



## SR – CHE - VII GROUP ELEMENTS - DPT

- HCl is dried using \_\_\_\_\_,  $\text{NH}_3$  is dried using \_\_\_\_\_  
 1. CaO, CaO                      2.  $\text{H}_2\text{SO}_4$ ,  $\text{H}_2\text{SO}_4$                       3.  $\text{H}_2\text{SO}_4$ , CaO                      4.  $\text{H}_2\text{SO}_4$ ,  $\text{P}_2\text{O}_5$
- The gaseous mixture liberated when  $\text{NaNO}_2$  is treated with HCl is  
 1)  $\text{NO} + \text{N}_2\text{O}$                       2)  $\text{NO} + \text{NO}_2$                       3)  $\text{N}_2\text{O} + \text{NO}_2$                       4)  $\text{N}_2 + \text{NO}$
- Which of the following is most reactive?  
 1)  $\text{I}_2$                       2)  $\text{Cl}_2$                       3)  $\text{ICl}$                       4) all are equally reactive
- Wrong statement is  
 1)  $\text{I}_2\text{O}_5$  is used to estimate oxygen in organic compound  
 2) Chlorine reacts with excess Ammonia to liberate nitrogen gas  
 3) HCl is dried by passing through conc.  $\text{H}_2\text{SO}_4$   
 4) HOF cannot exist
- Charring takes place when  $\text{Cl}_2$  is exposed to  
 1)  $\text{H}_2\text{S}$                       2)  $\text{C}_{10}\text{H}_{16}$                       3)  $\text{S}_8$                       4)  $\text{P}_4$
- |   |   |    |     |     |    |    |   |   |   |   |    |   |   |   |   |  |  |   |    |     |    |    |   |   |   |   |    |   |   |   |   |
|---|---|----|-----|-----|----|----|---|---|---|---|----|---|---|---|---|--|--|---|----|-----|----|----|---|---|---|---|----|---|---|---|---|
| <p><i>List - I</i></p> <p>I) Acidic nature<br/>           II) Reducing nature<br/>           III) Boiling points<br/>           IV) Volatility</p> <p>The correct match is</p> <table border="0"> <tr> <td></td> <td>I</td> <td>II</td> <td>III</td> <td>IV</td> </tr> <tr> <td>1)</td> <td>a</td> <td>b</td> <td>c</td> <td>d</td> </tr> <tr> <td>3)</td> <td>d</td> <td>c</td> <td>a</td> <td>b</td> </tr> </table> |   | I  | II  | III | IV | 1) | a | b | c | d | 3) | d | c | a | b | <p><i>List - II</i></p> <p>a) <math>\text{HF} &gt; \text{HI} &gt; \text{HBr} &gt; \text{HCl}</math><br/>           b) <math>\text{HI} &gt; \text{HBr} &gt; \text{HCl} &gt; \text{HF}</math><br/>           c) <math>\text{HCl} &gt; \text{HBr} &gt; \text{HI} &gt; \text{HF}</math><br/>           d) <math>\text{HCl} &gt; \text{HF} &gt; \text{HBr} &gt; \text{HI}</math></p> <table border="0"> <tr> <td></td> <td>I</td> <td>II</td> <td>III</td> <td>IV</td> </tr> <tr> <td>2)</td> <td>b</td> <td>d</td> <td>a</td> <td>c</td> </tr> <tr> <td>4)</td> <td>b</td> <td>b</td> <td>a</td> <td>c</td> </tr> </table> |  | I | II | III | IV | 2) | b | d | a | c | 4) | b | b | a | c |
|   | I | II | III | IV  |    |    |   |   |   |   |    |   |   |   |   |  |  |   |    |     |    |    |   |   |   |   |    |   |   |   |   |
| 1)  | a | b  | c   | d   |    |    |   |   |   |   |    |   |   |   |   |  |  |   |    |     |    |    |   |   |   |   |    |   |   |   |   |
| 3)  | d | c  | a   | b   |    |    |   |   |   |   |    |   |   |   |   |  |  |   |    |     |    |    |   |   |   |   |    |   |   |   |   |
|   | I | II | III | IV  |    |    |   |   |   |   |    |   |   |   |   |  |  |   |    |     |    |    |   |   |   |   |    |   |   |   |   |
| 2)  | b | d  | a   | c   |    |    |   |   |   |   |    |   |   |   |   |  |  |   |    |     |    |    |   |   |   |   |    |   |   |   |   |
| 4)  | b | b  | a   | c   |    |    |   |   |   |   |    |   |   |   |   |  |  |   |    |     |    |    |   |   |   |   |    |   |   |   |   |
- Incorrect combination is  
 1)  $\text{Br}_2\text{O}$ ,  $\text{BrO}_2$ ,  $\text{BrO}_3$  -unstable                      2)  $\text{CuCl}_2$  -catalyst in Deacon's process  
 3)  $\text{Cl}_2$  -Oxidises  $\text{H}_2\text{S}$  to  $\text{SCl}_6$                       4) IF – highly unstable
- Matching the following  

