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 $AlCl_3 + Cl^- \rightarrow AlCl_4^-$.

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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 ?

$BF_3 + NH_3 \rightarrow F_3BNH_3$

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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. Wite the resonance strutures 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 dipolemoment 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 betweeen them.

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

$CH_3 - CH_3$

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

$CH_3 - CH = CH_2$

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

$CH_3 - CH_2 - OH$

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

$CH_3 - CHO$

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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 (c) O_2^-

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28. Of BF_3 and NF_3, dipolemoment 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 dipolemoment 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 ?

XeF_4

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

BrF_5

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

ClF_3 and

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

ICl_4^-

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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.

(a) H_2S (b) $SiCl_4$

(c) BeF_2 and (d) HCOOH

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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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