

VSEPR Theory

- The structure of $[Cu(H_2O)_4]^{++}$ ion is
 - Square planar
 - Tetrahedral
 - Distorted rectangle
 - Octahedral
- The bond angle in PH_3 would be expected to be close to
 - 90°
 - 105°
 - 109°
 - 120°
- In which molecule are all atoms coplanar
 - O_2^+
 - BF_3
 - PF_3
 - NH_3
- Which has the least bond angle
 - NH_3
 - BeF_2
 - H_2O
 - CH_4
- In compound X , all the bond angles are exactly $109^\circ 28'$, X is
 - Chloromethane
 - Iodoform
 - Carbon tetrachloride
 - Chloroform
- The shape of SO_4^{2-} ion is
 - Square planar
 - Tetrahedral
 - Trigonal bipyramidal
 - Hexagonal
- Which of the following molecules has one lone pair of electrons on the central atom
 - H_2O
 - NH_3
 - CH_4
 - PCl_5
- Of the following compounds, the one having a linear structure is
 - NH_2
 - CH_4
 - C_2H_2
 - H_2O
- XeF_6 is
 - Octahedral
 - Distorted octahedral
 - Planar
 - Tetrahedral
- Which has maximum bond angle
 - CHF_3
 - $CHCl_3$
 - $CHBr_3$
 - All have maximum bond angle
- Of the following species the one having a square planar structure is
 - NH_4^+
 - BF_4^-
 - XeF_4
 - SCl_4



12. In which of the following is the angle between the two covalent bonds greatest
- (a) CO_2 (b) CH_4 (c) NH_3 (d) H_2O
13. As the s-character of hybridized orbital decreases, the bond angle
- (a) Decreases (b) Increases (c) Does not change (d) Becomes zero
14. XeF_2 molecule is
- (a) Linear (b) Triangular planar (c) Pyramidal (d) Square planar
15. Of the following sets which one does NOT contain isoelectronic species
- (a) $PO_4^{3-}, SO_4^{2-}, ClO_4^-$ (b) CN^-, N_2, C_2^{2-} (c) $SO_3^{2-}, CO_3^{2-}, NO_3^-$ (d) $BO_3^{3-}, CO_3^{2-}, NO_3^-$
16. A molecule which contains unpaired electrons is
- (a) Carbon monoxide (b) Molecular nitrogen (c) Molecular oxygen (d) Hydrogen peroxide
17. H_2O is
- (a) A linear triatomic molecule (b) A bent (angular) triatomic molecule (c) Both of these (d) None of these
18. Bond angle between two hybrid orbitals is 105° . % s-orbital character of hybrid orbital is
- (a) Between 20 – 21% (b) Between 19 – 20% (c) Between 21 – 22% (d) Between 22 – 23%
19. The bond angle between N_x in ice is closest to
- (a) $120^\circ 28'$ (b) 60° (c) 90° (d) 105°
20. Which of the following molecules does not have a linear arrangement of atoms
- (a) H_2S (b) C_2H_2 (c) BeH_2 (d) CO_2