<p><i>List – I</i></p> <p>Inter halogen compound</p> <p>A) <math>\text{XX}^1</math>            B) <math>\text{XX}_3^1</math>            C) <math>\text{XX}_5^1</math>            D) <math>\text{XX}_7^1</math></p>	<p><i>List – II</i></p> <p>Product of hydrolysis</p> <p>1) halite            2) perhalate            3) hypohalite            4) halate</p>
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1) A – 2, B – 3, C – 1, D – 4	2) A – 1, B – 4, C – 2, D – 3
3) A – 3, B – 1, C – 4, D – 2	4) A – 4, B – 2, C – 3, D – 1
- The molecule  $\text{ClF}_3$  has same number of lone pairs of electrons as present in  
 1)  $\text{SF}_4$                       2)  $\text{XeF}_2$                       3)  $\text{IF}_5$                       4)  $\text{XeF}_4$
- Incorrect statement is  
 1)  $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$  – reactivity                      2)  $\text{Cl} > \text{F} > \text{Br} > \text{I}$  – electron gain enthalpy  
 3)  $\text{F}_2 > \text{ClF}_3 > \text{Cl}_2$  – reactivity                      4)  $\text{F}_2 > \text{Cl}_2 > \text{Br}_2 > \text{I}_2$  – bond dissociation energy
- $\text{Cl}_2 + 2\text{KX} \rightarrow 2\text{KCl} + \text{X}_2$ . In this reaction 'X' can be  
 1) Br, I                      2) Br, F                      3) F                      4) I, F
- In which of the following reactions precipitate is not obtained  
 1)  $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow \text{Products}$                       2)  $\text{Na}_2\text{S}_2\text{O}_3 + \text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{Products}$

- 3)  $I^- + H^+ + O_2 \rightarrow \text{Products}$       4)  $PCl_5 + H_2O \rightarrow \text{Products}$
13.  $HCl + O_2 \xrightarrow{CuCl_2} A(\text{gas})$ ; Excess 'A' reacts with  $NH_3$  to form  
 A)  $NCl_3$     B)  $NH_4Cl$     C)  $HCl$     D)  $N_2$   
 1) A, D      2) B, C      3) A, B      4) A, C
14. Increasing order of  $P^{K_a}$  values among hydrohalic acids  
 1)  $HI < HBr < HCl < HF$     2)  $HF < HCl < HBr < HI$   
 3)  $HBr < HI < HF < HCl$     4)  $HCl < HF < HI < HBr$
15. Match the following  
 Set – I (Compounds)    Set – II (Excited state of Halogen)  
 P)  $Cl_2O_7$                       A) 1<sup>st</sup>  
 Q)  $Cl_2O$                         B) 2<sup>nd</sup>  
 R)  $I_2O_5$                         C) 3<sup>rd</sup>  
 S)  $ClF_3$                         D) 4<sup>th</sup>  
 E) ground
- |      |   |   |   |      |   |   |   |
|------|---|---|---|------|---|---|---|
| P    | Q | R | S | P    | Q | R | S |
| 1) C | E | B | A | 2) B | E | C | A |
| 3) E | B | C | A | 4) A | B | C | D |
16.  $R-Cl + AgF \rightarrow R-F + AgCl$  is  
 1) Swart's reaction    2) Finkelstein reaction    3) Grove's reaction    4) Dow's reaction
17. To remove Plutonium from spent nuclear fuel, the compound used is  
 1.  $OF_2$                       2.  $O_2F_2$                       3.  $Cl_2$                       4.  $I_2$
18. The metallic fluoride not used in Swart's reaction is  
 1)  $AgF$                       2)  $CaF_2$                       3)  $Hg_2F_2$                       4)  $SbF_3$
19. The ratio of number of  $d-p\pi$  bonds in  $HC\ell O_2$ ,  $HC\ell O_3$  and  $HC\ell O_4$  are  
 1) 1:2:3                      2) 1:1:1                      3) 3:2:1                      4) 1:2:4
20. Hypochlorite disproportionate to give  
 1)  $ClO_2^-$  and  $ClO_4^-$     2)  $ClO_4^-$  and  $ClO_3^-$     3)  $ClO_3^-$  and  $Cl^-$     4)  $ClO_2^-$  and  $ClO_3^-$
21. Sum of the total number lone pairs on the central atom of  $Cl$  in  $HOCl$ ,  $HClO_2$ ,  $HClO_3$ ,  $HClO_4$
22.  $Fe + 2HCl \longrightarrow X + H_2 \uparrow$  the no. of d electron of  $Fe^{+n}$  is X is
23. The basicity of  $HClO_4$  is 'X' what is the value of X
24. How many no. of hybrid orbitals of chlorine are present in  $ClO_4^-$
25. How many of the following are paramagnetic nature  $Cl_2O$ ,  $ClO_2$ ,  $ClO_3$ ,  $Cl_2O_6$ ,  $Cl_2O_7$
26. How many of the following do not react with dilute  $HCl$ ,  
 $Cu$ ,  $Ag$ ,  $Na_2CO_3$ ,  $NaHCO_3$ ,  $Na_2HPO_4$ ,  $Na_3PO_4$ ,  $Mg$ ,  $K$ ,  $KHO_2$ ,  $KH_2PO_3$ ,  $NH_4KCl$
27. Chlorine form many oxides, the maximum oxidation state of the chlorine in its oxide
28.  $XCl_2 + Y NaOH \longrightarrow NaCl + NaClO_3 + H_2O$  . what is the ratio of the Y to that of X
29.  $NH_3$  react with  $Cl_2$  to  $N_2$  gas? How many number of  $Cl_2$  are required
30. Some halogens show +7 oxidation state in its excited state of configuration. What is excited state

