

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – CHEMISTRY

FIRST SEMESTER – November 2009

CH 1503 - CONCEPTS IN INORGANIC CHEMISTRY

Date & Time: 10/11/2009 / 1:00 - 4:00 Dept. No.

Max. : 100 Marks

PART – A

Answer ALL the questions.

(10 x 2 = 20 marks)

1. PbO_2 is an oxidizing agent while SnO_2 is not. Explain.
2. What is (n+l) rule? Explain it with an example.
3. Explain why CO_2 and CCl_4 molecules are non polar while CHCl_3 molecule is polar.
4. Differentiate between a sigma bond and a pi bond.
5. HF is a liquid whereas HCl, HBr and HI are gases. Why?
6. Define bond order.
7. What do you mean by tetrahedral voids?
8. What is the hybridization and geometry of IF_7 ?
9. How are acids and bases defined in terms of Lux – flood concept? Give an example.
10. What are Lewis acids? Give two examples.

PART – B

Answer any EIGHT questions.

(8 x 5 = 40 marks)

11. Lithium shows greater resemblance with magnesium than other alkali metals. Why?
12. Discuss with example the effect of inter molecular and intra molecular hydrogen bonding on boiling point of a liquid.
13. Elements A,B,C have atomic numbers 11,29,35 respectively. Write their electronic configuration and classify them as s, p and d blocks.
14. Fluorine is diamagnetic whereas oxygen molecule is paramagnetic. Explain.
15. Draw the molecular orbital energy diagram for NO molecule and find its bond order.
16. Explain zone refining and Mond's process.
17. Explain the following :
 - a. NaCl is soluble in water but BaSO_4 is not.
 - b. CsCl lattice is less stable than NaCl lattice.

18. State and explain Fajan's rule and explain the covalent character in ionic compounds.
19. Discuss the geometry of XeF_4 .
20. Explain leveling effect with two examples.
21. Discuss Usanovich concept of acid and base.
22. What are clathrates? Give its applications.

PART – C

Answer any FOUR questions.

(4 x 10 = 40 marks)

23. a) How was the term electronegativity defined by Pauling and Mulliken? (4)
- b) Discuss the factors affecting the magnitude of electronegativity. (6)
24. Define the following and explain their trends in a period and in a group (4+3+3)
- a. Ionization energy b. Electron affinity c. Atomic radius
25. a) Describe the basic features of VSEPR theory. On the basis of this theory discuss the shape of NH_3 and ICl_2^- . (8)
- b) What are the limitations of VSEPR theory? (2)
26. a) With the help of molecular orbital diagram explain why the bond order in N_2^+ ion is less stable than N_2 molecule whereas the bond order in O_2^+ is greater than oxygen molecule. (7)
- b) What are bonding and anti bonding molecular orbitals? (3)
27. What is meant by metallic bond? Illustrate the nature of metallic bond on the basis of
- a) Electron sea model b) Valence bond model c) Band model
28. a) Explain HSAB principle. (4)
- b) Discuss the following reactions in liquid ammonia as solvent (6)
- i) Acid base reaction
- ii) Ammonolysis
- iii) Precipitation reaction

