SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

17th Group

1. When F_2 reacts with hot and conc. Alkali, then following will be obtained :

a) OF_2 b) O_2 c) H_2O d) NaF

2. Which pair gives Cl_2 at room temperature ?

a) Conc.HCl+$KMnO_4$ b) $NaCl + Conc.H_2SO_4$

c) $NaCl + MnO_2$ d) $NaCl + Conc.HNO_3$

3. Which reaction is possible ?

a) $I_2 + 2NaBr \rightarrow Br_2 + 2NaI$ b) $I_2 + 2NaCl \rightarrow Cl_2 + 2NaI$

c) $Br_2 + 2NaCl \rightarrow Cl_2 + 2NaBr$ c) $Cl_2 + 2NaBr \rightarrow Br_2 + 2NaCl$

4. Tincture of iodine is :

a) I_2, KI and rectified spirit and water b) I_2 and rectified spirit

c) KI and rectified spirit d) I_2 and water

5. Among the following reactions, in which of the following a blue complex will be formed when starch solution is added ?

1) When chlorine is passed through NaI

2) Sodium iodate is treated with sodium bisulphite solution

3) KI is treated with MnO_2 and conc. H_2SO_4

4) $CuSO_4$ solution is added in KI solution

5) KI is added to bleaching powder containing dilute acetic acid

a) 1,3 b) 1,3,4,5 c) 2,3,4 d) all of these

6. In which case, the order of acidic strength is not correct ?

a) $HI > HBr > HCl$ b) $HIO_4 > HBrO_4 > HClO_4$

c) $HClO_4 > HClO_3 > HClO_2$ d) $HF > H_2O > NH_3$

7. Thermally most stable compound is :

a) $HOClO_3$ b) $HOClO_2$. c) HOCl d) HOClO

8. Which of the following halogen disproportionate in water

a) F_2 b) Cl_2 c) I_2 d) All of these

9. Which of the following is correct statement

a) F_2 has higher dissociation energy then Cl_2 b) F has higher electron affinity then A*l*

c) HF is stranger acid then HCl d) Boiling point increases down the group in halogens

10. Which anion can undergo both oxidation and reduction ?

a) $Cr_2O_7^{2-}$ b) NO_3^- c) OCl^- d) S^{2-}

11. Consider the oxy acids $HClO_n$ series , here value of n is 1 to 4, then incorrect statement regarding these oxy acids is :

a)Acidic character of oxy acids increase with in increasing value of n

b) Oxidising power of oxy acids increases with decreasing value of n

c)Thermal stability of oxy acids decreases with increasing value of n

d) 'Cl-o' bond order decreases with decreasing value of n

12. Bromine is commercially prepared from sea water by displacement reaction $Cl_2 + 2Br^-_{(aq)} \rightarrow 2Cl^-_{(aq)} + Br_2$. Br_2 gas thus formed is dissolved into solution of Na_2CO_3 and then pure Br_2 is obtained by treatment of the solution with :

a) $Ca(OH)_2$ b) $NaOH$ c) H_2SO_4 d) HI

13. Which of the following properties of halogens increase with increasing atomic number ?

a) Ionization energy b) Ionic radius

c) Bond energy of the x_2 molecule d) Enthalpy of vaporisation

a) 1,2,3 b) 1,3 c) 2,4 d) 4

14. $Cl_2(g) + Ba(OH)_2 \rightarrow x_{(aq)} + BaCl_2 + H_2O$

$X + H_2SO_4 \rightarrow y + BaSO_4$

$y \xrightarrow[\Delta > 365k]{\Delta} z + H_2O + O_2$. y and z are respectively.

a) $HClO_4, ClO_2$ b) $HClO_3, ClO_2$ c) $HClO_3, ClO_6$ d) $HClO_4, Cl_2O$

15. The incorrect order is :

a) $HF < HCl < HBr < HI$: Acidic strength

b) $HF < HCl < HBr > HI$: Thermal stability

c) $HF > HCl > HBr > HI$: Boiling point

d) $HF > HCl > HBr > HI$: Bond dissociation enthalpy

Numerical

16. For oxyacid $HClO_x$, If x = y = z (x, y and z are natural numbers), then calculate the value of |x + y + z|. Where x = number of 'O' atoms.

y = total number of lone pairs at central atom.

z = total number of Pi (π) electrons in the oxyacid.

17. How many moles of given compound are decomposed in the following decomposition in the following decomposition reaction? $NaCl \xrightarrow{\Delta} NaClO_3 + NaCl$

18. What is covalence of chlorine atom in second exited state ?

KEY SHEET

1) **c**	2) **a**	3) **d**	4) **a**	5) **d**	6) **b**	7) **a**	8) **b**	9) **d**	10) **c**
11) **c**	12) **c**	13) **c**	14) **b**	15) **c**	16) **6**	17) **3**	18) **5**		

HINTS

1. Conceptual
2. Conceptual
3. Conceptual
4. Conceptual
5. a) $Cl_2 + NaI \rightarrow 2NaCl + I_2$

   b) $2NaIO_3 + 5NaHSO_3 \rightarrow 3NaHSO_4 + 2Na_2SO_4 + H_2O + I_2$

   c) $2KI + MnO_2 + 3H_2SO_4 \rightarrow 2KHSO_4 + MnSO_4 + 2H_2O + I_2$

   d) $2MSO_4 + 4KI \rightarrow 2K_2SO_4 + Cu_2I_2 + I_2$
6. $HClO_4 > HBrO_4 > HIO_4 \Rightarrow$ acidic strength has been decided on the basis of electron negativity or charge density on central atom.

7. Decreasing order of thermal stability of oxy acids of chlorine.

$HClO_3; HOClO_2; HOClO; HOCl$

In $HClO_3$, chlorine is in +7 oxidation state.

8. Conceptual

9. a) –bond dissociation energy of F_2 is less than that of Cl_2

b) –a has higher E.A. than fluorine

c) HF is weaker acid than HCl, due to higher bond energy

10. Conceptual

11. Acidic character : $HOCl < HClO_2 < HClO_3 < HClO_4$

Oxidising power : $HOCl > HClO_2 > HClO_3 > HClO_4$

Thermal stability : $HOCl < HClO_2 < HClO_3 < HClO_4$

' a-o' bond reducer : $HOCl < HClO_2 < HClO_3 < HClO_4$

12. $3Br_2 + 3Na_2CO_3 \rightarrow 5NaBr + NaBrO_3 + 3CO_2 \uparrow \xrightarrow{\Delta H_2SO_4} 3Br_2 \uparrow + Na_2So_4$

(impure) (Hot aq.sol.) (Pure)

13. Conceptual

14. $6Cl_2 + 2Ba(OH)_2 \rightarrow \underset{X}{Ba(ClO_3)_2} + 5BaCl_2 + 6H_2O$

$Ba(ClO_3)_2 + H_2SO_4 \rightarrow \underset{(Y)}{2HClO_3} + BaSO_4 \downarrow$

$HClO_3 \xrightarrow[\Delta > 365k]{\Delta} 2ClO_2 + H_2O + \frac{1}{2}O_2$

15. Correct order p.bt

$Hf > HI > HBr > HCl$

$Dipole - dipole\ attraction\ (v.w.forces)$

In case of same type of Vander wales force of attraction b.pt $\propto$ molecular mass.

16. $HClO_2$

$x = y = z = 2$

$x + y + z = 6$

17. Conceptual

18. Conceptual