

Chemistry [DPP]

Atomic Structure

DPP-11

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1. number of nodal planes (planes of zero electron density) in the d_{xy} orbital is
(A) 1 (B) 2
(C) 0 (D) 4
2. The number of concentric spherical surface for 3s orbital at which the probability of finding the electron is zero, are :
(A) 0 (B) 1
(C) 2 (D) 3
3. A 3p-orbital has :
(A) two non-spherical nodes
(B) two spherical nodes
(C) one spherical and one non-spherical node
(D) one spherical and two non-spherical nodes

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4. Any p-orbital can accommodate up to:
- (A) 4 electrons
 - (B) 2 electrons with parallel spins
 - (C) 6 electrons
 - (D) 2 electrons with opposite spins
5. Which orbital is dumb-bell shaped?
- (A) s-orbital
 - (B) p-orbital
 - (C) d-orbital
 - (D) f-orbital
6. The energy of an electron of $2p_y$ orbital is:
- (A) greater than $2p_x$ orbital
 - (B) less than $2p_z$ orbital
 - (C) equal to 2s orbital
 - (D) same as that of $2p_x$ and $2p_z$ orbitals

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7. The probability of finding an electron in the p_x orbital is
- (A) zero at nucleus
 - (B) the same on all the sides around nucleus
 - (C) zero on the z-axis
 - (D) maximum on the two opposite sides of the nucleus along the x-axis
8. d_z^2 orbital has:
- (A) A lobe along Z-axis and a ring along X-Y plane
 - (B) A lobe along Z-axis and a lobe along X-Y plane
 - (C) A lobe along Z-axis and a ring along Y-Z plane
 - (D) A lobe and ring along Z-axis
9. Which of the following orbitals has/have zero probability of finding the electron in xy plane:
- (A) p_z
 - (B) d_{yz}
 - (C) d_{zx}
 - (D) p_x

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- 10.** Each orbital has a nodal plane. Which of the following statements about nodal planes are not true:
- (A) A plane on which there is zero probability that the electron will be found
 - (B) A plane on which there is maximum probability that the electron will be found
 - (C) both
 - (D) none
- 11.** The maximum probability of finding an electron in the d_{xy} orbital is
- (A) along the x-axis
 - (B) along the y-axis
 - (C) at an angle of 45° from the x and y axes
 - (D) at an angle of 90°

ANSWER KEY

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|------------|---------|------------|---|-----------|---|
| 1. | B | 2. | C | 3. | C |
| 4. | D | 5. | B | 6. | D |
| 7. | A, C, D | 8. | A | 9. | A |
| 10. | B | 11. | C | | |