



INDIAN SCHOOL NIZWA - WORKSHEET

CHEMISTRY

CH 4: Chemical Bonding

Name: _____

Date: 06.11.2024

Class: XI Sec: A

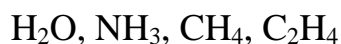
Answer the following

1. Arrange the following molecules in order of their increasing dipole moment.



2. The type of hybrid orbitals of nitrogen in NO_2^+ , NO_3^- and NH_4^+ respectively are expected to be?

3. Which of the following has maximum bond angle?



4. Write resonating structure of O_3 .

5. BF_3 has a zero dipole moment although the B-F bonds are polar. Give reason.

6. What is meant by the term bond order? Calculate the bond order of N_2 , O_2 , O_2^+ and O_2^- .

7. Compare the relative stability of the following species and their magnetic properties of O_2 , O_2^+ , O_2^- and O_2^{2-} .

8. Explain the shape of BrF_5

9. Out of CCl_4 , CHCl_3 , CH_2Cl_2 , which has zero dipole moment?

10. Why are NH_3 , glucose, and alcohol soluble in water, although they are covalent compounds?

11. Out of O_2 and N_2 molecules, which has greater bond dissociation enthalpy and why?

12. Why is HF liquid but HCl, HBr and HI are gases?

13. What is the hybrid state of

(i) B in BF_3

(ii) Al in AlCl_3

(iii) Be in BeCl_2

(iv) S in SO_2 and SO_3

14. Arrange the given bonds in increasing order of polarity: P-H, H-O, N-H, H-F.

15. Why is LiI more covalent than LiF?
16. The dipole moment of hydrogen halides decreases from HF to HI. Explain this trend.
17. Give reasons for the following
 - a) NF_3 is pyramidal while BF_3 is triangular planar.
 - b) Bond angle in water is larger than that in H_2S .
 - c) BeH_2 molecule has a zero dipole moment although the Be - H bonds are polar.
18. Discuss the shape of the following molecules using VSEPR theory.
 - a) BeCl_2 b) NH_3
19. What is resonance? Explain with examples.
20. Which bond is stronger σ or π and why?
21. What types of hybridization are involved with the central atom of molecules having following shapes?
 - a) Planar b) regular tetrahedral c) square pyramidal d) octahedral e) trigonal pyramidal
22. Molecular nitrogen is not reactive. Explain on the basis of MO theory.
23. Write the molecular orbital electronic configurations of the following species.
 - a) N_2 b) F_2^+ c) B_2 . Predict their magnetic nature and stability.
24. Distinguish between inter molecular and intra molecular hydrogen bonding with examples.
25. Why H_2O is liquid while H_2S is gas at room temperature?
26. Why boiling point of HF is greater than HCl?
27. From each of the following pairs select the molecule with higher value of property mentioned.
 - i) NH_3 , BF_3 Dipole moment ii) NF_3 , NH_3 Dipole moment
 - iii) H_2O , NH_3 Bond angle iv) HCl, HBr ionic character
28. Why PCl_5 exists but NCl_5 does not?
29. Differentiate between atomic orbital and molecular orbital.

30. In SF_4 , the lone pair of electrons occupies at the equatorial position than axial position. Why?

31. Assertion-Reason questions

- i) Both A & B are true and R is the correct explanation of A
- ii) Both A & B are true and R is not the correct explanation of A
- iii) A is true, but R is false
- iv) A is false, but R is true

1) Assertion: ClF_3 is almost T-shaped

Reason: Cl atom is surrounded by 2 lone pairs and 3 bond pairs.

2) Assertion: CO_2 molecule is non-polar in nature

Reason: Molecule of CO_2 doesn't have any polar bond.

3) Assertion: PF_5 is polar whereas IF_5 is non-polar.

Reason: Hybrid state of P in PF_5 is different from that of I in IF_5 .

4) Assertion: The dipole moment helps to predict whether a molecule is polar or non-polar.

Reason: The dipole moment helps to predict geometry.
