

## ASSIGNMENT ON GROUP 16 ELEMENTS FROM THE CHAPTER "The p block Elements"

- Q.1. Write the general configuration of group 16 elements.
- Q.2. First IE of group 16 elements are lower than the corresponding elements of group 15 despite their smaller atomic radii. Explain why.
- Q.3. Give reasons for the anomalous behaviour of oxygen.
- Q.4. Why does the acidic character of the hydrides of group 16 elements increase down the group?
- Q.5. Name the two most important allotropes of sulphur. Which one of the two is stable at room temperature? What happens when the stable form is heated above 370K?
- Q.6. Write the conditions to maximise the yield of  $\text{H}_2\text{SO}_4$  by Contact Process.
- Q.7. Why is the value of  $K_{a1}$  much higher than  $K_{a2}$  for  $\text{H}_2\text{SO}_4$  ?
- Q.8. Why does the reducing character decrease from  $\text{SO}_2$  to  $\text{TeO}_2$ ?
- Q.9. What is the hybridisation and geometry of selenium tetrafluoride? What is the shape of the molecule and why?
- Q.10. Give reasons for the following:
- Boiling point of water is higher than that of  $\text{H}_2\text{S}$ .
  - $\text{SO}_2$  is reducing agent while  $\text{TeO}_2$  is an oxidising agent.
  - $\text{SO}_2$  acts as an air pollutant.
  - Fluorine is a stronger oxidising agent than chlorine (consider the parameters of BDE, electron gain Enthalpy and hydration enthalpy)
  - Water is a liquid but  $\text{H}_2\text{S}$  is a gas.
  - Ozone acts as a powerful oxidising agent.
  - The two O-O bond lengths in ozone are equal.
  - Sulphur has a greater tendency for catenation than oxygen.
  - $\text{SF}_4$  is easily hydrolysed whereas  $\text{SF}_6$  is not.
  - Oxygen generally exhibits an oxidation state of -2 only whereas other members of its family show oxidation states of +2, +4 and +6 as well.
  - O-O bond has lower bond dissociation enthalpy than S-S bond.
  - Sulphur in vapour state exhibits paramagnetism.
  - Conc.  $\text{H}_2\text{SO}_4$  is used as a dehydrating agent.
- Q.11. Explain why ozone is thermodynamically less stable than oxygen.
- Q.12. Draw the structures of the following oxo acids of sulphur....Sulphurous acid, Sulphuric acid, Peroxodisulphuric acid.