zero (d) none of these

Q.80 Quantum number which has symbol "n" is called

(a) **principal quantum** (b) Azimuthal quantum

(c) Spin quantum (d) Magnetic quantum

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