P-Block Elements--VII-A Group Elements

2010

1. Which is monoatomic? [MP PMT]

1. Sulphur 2. Helium 3. Phosphorus 4. Chlorine

2. Which of the following compounds gives chlorine dioxide when it reacts with SO_2 in the presence of acid? [Guj.CET]

1. Sodium chloride 2. Sodium chlorate

3. Sodium perchlorate 4. Sodium chlorite

3. The correct order of acidity is [Haryana PMT]

1. $HClO < HClO_2 < HClO_3 < HClO_4$ 2. $HClO_4 < HClO_3 < HClO_2 < HClO$

3. $HClO < HClO_4 < HClO_3 < HClO_2$ 4. $HClO_4 < HClO_2 < HClO_3 < HClO$

4. Chlorine shows bleaching action in [OJEE]

1. Dry condition 2. Presence of HCl only

3. Moist condition 4. None of these

5. Fluorine is not prepared by general methods because [BVP]

1. HF can be easily oxidised 2. HF cannot be easily oxidised

3. HF is highly poisonous 4. HF is a good conductor of electricity

6. Fluorine reacts with water to give [BVP]

1. HF and O_2 2. HF and OF_2 3. HF and O_3 4. HF, O_2 and O_3

7. Which one of the following halogens has the highest bond dissociation energy? [VMMC]

1. F_2 2. Cl_2 3. Br_2 4. I_2

8. Assertion: F_2 has high reactivity.

Reason: F – F bond has low bond dissociation enthalpy. [VMMC]

1. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

2. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

3. Assertion is true but Reason is false.

4. Both Assertion and Reason are false.

2009

9. Which of the following halogens does not exhibit a positive oxidation number in their compounds? [KCT]

1. I 2. Br 3. Cl 4. F

10. Fluorine reacts with dilute NaOH and forms a gaseous product A. The bond angle in the molecule of A is [EAMCET]

1. $104^0 40'$ 2. 103^0 3. 107^0 4. $109^0 28'$

11. The most powerful oxidising agent of the following is [J & K CET]

1. I_2 2. F_2 3. Br_2 4. Cl_2

12. The reaction of Cl_2 with X gives bleaching power. X is [OJEE]

1. CaO 2. $Ca(OH)_2$ 3. $Ca(OCl)_2$ 4. $Ca(ClO_3)_2$

13. Hypochlorite disproportionates to give [OJEE]

1. Cl^- and ClO_4^- 2. ClO_4^- and ClO_3^- 3. ClO_3^- and Cl^- 4. ClO_2^- and Cl^-

14. The reaction that takes place when Cl_2 gas is passed through conc. NaOH solution is [WB JEE]

1. Oxidation 2. Reduction

3. Displacement 4. Disproportionation

2008

15. Which of the following dissolves in water but does not give any oxyacid solution? [CPMT]

1. SO_2 2. OF_2 3. SCl_4 4. SO_3

16. $NaCl, NaBr$ and NaI mixture on heating with conc H_2SO_4 gives gases, respectively [JCECE]

1. HCl, HBr, HI 2. HCl, Br_2, I_2 3. Cl_2, Br_2, I_2 4. Cl_2, HBr, HI

17. When chlorine reacts with dil. NaOH under cold conditions, the oxidation state of chlorine changes from zero to [J&K CET]

