CHEMISTRY

BOOKS - ARIHANT PUBLICATION

GROUP 17 ELEMENTS : HALOGEN FAMILY

Questions For Practice Multiple Choice Type Questions

1. Which has highest electron affinity?

A. Fluorine

B. Chlorine

C. Bromine

D. Iodine

Answer: B

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2. Choose the correct order of electron affinity from the following.

A. $F > Cl > Br$

B. $F < Cl < Br$

C. $F > Cl < Br$

D. $F < Cl > Br$

Answer: D

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3. In the halogen family, the oxidising action increases in the order.

A. $F < Cl < Br < I$

B. $Cl < I < Br < F$

C. $I < Br < Cl < F$

D. $I < Cl < Br < F$

Answer: C

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4. Which of the following chemicals liberates bromine from a solution of KBr?

A. Cl_2

B. HI

C. I_2

D. $MgCl_2$

Answer: A

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5. At room temperature HCl is gas, while HF is a liquid. This is because

A. H - F bond is covalent

B. H - F bond is ionic

C. H - F has metallic bond

D. H - F has hydrogen bond

Answer: D

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Questions For Practice Very Short Answer Type Questions

1. Which halogen shows only one oxidation number in its compounds ?

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2. Define pseudohalogens with examples.

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3. Which halogen does not exhibit the oxidation state of +1?

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4. Which of the following elements does not show positive oxidation state? Oxygen, sulphur, fluorine, chlorine.

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5. Which hydracid of halogen has the highest bond energy?

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6. Acidic character increases from HF to HI Account for this.

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7. Concentrated hydrogen fluoride exists in the molecular formula of .....

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8. Arrange the following in order of increasing size: Cl, Cl^+, Cl^-

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9. F_2 has lower bond dissociation enthalpy than Cl_2. Why?

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10. Explain why halogens are strong oxidising agents.

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11. $SnCl_4$ is more covalent than $SnCl_2$.

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12. What is the oxidation number of oxygen in OF_2?

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13. Give two examples to show the anomalous behaviour of fluorine.

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14. Why hydrofluoric acid is the weakest of all the halogen acids ?

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15. Which acid is used to draw picture on glass?

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16. What happens when fluorine is passed through conc. NaOH solution?

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17. What happens when chlorine gas is passed through cold solution of NaOH?

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18. Give the reason for bleaching action of Cl_2.

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19. Name two poisonous gases which can be prepared from chlorine gas.

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20. What is the role of MnO_2 in the preparation of Cl_2 from HCl?

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21. Account for the following. Iron on reaction with HCl forms $FeCl_2$ and not $FeCl_3$.

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22. Why is ICl more reactive than I_2?

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23. Give reason for the following:

F_2 is more reactive than ClF_3 but ClF_3 is more reactive than Cl_2.

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24. Why ClF_3 exists, whereas FCl_3 does not exist explain?

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25. Draw the structure of BrF_3.

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26. Draw the structure of ClF_3.

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27. ClF_3 molecule has a T-shaped structure and not a trigonal planar one.

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Questions For Practice Short Answer Type I Questions

1. Sea is the greatest source of some halogens. Comment.

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2. Arrange the following in the order of property indicated set.

F_2, Cl_2, Br_2, I_2 in the increasing bond dissociation enthalpy.

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3. Arrange the following in the order of property indicated for set.

HF, HCl, HBr, HI in the increasing acidic strength.

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4. Why are halogens coloured ?

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5. HF is a liquid whereas HCl is a gas. Explain.

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6. HF is less volatile than HCl. Explain.

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7. Explain why inspite of nearly the same electronegativity, nitrogen forms hydrogen bonding while chlorine does not?

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8. Write the reactions of F_2 and Cl_2 with water.

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9. What happens when potassium bromide is treated with warm conc. sulphuric acid?

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10. What happens when chlorine gas is passed through cold solution of NaOH?

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11. How does the bleaching action of chlorine differ from that of sulphur dioxide? Explain.

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12. Why does chlorine exhibit bleaching action only in the presence of water?

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13. How can you prepare CI_2 from HCl and HCI from Cl_2 ?

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14. What happens when NaCl is treated with sulphuric acid in presence of MnO_2 ?

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15. Write the balanced equations for the following:

Chlorine gas is passed into a solution of NaI in water.

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16. Explain what happens when HCl gas is passed through concentrated NaCl solution?

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17. Why hydroiodic acid cannot be prepared by reacting KI with concentrated H_2SO_4?

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18. Why HF cannot be stored in glass bottle ?

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19. Explain. Why fluorine forms only one oxoacid, HOF?

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20. With what neutral molecules is ClO^- isoelectronic? Is that molecule a Lewis base?

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21. Give two examples and two general characteristics of interhalogen compounds.

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22. Explain why CIF_3 exists where as FCI_3 does not.

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Questions For Practice Short Answer Type Ii Questions

1. Considering the parameters such as bond dissociation enthalpy,electron gain enthalpy and hydration enthalpy, compare the oxidising power of F_2 and Cl_2.

