

Molecular orbital theory

- Bond order is a concept in the molecular orbital theory. It depends on the number of electrons in the bonding and antibonding orbitals. Which of the following statements is true about it ?
The bond order
 - Can have a negative quantity
 - Has always an integral value
 - Can assume any positive or integral or fractional value including zero
 - Is a non zero quantity
- The bond order of NO molecule is
 - 1
 - 2
 - 2.5
 - 3
- When two atomic orbitals combine they form
 - One molecular orbital
 - Two molecular orbital
 - Three molecular orbital
 - Four molecular orbital
- Which of the following species is the least stable
 - O_2
 - O_2^{-2}
 - O_2^{+1}
 - O_2^{-1}
- The bond order is maximum in
 - O_2
 - O_2^{-1}
 - O_2^{+1}
 - O_2^{-2}
- Which of the following compounds of boron does not exist in the free form
 - BCl_3
 - BF_3
 - BBr_3
 - BH_3
- Molecular orbital theory was developed mainly by
 - Pauling
 - Pauling and Slater
 - Mulliken
 - Thomson
- The bond order of a molecule is given by
 - The difference between the number of electrons in bonding and antibonding orbitals
 - Total number of electrons in bonding and antibonding orbitals
 - Twice the difference between the number of electrons in bonding and antibonding electrons
 - Half the difference between the number of electrons in bonding and antibonding electrons



9. Oxygen molecule is paramagnetic because
- Bonding electrons are more than antibonding electrons
 - Contains unpaired electrons
 - Bonding electrons are less than antibonding electrons
 - Bonding electrons are equal to antibonding electrons
10. Which one is paramagnetic from the following
- O_2^-
 - NO
 - Both (a) and (b)
 - CN^-
11. The bond order in CH_3Cl ion is
- 1
 - 2
 - 2.5
 - 3
12. Out of the following which has smallest bond length
- O_2
 - O_2^+
 - O_2^-
 - O_2^{2-}
13. Which of the following molecule is paramagnetic
- Chlorine
 - Nitrogen
 - Oxygen
 - Hydrogen
14. Which molecule has the highest bond order
- N_2
 - Li_2
 - He_2
 - O_2
15. The molecular electronic configuration of H_2^- ion is
- $(\sigma 1s)^2$
 - $(\sigma 1s)^2(\sigma^* 1s)^2$
 - NO
 - $(\sigma 1s)^3$
16. The paramagnetic nature of oxygen molecule is best explained on the basis of
- Valence bond theory
 - Resonance
 - Molecular orbital theory
 - Hybridization
17. In which case the bond length is minimum between carbon and nitrogen
- CH_3NH_2
 - $C_6H_5CH=NOH$
 - CH_3CONH_2
 - CH_3CN
18. Which one of the following species is diamagnetic in nature
- He_2^+
 - H_2
 - H_2^+
 - H_2^-





19. Which one of the following oxides is expected exhibit paramagnetic behaviour

- (a) CO_2 (b) SO_2
(c) ClO_2 (d) SiO_2

20. The bond order in N_2 molecule is

- (a) 1 (b) 2
(c) 3 (d) 4

