

## Holiday Homework

CLASS-XI

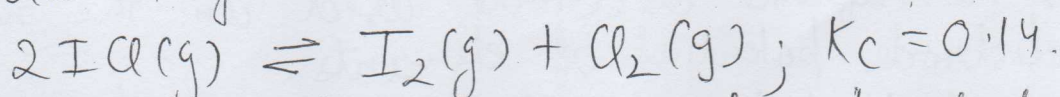
SUBJECT-CHEMISTRY

- Balance the following redox reactions by ion-electron method / Half reaction method.
  - $\text{Cr}_2\text{O}_7^{2-} + \text{SO}_2(\text{g}) \longrightarrow \text{Cr}^{3+}(\text{aq}) + \text{SO}_4^{2-}$  (in acidic medium)
  - $\text{MnO}_4^- + \text{I}^- \longrightarrow \text{MnO}_2 + \text{I}_2$  (Basic medium).
- What is disproportionation reaction? Give one example.
- Name the reference electrode used in the measurement of electrode potential of elements.
- Differentiate between temporary and permanent hardness of water.
- Write the various reactions that occur in the Solvay process.
- Starting with NaCl how would you proceed to prepare
  - Na metal
  - NaOH
  - $\text{Na}_2\text{CO}_3$ .
- What is inert pair effect?
- What are silicones? How they can be prepared? Write two applications of silicones.
- Complete the following reactions'.
  - $\text{B}_2\text{H}_6 + \text{H}_2\text{O} \longrightarrow$
  - $\text{B}_2\text{H}_6 + \text{NH}_3 \xrightarrow{\Delta}$
  - $\text{Na}_2\text{B}_4\text{O}_7 + \text{H}_2\text{O} \longrightarrow$
  - $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O} \xrightarrow{\Delta} \text{A} \xrightarrow{\Delta} \text{B}$ .
  - $\text{SiO}_2 + 4\text{HF} \longrightarrow$
- Write reactions to justify amphoteric nature of Aluminium.

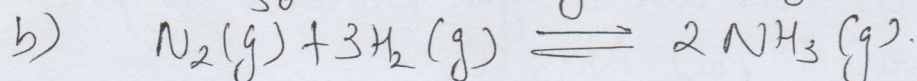
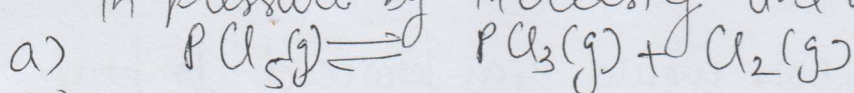
11. a) Find the value of  $K_c$  for the following equilibria  
 $2\text{NOCl}(g) \rightleftharpoons 2\text{NO}(g) + \text{Cl}_2(g)$ ;  $K_p = 1.8 \times 10^{-2}$  atm at 500 Kelvin.

b) For the following equilibrium,  $\text{NO}(g) + \text{O}_3 \rightarrow \text{NO}_2(g) + \text{O}_2(g)$   
 $K = 6.3 \times 10^{14}$  at 1000K. What is the  $K_c$  for the reverse reaction?

12. What is the equilibrium concentration of each of the substances in the equilibrium when the initial concentration of  $\text{I}_2$  was 0.78M?



13. Does the number of moles of reaction products increase, decrease or remain same when each of the following equilibria is subjected to a decrease in pressure by increasing the volume.



14. Define the following terms: a) Le-Chatelier's principle.  
 b) Buffer solution c) Common ion effect.

15. Find the conjugate acid/base for the following species  
 $\text{HNO}_2$ ,  $\text{CH}^-$ ,  $\text{HClO}_4$ ,  $\text{OH}^-$ ,  $\text{CO}_3^{2-}$ ,  $\text{S}^{2-}$

16. Calculate the pH of the resultant mixture  
 10mL of 0.1M  $\text{H}_2\text{SO}_4$  + 10mL of 0.1M  $\text{KOH}$ .

17. Determine the solubilities of silver chromate ( $\text{Ag}_2\text{CrO}_4$ ) and Lead chloride ( $\text{PbCl}_2$ ) at 298K from their solubility product constants given in Table 7.9 (page 221).