1. – 1 and + 5 2. + 1 and + 4

3. + 5 and + 3 4. – 1 and + 1

2007

18. Which one below is a pseudo halide? [AFMC]

1. CN^- 2. ICI 3. IF_5 4. I_3^-

19. Which one of the following is the true covalent oxide of iodine? [AIIMS]

1. I_2O_4 2. I_2O_5 3. I_2O_7 4. I_2O_9

20. Which reaction is not feasible? [BHU]

1. $2KI + Br_2 \rightarrow 3KBr + I_2$ 2. $2KBr + I_2 \rightarrow 2KI + Br_2$

3. $2KBr + Cl_2 \rightarrow 2KCl + Br_2$ 4. $2H_2O + 2F_2 \rightarrow 4HF + O_2$

21. Chlorine reacts with excess of ammonia to form [Kerala CEE]

1. NH_4Cl 2. $N_2 + HCl$ 3. $N_2 + NH_4Cl$ 4. $N_2 + NCl_3$ 5. $NCl_3 + HCl$

22. Which of the following is not correct? [EAMCET]

1. In Nelson method of NaOH preparation, Cl_2 is liberated at anode

2. With hot and concentrated NaOH, Cl_2 gas gives NaOCl.

3. NaOH reacts with white phosphorus to give phosphine

4. NaOH is used in rayon industry

23. Bleaching action of $CaOCl_2$ is due to [RPMT]

1. Nascent Oxygen 2. Chlorine 3. HClO 4. HCl

24. Least stable oxide of chlorine is [BCECE]

1. Cl_2O 2. ClO_2 3. Cl_2O_7 4. ClO_3

25. The bleaching action of chlorine is due to the liberation of the following **[J&K CET]**

1. HOCl 2. HCl 3. $[O]$ 4. O_2

2006

26. Tincture of iodine is

1. XeF_2 2. XeF_4 3. XeO_3 4. XeF_6

27. What is X, in the following reaction?

$KHSO_4 + F_2 \rightarrow HF + X$ **[EAMCET]**

1. K_2SO_4 2. $K_2S_2O_4$ 3. $K_2S_2O_2$ 4. $K_2S_2O_8$

28. Solubility of iodine in water may be increased by adding **[Manipal]**

1. Chloroform 2. Potassium Iodide

3. Carbon Disulphide 4. Sodium Thiosulphate

29. Which of the following is anhydride of perchloric acid? **[RPMT]**

1. Cl_2O_7 2. Cl_2O_5 3. Cl_2O_3 4. HClO

30. Fluorine is the best oxidising agent because it has **[RPMT]**

1. Highest electron affinity 2. Highest E^o_{red}

3. Highest E^o_{oxid} 4. Lowest electron affinity

31. Colour of the solution when KI reacts with Br_2 is **[JCECE]**

1. Blue 2. Black 3. Red 4. No change

2005

32. Which one of the following oxides is expected to exhibit paramagnetic behaviour? [CBSE AIPMT]

1. CO_2 2. SO_2 3. ClO_2 4. SiO_2

33. What is the formula of bleaching power? [Punjab PMET]

1. $CaO(OCl)$ 2. $Ca(OCl)Cl$ 3. $Ca(OCl)_2$ 4. $Ca(OCl)_2 Cl$

34. The mixture of concentrated HCl and HNO_3 made in 3:1 ratio contains [Kerala CEE]

1. ClO_2 2. NOCl 3. NCl_3 4. N_2O_4

5. N_2O

35. S_2Cl_2 Hydrolyses slowly to form HCl, SO_2 and X. Which of the following is X? [EAMCET]

1. SO_3 2. H_2 3. O_2 4. S

36. Which of the following is not correct? [EAMCET]

1. XeO_3 has four σ and four π -bonds.

2. The hybridization of Xe in XeF_4 is sp^3d^2.

3. Among noble gases, the occurrence (per cent by weight) of argon is highest in air.

4. Liquid helium is used as cryogenic liquid.

37. Which of the following is the strongest acid? [Haryana PMT]

1. $ClO_3(OH)$ 2. $ClO_2(OH)$ 3. $SO(OH)_2$ 4. $SO_2(OH)_2$

2004

38. Assertion: $HClO_4$ is a stronger acid than $HClO_3$.

Reason: Oxidation state of Cl in $HClO_4$ is + 7 and in $HClO_4$ + 5.

[AIIMS]

1. Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

2. Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

3. Assertion is true but Reason is false.

4. Both Assertion and Reason are false.

39. Among the halogens, the one which is oxidised by nitric acid is [KCET]

1. Fluorine 2. Iodine 3. Chlorine 4. Bromine

40. pH_a will be maximum for [RPMT]

1. $HClO_4$ 2. $HClO_3$ 3. $HClO_2$ 4. $HClO$

41. Which is the coordinating solvent in the following reaction? [RPMT]

$BF_3 + HF + H_2O \rightarrow H_3O^+ + BF_4^-$

1. HF 2. H_2O 3. NH_3 4. BF_3

42. Which of the following product is formed by the reaction of sulphur dioxide with chlorine in presence of sunlight?

1. SO_2Cl 2. SO_2Cl_2 3. $SOCl_2$ 4. SO_3Cl

VIIA GROUP ELEMENTS PREVIOUS QUESTIONS KEY

1) 2	2) 2	3) 1	4) 3	5) 2	6) 4	7) 2	8) 1	9) 2	10) 4
11) 2	12) 2	13) 3	14) 4	15) 2	16) 2	17) 4	18) 1	19) 2	20) 2
21) 3	22) 2	23) 1	24) 1	25) 3	26) 2	27) 4	28) 2	29) 1	30) 2
31) 2	32) 3	33) 2	34) 2	35) 4	36) 3	37) 1	38) 1	39) 2	40) 4
41) 1	42) 2								

VIIA GROUP ELEMENTS PREVIOUS QUESTIONS SOLUTIONS

1. Helium (He) is a noble and monoatomic gas.

2. Commercially chlorine dioxide is prepared by passing SO_2 gas into a mixture of sodium chlorate and H_2SO_4 having NaCl in traces.