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2. Explain. Why fluorine exhibits an oxidation state of -1 only, while other elements of the family exhibit oxidation state of -1 +1, +3, +5 and +7.

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3. What are the interhalogen compounds?Give examples.

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Questions For Practice Long Answer Type Questions

1. Describe how chlorine gas is prepared in the laboratory without heating. How does chlorine

react with (a) excess of ammonia and (b) hot sodium hydroxide solution? Explain with equation.

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2. How is fluorine prepared by Dennis method?

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3. What happens when fluorine is passed through

(a) Potassium iodide solution and

(b) Concentrated NaOH solution?

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Odisha Bureau S Textbook Solutions Multiple Choice Type Questions

1. The electronic configuration of halogen is

A. ns^2

B. ns^2np^3

C. ns^2np^5

D. ns^2np^4

Answer: C

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2. Which of the following shows only one oxidation state?

A. F

B. Cl

C. Br

D. I

Answer: A

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3. The most electropositive element is :

A. F

B. Cl

C. Br

D. I

Answer: D

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4. The smallest atom in the following is :

A. F

B. Cl

C. Br

D. I

Answer: A

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5. Fluorine does not show positive oxidation state due to absence of

A. p-orbitals

B. d-orbitals

C. s-orbitals

D. None of these

Answer: B

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6. Bromine gas turns starch iodine paper

A. blue

B. red

C. yellow

D. colourless

Answer: C

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7. Halogen having highest bond energy

A. F_2

B. Cl_2

C. I_2

D. Br_2

Answer: B

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8. Bleaching powder is

A. $CaClO_3$

B. CaClO

C. $CaOCl_2$

D. $Ca(OCl)_2$

Answer: D

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9. Which of the following statement is correct?

A. Br_2 is more reactive than Cl_2

B. I_2 is more reactive than Br_2

C. Cl_2 is insoluble in water

D. Iodine is solid

Answer: D

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10. Sea weeds are important source of

A. Fe

B. I_2

C. Cl_2

D. Br_2

Answer: B

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11. Among the C-X bond (where, X = Cl, Br, I) the correct bond energy is

A. $C-Cl>C-Br>C-I$

B. $C-I>C-Cl>C-Br$

C. $C-Br>C-Cl>C-I$

D. $C-I>C-Br>C-Cl$

Answer: A

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12. The strongest oxidising element is

A. F

B. Cl

C. Br

D. I

Answer: A

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13. Which of the following has the highest molar heat of vaporisation?

A. HF

B. HCl

C. HBr

D. HI

Answer: A

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14. Which of the following radicals can bring about the highest oxidation state of a transition metal?

A. F^-

B. Cl^-

C. Br^-

D. I^-

Answer: A

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15. The halogen that is most easily reduced is

A. chlorine

B. bromine

C. iodine

D. fluorine

Answer: D

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16. Which of the following has greatest reducing power?

A. HCl

B. HI

C. HF

D. HBr

Answer: B

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17. The halogen that is most easily reduced is

A. F_2

B. Cl_2

C. Br_2

D. I_2

Answer: A

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18. Oxidising action increases from left to right in the following order

A. $Cl < Br < I < F$

B. $Cl < I < Br < F$

C. $I < F < Cl < Br$

D. $I < Br < Cl < F$

Answer: D

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19. The number of electrons in a halogen in its outermost orbit in comparision with corresponding noble gas is

A. one electron less

B. one electron more

C. two electrons less

D. two electrons more

Answer: A

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20. Tear gas is

A. $COCl_2$

B. $CaOCl_2$

C. NH_3

D. CCl_3NO_2

Answer: D

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21. The element present in combined state in laminaria stenophylla is

A. bromine

B. iodine

C. fluorine

D. chlorine

Answer: B

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22. The compounds used as refrigerants are

A. NH_3

B. CCl_4

C. CF_4

D. CF_2Cl_2

Answer: A::D

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23. Which of the following displaces Br from an aqueous solution containing bromide ion.

A. Cl_2

B. Cl^-

C. I_2

D. I_3^-

Answer: A

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24. Which of the following compounds exists?

A. $KHCl_2$

B. KHF_2

C. $KHBr_2$

D. KHI_2

Answer: B

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25. Which of the following has the highest reducing power?

A. HCl

B. HI

C. HBr

D. HF

Answer: B

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26. Structure of IF_5 is

A. linear

B. pentagonal bipyramidal

C. bent T-shaped

D. square pyramidal

Answer: D

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Odisha Bureau S Textbook Solutions Very Short Answer Type Questions

1. Give any two uses of fluorine.

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2. HF is less volatile than HCl. Explain.

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3. What happens when HCl gas is passed through concentrated solution of sodium chloride?

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4. Arrange the halogen hydrides in the increasing order of bond lengths.

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5. Among the hydracids of halogens which is the weakest?

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6. Which of the halogens forms hydrogen bond ?

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7. Name an element which can belong bith to group IA and group VIIA of the periodic table.

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8. Which is the most electronegative element in the periodic table ?

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9. Which halogen shows only one oxidation number in its compounds ?

