



VISWASAI MEDICAL ACADEMY

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BIPC

CHEMISTRY

[ATOMIC STRUCTURE, CHEMICAL BONDING]

WORK SHEET - 1

- What is likely to be principal quantum number for a circular orbit of diameter 21 nm of the hydrogen atom if we assume Bohr orbit be the same as that represented by the principal quantum number ?
1) 10 2) 14 3) 12 4) 16
- In a certain electronic transition in the hydrogen atoms from an initial state (1) to a final state (2), the difference in the orbit radius ($r_1 - r_2$) is 24 times the first Bohr radius. Identify the transition -
1) $5 \rightarrow 1$ 2) $25 \rightarrow 1$ 3) $8 \rightarrow 3$ 4) $7 \rightarrow 5$
- Choose the incorrect relation on the basis of Bohr's theory -
1) velocity of electron $\propto \frac{1}{n}$
2) frequency of revolution $\propto \frac{z^2}{n^3}$
3) radius of orbit $\propto n^2 z$
4) KE of electron $\propto \frac{1}{n^2}$
- The magnetic momentum M^{+2} is 4.54×10^{-23} J/T. The element is (1 BM = 9.27×10^{-24} J/T)
1) Fe 2) Ni 3) Mn 4) V
- Which quantum number is not related with Schrodinger equation :-
1) Principal 2) Azimuthal 3) Magnetic 4) Spin
- The shortest wavelength of He⁺ in Balmer series is x, then longest wavelength in the Paschene series of Li²⁺ is
1) $\frac{36x}{5}$ 2) $\frac{16x}{7}$ 3) $\frac{9x}{5}$ 4) $\frac{5x}{9}$
- In compound FeCl₂ the orbital angular momentum of last electron in its cation & magnetic moment (in Bohr Magneton) of this compound are
1) $\sqrt{6}\hbar, \sqrt{35}$ 2) $\sqrt{6}\hbar, \sqrt{24}$
3) $0, \sqrt{35}$ 4) $\sqrt{3}, \sqrt{35}$
- If in Bohr's model, for unielectronic atom, time period of revolution is represented as $T_{n,z}$ where n represents shell no. and z represents atomic number then the value of $T_{1,2} : T_{2,1}$ will be
1) 8 : 1 2) 1 : 8 3) 1 : 1 4) 1 : 32
- For which orbital angular probability distribution is maximum at an angle of 45° to the axial direction
1) $d_{x^2-y^2}$ 2) d_{z^2} 3) d_{xy} 4) P_x
- Consider an electron in the nth orbit of a hydrogen atom in the Bohr model. The circumference of the orbit can be expressed in terms of the de Broglie wavelength λ of the electron as :-
1) $(0.529) n\lambda$ 2) $\sqrt{n}\lambda$ 3) $(13.6) n\lambda$ 4) $n\lambda$
- According to Schrodinger model nature of electron in an atom is as :-
1) Particles only 2) Wave only
3) Both simultaneously
4) Sometimes waves and sometimes particle
- Which describes orbital :-
1) ψ 2) ψ^2 3) ψ^2 / ψ 4) ψ / ψ^2
- An ion with mass number 37 posses one unit negative charge, if ion contains 11.1% more neutrons than electrons, the atomic number of the element is
1) 17 2) 18 3) 21 4) 25
- Statement-I : 2p orbitals do not have spherical nodes.
Statement-II : The number of spherical nodes in p-orbitals is given by (n - 2).
1) Statement-I is true, Statement-II is true ; Statement-II is correct explanation for Statement-I.
2) Statement-I is true, Statement-II is true ; Statement-II is NOT a correct explanation for statement-I
3) Statement-I is true, Statement-II is false
4) Statement-I is false, Statement-II is true
- The correct order of the bond angles is
1) $NH_3 > H_2O > PH_3 > H_2S$
2) $NH_3 > PH_3 > H_2O > H_2S$
3) $NH_3 > H_2S > PH_3 > H_2O$
4) $PH_3 > H_2S > NH_3 > H_2O$
- The correct increasing bond angle among BF_3, PF_3 and ClF_3 follows the order
1) $BF_3 < PF_3 < ClF_3$ 2) $PF_3 < BF_3 < ClF_3$
3) $ClF_3 < PF_3 < BF_3$ 4) $BF_3 = PF_3 = ClF_3$