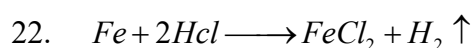
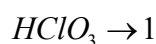
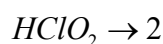
### KEY

1) 3	2) 2	3) 3	4) 4	5) 2	6) 4	7) 3	8) 3	9) 4	10) 4
11) 1	12) 4	13) 4	14) 1	15) 1	16) 1	17) 2	18) 2	19) 1	20) 3
21) 6	22) 6	23) 1	24) 4	25) 2	26) 3	27) 7	28) 2	29) 3	30) 3

### SOLUTION

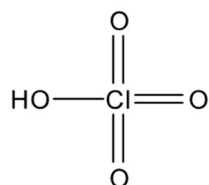
- HCl is dried using  $H_2SO_4$ ,  $NH_3$  is dried using  $CaO$
- The gaseous mixture liberated when  $NaNO_2$  is treated with  $HCl$  is  $NO + NO_2$

3.  $ICl$  is most reactive
4.  $HOF$  cannot exist
5. Charring takes place when  $Cl_2$  is exposed to  $C_{10}H_{16}$
7.  $S + 3Cl_2 \rightarrow SCl_6$
9. The molecule  $ClF_3$  has same number of lone pairs of electrons as present in  $XeF_4$
10.  $Cl_2 > Br_2 > F_2 > I_2$  - bond dissociation energy
11.  $Cl_2 + 2KX \rightarrow 2KCl + X_2$ . In this reaction 'X' can be Br, I
12.  $PCl_5 + H_2O \rightarrow$  Products reactions precipitate is not obtained
13.  $HCl + O_2 \xrightarrow{CuCl_2} NCl_3 + HCl(gas)$
14.  $HI < HBr < HCl < HF$
16.  $R-Cl + AgF \rightarrow R-F + AgCl$  is Swart's reaction
17. To remove Plutonium from spent nuclear fuel, the compound used is  $O_2F_2$
18. The metallic fluoride not used in Swart's reaction is  $CaF_2$
19. The ratio of number of  $d-p\pi$  bonds in  $HClO_2$ ,  $HClO_3$  and  $HClO_4$  are 1 : 2 : 3
20. Hypochlorite disproportionate to give  $ClO_3^-$  and  $Cl^-$
- 21.

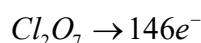
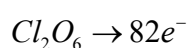
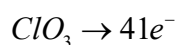
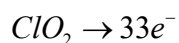
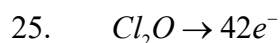
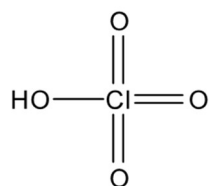


$Fe^{+2}$  contains 6 d electrons

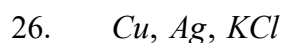
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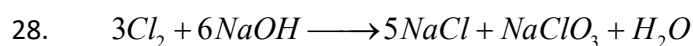
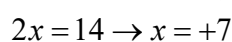
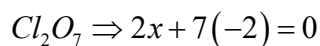
24.  $sp^3$  hybridisation



Paramagnetic are  $ClO_2$  and  $ClO_3$



27.



$$x = 3, y = 6$$

$$\frac{y}{x} = \frac{6}{3} = 2$$

