



CHEMISTRY

BOOKS - VGS PUBLICATION-BRILLIANT

CHEMICAL BONDING AND MOLECULAR STRUCTURE

Very Short Answer Questions

1. What is octet rule ?



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2. Write Lewis dot structures for S and S^{2-} .



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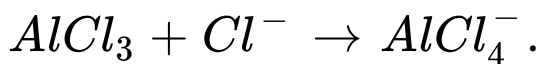
3. Write the possible resonance structures for SO_3 .



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4. Predict the change, if any, in hybridization of

Al atom in the following reaction



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5. Which of the two ions Ca^{2+} or Zn^{2+} is more stable and why?



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6. Cl^- ion is more stable than Cl atom - Why?



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7. Why argon does not form Ar_2 molecule ?



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8. What is the best possible arrangement of four bond pairs in the valence shell of an atom to minimise repulsions ?



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9. If A and B are two different atoms, when does AB molecule become covalent ?



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10. What is meant by localized orbitals ?



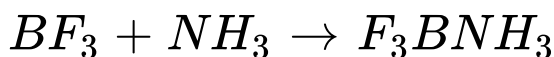
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11. How many Sigma and Pi bonds are Present in (a) C_2H_2 and (b) C_2H_4 ?



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12. Is there any change in the hybridization of Boron and Nitrogen atoms as a result of the following reaction ?



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13. Explain Kossel - Lewis approach to chemical bonding.



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Short Answer Questions

1. Write the general properties of Ionic Compounds.



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2. State Fajan's rules, and give suitable examples.



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3. What is Octet rule ? Briefly explain its significance and limitations.



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4. Write the resonance structures for NO_2 and NO_3^- .



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5. Use Lewis symbols to show electron transfer between the following pairs of atoms to form cations and anions : (a) K and S (b) Ca and O (c) Al and N.



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6. Explain why H_2O has dipole moment while CO_2 does not have.



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7. Define Dipolemoment. Write its applications.



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8. Explain why BeF_2 , molecule has zero dipolemoment although the Be-F bonds are polar.



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9. Explain the structure of CH_4 molecule.



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10. Explain Polar Covalent bond with a suitable example.



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11. Explain the shape and bond angle in BCl_3 molecule in terms of Valence Bond Theory.



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12. What are σ and π bonds ? Specify the differences between them.



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13. Even though nitrogen in ammonia is in sp^3 hybridization, the bond angle deviate from $109^\circ 28'$. Explain.



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14. Show how a double and triple bond are formed between carbon atoms in

C_2H_4 and



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15. Show how a double and triple bond are formed between carbon atoms in

C_2H_4 and



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16. Explain hybridisation of phosphorous in the formation of PCl_5



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17. Explain the hybridisation involved in SF_6 .



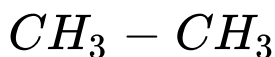
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18. Explain the formation of Coordinate Covalent bond with one example.



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19. Which hybrid orbitals are used by Carbon atoms in the following molecules ?



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20. Which hybrid orbitals are used by Carbon atoms in the following molecules ?



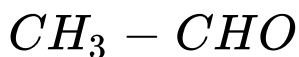
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21. Which hybrid orbitals are used by Carbon atoms in the following molecules ?



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22. Which hybrid orbitals are used by Carbon atoms in the following molecules ?



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23. Explain different types of hydrogen bonds with examples.



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24. Explain the formation H_2 molecule on the basis of Valence Bond theory.



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25. Using Molecular Orbital Theory explain why the B_2 molecule is paramagnetic ?



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26. Write the important conditions necessary for linear combination of atomic orbitals.



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27. What is meant by the term Bond order?

Calculate the bond orders in the following.

(a) N_2 (b) O_2 (c) O_2^+ and (d) O_2^-



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28. Of BF_3 and NF_3 , dipole moment is observed for NF_3 and not for BF_3 . Why?



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29. Even though both NH_3 and NF_3 are pyramidal, NH_3 has a higher dipole moment compared to NF_3 . Why?



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30. How do you predict the shapes of the following molecules making use of VSEPR theory?



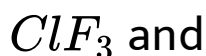
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31. How do you predict the shapes of the following molecules making use of VSEPR theory ?



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32. How do you predict the shapes of the following molecules making use of VSEPR theory ?





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33. How do you predict the shapes of the following molecules making use of VSEPR theory ?



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Long Answer Questions

1. Explain the formation of Ionic Bond with a suitable example.



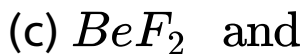
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2. Explain the factors favourable for the formation of Ionic Compounds.



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3. Draw Lewis Structures for the following molecules.



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4. Write notes on (a) Bond Angle (b) Bond Enthalpy (c) Bond length and (d) Bond order.



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5. Write about VSEPR theory.



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6. Explain the formation of BF_3 molecule with the help of Valency Bond theory.



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7. What do you understand by Hybridisation ?

Explain different types of hybridisation

involving s and p orbitals.



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8. Write the salient features of Molecular Orbital Theory.



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9. Give the Molecular Orbital Energy diagram of (a) N_2 and (b) O_2 . Calculate the respective

bond order. Write the magnetic nature of N_2 and O_2 molecules.



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