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10. Give the electronic configuration of chlorine atom.

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11. Which halogen does not exhibit the oxidation state of +1?

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12. Arrange the following in order of increasing electronegativity.

Cl, I, F, Br

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13. Arrange the following in the order of increasing size. Cl, Cl^+, Cl^-

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14. Which hydracid of halogen has the highest bond energy?

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15. What is the oxidation number of oxygen in OF_2?

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16. What is the role of MnO_2 in the preparation of Cl_2 from HCl?

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17. Which is the strongest of the halogen acids?

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18. Write two uses of ClO_3.

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19. What is the shape of IF_7 molecule?

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20. BrF_3 or ClF_5, which has bent T-shaped structure?

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21. Name two poisonous gases which can be prepared from chlorine gas.

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Odisha Bureau S Textbook Solutions Short Answer Type I Questions

1. Electron affinity of flourine is less than that of chlorine Why ?

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2. What happens when NaCl is heated with $K_2Cr_2O_7$ and conc. H_2SO_4?

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3. Glass apparatus are not used for isolation and storing of fluorine. Why?

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4. Why is the boiling point of hydrofluoric acid abnormally high?

5. Why is HF a liquid whereas other hydrides of halogens are gases?

6. Between HBr and HI which is more easily oxidised?

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7. Explain on the basis of electronic configuration. Why fluorine and chlorine are put in 17 group of periodic table?

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8. What happens when chlorine water is added to potassium iodide solution in small quantity? Given equation.

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9. What happens when H_2S is passed into chlorine water?

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10. HF is a liquid whereas HCl is a gas. Explain.

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11. Explain what happens when HCl gas is passed through concentrated NaCl solution?

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12. Arrange F_2, Cl_2, Br_2, I_2 in the increasing bond dissociation enthalpy. Justify your

answer.

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13. Why are halogens coloured ?

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14. When iron reacts with HCI, ferrous chloride is formed not ferric chloride, why ,?

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15. Arrange the halogen acids in increasing order of their acidic strength.

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Odisha Bureau S Textbook Solutions Short Answer Type Ii Questions

1. What happens when Cl_2 reacts with hot conc. NaOH? Show with equation that, this is a disproportionation reaction.

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2. Explain why halogens are strong oxidising agents.

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3. Explain. Why fluorine forms only one oxoacid, HOF?

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4. Given the reasons for anomalous behaviour of fluorine.

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5. How can you prepare Cl_2 from HCl and HCl from Cl_2 ? Write reactions only.

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6. What happens when Cl_2 gas is passed through a solution of NaI?

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7. Write the reactions of F_2 and Cl_2 with water.

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8. Predict the products obtained due to hydrolysis of ICl, ClF_3 and IF_7 .

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9. Fluorine never acts as the central atom in polyatomic interhalogen compounds.

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Odisha Bureau S Textbook Solutions Long Answer Type Questions

1. Give a comparative account of group 17 elements of periodic table.

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2. Write notes on the general characteristics of halogens.

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3. Write two methods of preparation of chlorine. Discuss its reaction with metals and non-metals. Write two of its uses.

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4. What happens when? Write equations

(i) Dry slaked lime reacts with Cl_2.

(ii) NH_3 reacts with excess Cl_2.

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5. Write notes on hydrides of halogens.

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Chapter Practice Multiple Choice Type Questions

1. Most acidic oxide among the following is

A. Cl_2O_5

B. Cl_2O

C. Cl_2O_3

D. Cl_2O_7

Answer: A

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2. Which one of the following has lowest bond dissociation energy?

A. $Cl - Cl$

B. $F - F$

C. $Br - Br$

D. $I - I$

Answer: C

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3. Fluorine is the best oxidising agent because it has

A. highest electron affinity

B. higest E_{red}

C. highest E_{oxid}

D. lowest electron affinity

Answer: D

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Chapter Practice Very Short Answer Type Questions

1. The least volatile hydrogen halide is .....

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2. Chemical properties of astatine in comparison with other halogens is known very little to us. Why?

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3. Define pseudohalogens with examples.

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4. Why does fluorine have exceptionally smaller bond dissociation enthalpy?

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5. Explain the following reaction:

Chlorine gas is passed through dry and aqueous sulphur dioxide.

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Chapter Practice Short Answer Type I Questions

1. What happens, when

(i) chlorine gas is passed into a solution of hot and concentrated NaOH?

(ii) chlorine reacts with dry slaked lime?

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2. In aqueous solution, HI is a stronger acid than HCl. Why?

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3. ClF_3 molecule has a T-shaped structure and not a trigonal planar one.

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Chapter Practice Short Answer Type Ii Questions

1. Complete the following reactions:

$NaCl + MnO_2 + H_2SO_4 \rightarrow$

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2. Complete the following reactions:

$Na_2CO_3 + 2HCl \rightarrow$

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3. Complete the following reactions:

$Cl_2 + ClF_3$

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Chapter Practice Long Answer Type Questions

1. (i) What are interhalogen compounds. Write some of their properties.

(ii) Why Cl_2 acts as bleaching agent?

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