17. The volatility of HF is low as compare to other Hydra acid of Halogen because of :-
 1) its low polarizability
 2) the weak dispersion interaction between the molecules
 3) its small molecular mass
 4) its strong hydrogen bonding
18. Amongst LiCl, RbCl, BeCl₂ and MgCl₂, the compounds with the greatest and the least ionic character, respectively are
 1) LiCl and RbCl 2) RbCl and BeCl₂
 3) RbCl and MgCl₂ 4) MgCl₂ and BeCl₂
19. In ICl_4^+ , the shape is square planar. The number of bond pair-lone pair repulsion at 90° are
 1) 6 2) 8 3) 12 4) 4
20. Among the following species, identify the isostructural pairs: $NF_3, NO_3^-, BF_3, H_3O^+, HN_3$
 1) $[NF_3, NO_3^-]$ and $[BF_3, H_3O^+]$
 2) $[NF_3, HN_3]$ and $[NO_3^-, BF_3]$
 3) $[NF_3, H_3O^+]$ and $[NO_3^-, BF_3]$
 4) $[NF_3, H_3O^+]$ and $[HN_3, BF_3]$
21. Which condition favours the bond formation
 1) maximum attraction and maximum potential energy
 2) minimum attraction and minimum potential energy
 3) minimum potential energy and maximum attraction
 4) none of the above
22. Which of the following has fractional bond order
 1) O_2^{2+} 2) O_2^{2-} 3) F_2^{2-} 4) H_2^-
23. Which is most ionic :
 1) P_2O_5 2) MnO 3) CrO_3 4) Mn_2O_7
24. Incorrect statement is
 1) The formal charge on oxygen atom of PO_4^{3-} is -0.75
 2) The number of ABO in O_2^{-2} is 8
 3) The bond order in C_2 is 2
 4) Bond energy of H_2 is less than C-H bond
25. Which of the following statements is correct
 1) SF_6 does not react with water
 2) OF_6 is d^2sp^3 -hybridized
- 3) S_2O_3
 4) There is no π -bonding in SO_4^{2-}
26. Which of the following pairs of halogens have approximately identical bond energy ?
 1) F_2 and Br_2 2) F_2 and I_2
 3) F_2 and Cl_2 4) Cl_2 and I_2
27. Which of the following statements is/are true for BaO and MgO ?
 a) BaO is more ionic than MgO
 b) MgO is more ionic than BaO
 c) BaO has a higher melting point than MgO
 d) MgO has a higher melting point than BaO
 1) a & b 2) b & c 3) c & d 4) a & d
28. Which of the following has been arranged in order of decreasing bond length
 1) P – O > Cl – O > S – O
 2) P – O > S – O > Cl – O
 3) S – O > Cl – O > P – O
 4) Cl – O > S – O > P – O
29. The IP_1, IP_2, IP_3, IP_4 and IP_5 of an element are 7.1, 14.3, 34.5, 46.8, 162.2 eV respectively. The element is likely to be:-
 1) Na 2) Si 3) F 4) Ca
30. The number of electrons in Mn with $m = 0$ is
 1) 8 2) 13 3) 6 4) 16
31. True statement is :-
 1) All the transuranic elements are synthetic elements
 2) Elements of third group are called bridge elements
 3) Element of $1s^2$ configuration is placed in IIA group
 4) Electronic configuration of elements of a group is same
32. Which of the following represents a correct sequence of electronegativity values :-
 1) $F > N > O > C$ 2) $F > N < O > C$
 3) $F > N > C > O$ 4) $F < N < O < C$
33. Which of the following decreases in going down the halogen group
 1) Ionic radius 2) Atomic radius
 3) Ionisation potential 4) Boiling point
34. Which of the following has 2nd IP < 1st IP
 1) Mg 2) Ne 3) C 4) Na
35. Electron addition would be easier in :-
 1) O 2) O^+ 3) O^- 4) O^{+2}

KEY

1	2	2	1	3	3	4	1	5	4	6	2	7	2	8	4	9	3	10	4
11	2	12	2	13	1	14	1	15	1	16	4	17	4	18	2	19	2	20	3
21	3	22	4	23	2	24	4	25	1	26	2	27	4	28	2	29	2	30	2
31	1	32	2	33	3	34	2	35	4										

- SETTER: SRI CB -