**KIIT WORLD SCHOOL**

**ASSIGNMENT**

**CLASS 12 CHEMISTRY**

**UNIT : p-block Elements**

**KNOWLEDGE BASED**

**Q1. Draw the structure of H2S2O8 and HClO4.**

**Q2. The stability of +5 oxidation state decreases down the group 15. Why ?**

**Q3. Draw the structures of XeF4  and H4P2O7.**

**Q4. State the difference in properties of white and red phosphorous.**

**Q5. Write the chemical equations involved in the preparation of the following:**

1. **XeF4**
2. **H3PO3**

**Q6. Mention three major uses of ozone.**

**Q7. Describe two allotropic forms of sulphur.**

**Q8. Draw structures of the various oxoacids of sulphur.**

**Q9. What are interhalogen compounds? How are they prepared?**

**Q10. All bonds in PCl5 are not equivalent. Why?**

**Q11. Write the balanced equations for the following:**

1. **XeF6 + 3 H2O**
2. **Cu+2  + NH3**

**Q12. Draw the structure of SO2 molecule. Comment on the nature of two S-O bonds formed in it.**

**Q13. How is ammonia manufactured industrially? Draw a flowchart for it. Give any two uses also.**

**Q14. Write the chemical equations for the following:**

1. **Chlorine reacts with hot concentrated solution of NaOH**
2. **Orthophosphorous acid is heated**
3. **PtF6 and xenon are mixed together.**

**Q15. Describe the Mond process and van Arkel method of refining with suitable equations.**

**Q16. Answer the following:**

1. **Describe the favourable conditions for the manufacture of ammonia.**
2. **Describe the contact process with diagram.**

**UNDERSTANDING BASED**

**Q17. Why does the basic nature of the hydroxides of the alkali metals increase down the group?**

**Q18. What happens when XeF4 undergoes hydrolysis?**

**Q19. Thermal stability of water is much higher than that of H2S. Why?**

**Q20. Fluorine exhibits only -1 oxidation state in its compounds whereas other halogens exhibit many other oxidation states. Why?**

**Q21. In which of the two structures, NO2+ and NO2- , the bond angle has a higher value?**

**Q22. Why does sulphur in vapour state exhibits a paramagnetic behaviour?**

**Q23. Why do some noble gases form compounds with fluorine and oxygen only?**

**Q24. Nitrogen does not form any pentahalide like phosphorous. Why?**

**Q25. Why is the bond angle in PH3 molecule lesser than that in NH3 molecule?**

**Q26. Why does NO2 dimerise ?**

**Q27. Why is Bi(V) a stronger oxidant than Sb(V) ?**

**Q28. Give reasons for the following:**

1. **SiF62- is known but SiCl62- is not known.**
2. **PbO2 is a stronger oxidising agent than SnO2.**
3. **H3PO2 acts as a monobasic acid**
4. **Bond dissociation energy of F2is less than that of Cl2**

**Q29. Justify the following statements:**

1. **Halogens are coloured.**
2. **Fluorine forms only one oxoacid HOF.**
3. **Phosphorous forms PCl5 but nitrogen does not form NCl5.**
4. **Helium is used in diving apparatus.**
5. **Noble gases have low boiling points.**

**Q30. Arrange the following in the order of increasing base strength:**

1. **NH3, SbH3, PH3 BiH3, AsH3**
2. **Give reason for the order also**

**Q31. Justify the following statements:**

1. **SiF6-2is known but SiCl6-2 is not known.**
2. **Sulphur in vapour state exhibits paramagnetic behaviour.**
3. **PbO2 is a stronger oxidizing agent than SnO2.**
4. **H3PO2 acts as a monobasic acid.**
5. **Bond dissociation energy of F2 is less than that of Cl2**

**APPLICATION/SKILL**

**Q32. Why is HF not stored in plain glass bottles?**

**Q33. Nitric oxide becomes brown when released in air. Why?**

**Q34. Why does PCl3 fume in moisture? Give its reaction.**

**Q35. Fluorine does not exhibit any positive oxidation state. Why ?**

**Q36. Answer the following:**

1. **How is sulphur dioxide prepared in lab and industrially?**
2. **What happens when SO2 is passed through water and reacts with NaOH. Write balanced equation.**
3. **Write any two uses of SO2**

**Q37. Assign a reason for the following :**

1. **Phosphorous shows a marked tendency for catenation but nitrogen shows little tendency for catenation.**
2. **The electron gain enthalpy with negative sign for oxygen (-141 kJ mol-1) is less than that for sulphur (-200 kJ mol-1)**

**Q38. Explain the following situations:**

1. **In the structure of HNO3 molecule, the N-O bond is shorter than N-OH bond.**
2. **SF4 is easily hydrolysed whereas SF6 is not.**
3. **XeF2 has a straight linear structure and not a bent angular structure.**

**HOTS**

**Q39. A floweriest bleached some of the flowers for decorative purposes. He bleached some flowers with Cl2 while some with SO2. He found out the flowers bleached with Chlorine were permanent while the ones bleached with SO2 were temporary. What could be the possible reason for this?**

**Q40. Ravi was performing an experiment in the lab. He found out a list where it was given that PH3 has a boiling point of 185K while ammonia has a boiling point of 240K. What could be the possible reason for low boiling point of phosphine.**

**VBQ**

**Q41. A bottle containing anesthesia was left on the window side of the operation theatre for a few days. The contents of the same bottle was used on one of his patients and found that the patient having severe vomiting and stomach poisoning.**

**i) Identify the compound. Give relevant equation for the action of sunlight on it.**

**ii) What is the moral behind this incident?**

**Q42. In an arc welding industry of metals and alloys, a gas from group 18 family is used in the metallurgical process.**

**After reading the above statement, answer the following:**

1. **As a student of chemistry, which gas is used for such process? Give reasons.**
2. **What are the values associated with the nature of the gas?**

**Q43. In a biology laboratory, scientists need a refrigerator for storing biological specimens. They had two options- one where a cold storage unit can be made and other where liquid dinitrogen could be used as a refrigerant.**

**After reading the above passage, answer the following:**

1. **As a student of chemistry, what would you suggest to use so that the specimens are preserved for a longer period? Give reasons.**
2. **What are the values associated with the above decision?**

**Q44. Manu went on a holiday in a cruise. Suddenly, due to the collapse of lower deck, the cruise began to sink. Manu immediately used the Holme’s signal in order to seek help.**

**After reading the above passage, answer the following:**

1. **Describe the chemistry involved behind the generation of this Holme’s signal and the chemicals involved in it.**
2. **What values are displayed by Manu from this act**

**ATTEMPT ALL INTEXT AND BACK EXERCISE QUESTIONS OF NCERT**