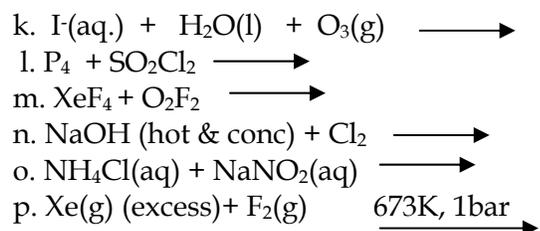


## Assignment

### Chapter 7: p -Block Elements

1. Assign appropriate reason for each of the following observations:
  - a)  $\text{SbF}_5$  is more stable than  $\text{BiF}_5$  .
  - b) Sulphur in vapour state exhibits some paramagnetic behaviour.
  - c)  $\text{H}_2\text{O}$  is a liquid but  $\text{H}_2\text{S}$  is a gas.
  - d)  $\text{NH}_3$  is stronger base than phosphine.
  - e) Hydrogen bonding in Hydrogen fluoride is much stronger than that in water, yet water has much higher boiling point.
  - f) The majority of known noble gas compounds are those of Xenon.
  - g) Halogens are strong oxidants.
  - h) The value of electron gain enthalpy with negative sign for sulphur is higher than that for oxygen.
  - i)  $\text{ClF}_3$  molecule has a T-shaped structure and not a trigonal planar one.
  - j)  $\text{O}_2$  and  $\text{F}_2$  both stabilize higher oxidation states of metals but  $\text{O}_2$  exceeds  $\text{F}_2$  in doing so.
  - k) Structures of xenon fluorides cannot be explained by Valence Bond Approach.
  - l) The chemical reactivity of nitrogen is much less than that of phosphorus.
  - m)  $\text{SF}_6$  is kinetically inert.
  - n) All the bonds in  $\text{SF}_4$  are not equivalent..
  - o)  $\text{ICl}$  is more reactive than  $\text{I}_2$ .
  - p) Despite lower value of its electron gain enthalpy with negative sign,  $\text{F}_2$  is a stronger oxidizing agent than  $\text{Cl}_2$ .
  - q) Bond enthalpy of  $\text{F}_2$  is lower than that of  $\text{Cl}_2$ .
  - r)  $\text{PH}_3$  has a lower boiling point than  $\text{NH}_3$ .
  
2. a) Write the reaction of preparation of  $\text{XeF}_4$ ,  $\text{XeF}_6$ ,  $\text{XeO}_3$   
b) What happens when (i)  $\text{PCl}_5$  is heated  
(ii)  $\text{H}_3\text{PO}_3$  is heated
  
3. Draw the structures of the following:  
a)  $\text{XeF}_2$     b).  $\text{XeF}_4$     c)  $\text{XeOF}_4$     d)  $\text{BrF}_3$     e)  $\text{XeO}_3$     f)  $\text{XeOF}_4$     g)  $\text{SF}_4$   
h)  $\text{H}_3\text{PO}_2$     i)  $\text{H}_2\text{SO}_5$     j)  $\text{N}_2\text{O}_5$     k)  $\text{H}_2\text{S}_2\text{O}_7$     l)  $\text{H}_3\text{PO}_3$     m)  $(\text{HPO}_3)_3$     n)  $\text{H}_2\text{S}_2\text{O}_8$
  
4. Complete the equations:
  - a.  $\text{XeF}_6 + \text{H}_2\text{O} \rightarrow$
  - b.  $\text{XeF}_2 + \text{PF}_5 \rightarrow$
  - c.  $\text{HNO}_3 + \text{P}_4\text{O}_{10} \rightarrow$
  - d.  $\text{Ca}_3\text{P}_2 + \text{H}_2\text{O} \rightarrow$
  - e.  $\text{Cl}_2 + \text{NaOH}$  ( cold and dil.)  $\rightarrow$
  - f.  $\text{Pb}(\text{NO}_3)_2 \xrightarrow{675\text{K}}$
  - g.  $\text{Pb}_3\text{O}_4 + \text{HNO}_3 \rightarrow$
  - h.  $\text{Cu}^{2+}(\text{aq.}) + \text{NH}_3(\text{aq.})$  (excess)  $\longrightarrow$ 
    - i.  $\text{F}_2(\text{g}) + \text{H}_2\text{O}(\text{l}) \longrightarrow$
    - j.  $\text{P}_4(\text{s}) + \text{NaOH}(\text{aq.}) + \text{H}_2\text{O}(\text{l}) \longrightarrow$



5. How is ammonia manufactured industrially?
6. How is  $\text{SO}_2$  an air pollutant?
7. Write balanced chemical equation for the reaction of  $\text{NaCl}$  with sulphuric acid in the presence of  $\text{MnO}_2$
8. Draw the structures of white phosphorus and red phosphorus. Which one of these two types of phosphorus is more reactive and why?
9. Which one of  $\text{PCl}_4^+$  and  $\text{PCl}_4^-$  is not likely to exist to exist and why?
10. Predict the shape and the asked angle ( $90^\circ$  or more or less) in each of the following cases: (a)  $\text{SO}_3^{2-}$  and the angle O-S-O.  
 (b)  $\text{XeF}_2$  and the angle F-Xe-F.