3. As the oxidation number of Cl-atom increases from HClO to $HClO_4\left(i.e.,+1 to+7\right)$, the possibility of getting H atom as H^4 ion by the rupture of $O-H$ bond increases. Hence, the correct order acidity is $H\overset{+1}{C}lO < H\overset{+2}{C}lO_2 < H\overset{+3}{C}lO_3 < H\overset{+4}{C}lO_4$

4. In moist condition it releases nascent oxygen that can act as a bleaching agent

5. Fluorine is not prepared by general methods used for the preparation of Cl_2 and Br_2 because HF cannot be easily oxidised to (Fluorine is the most electronegative element).

6. Fluorine reacts with water to give both O_2 and O_3.

$$2H_2O+2F_2 \xrightarrow{Cold} 4HF+O_2$$

$$3H_2O+3F_2 \xrightarrow{Hot} 6HF+O_3$$

8. Fluorine is the most reactive of all the halogens due to its low bond dissociation enthalpy. Hence, Reason is the correct explanation of Assertion.

9. F is the most electronegative atom. So, it cannot exhibit positive oxidation state.

11. F_2 is the most powerful oxidising agent among halogens.

12. $Ca(OH)_2+Cl_2 \rightarrow \underset{bleaching\ power}{Ca(OCl)Cl}+H_2O$

13. $2HClO \rightarrow 2HClO_3 + HCl$

14. $3\overset{0}{C}l_2 + 6NaOH \underset{(conc.)}{\rightarrow} 5Na\overset{1}{C}l + \underset{sodium chlorate}{NaClO_3} + H_2O$

19. In general, higher the oxidation state more is the covalent character of the oxide. I_2O_7 and I_2O_9 do not exist. I_2O_4 is ionic in nature. It is in fact iodyl iodate $[IO]^+[IO_3]^-$. The only covalent oxide of iodine is I_2O_5.

20. $2KBr + I_2 \rightarrow 2KI + Br_2$

Reaction is not possible because Br^- ion is not oxidised Br_2 with I_2 due to higher electrode potential of I_2 than bromine.

21. $3Cl_2 + \underset{excess}{8NH_3} \rightarrow 6NH_4Cl + N_2 \uparrow$

22. $\underset{Hot+conc.}{6NaOH} + 3Cl_2 \rightarrow 5NaCl + \underset{sodium chlorate}{NaClO_3} + 3H_2O$

23. $2CaOCl_2 + \underset{(limited)}{H_2SO_4} \rightarrow CaC_2 + CaSO_4 + 2HClO$

$HClO \rightarrow HCl + [O]$

On account of evolution of nascent oxygen, it acts as in oxidising and bleaching agent

25. Chlorine reacts slowly with H_2O to form HCl and HOCl. The HOCl then decomposes into HCl and [O] radicals.

$C_2 + H_2O \rightleftharpoons HCl + HOCl$

$HOCl \rightarrow HCl + [O]$

This nascent oxygen is very strong oxidising as well as effective bleaching agent in aqueous solution of Cl_2 or hypochlorite salt.

26. 50% (by mass) alcohol solution of iodine is called tincture of iodine. It is used as an antiseptic.

27. $2KHSO_4 + F_2 \rightarrow 2HF + \underset{(X)}{K_2S_2O_8}$

28. The solubility of I_2 in water increases by the addition of KI due to formation of polyhalide ion, i.e., I_3^-. $KI + I_2 \rightarrow KI_3$

29. Chlorine heptoxide (Cl_2O_7) is the anhydride of perchloric acid

$$2HClO_4 \xrightarrow{\Delta} Cl_2O_7 + H_2O$$

30. Fluorine has the highest E^0_{red} (equal to +2.9 V) due to which it can easily accept an electron and hence it the best oxidising agent.

31. Bromine liberates iodine from KI solution because of its oxidising property. Colour of iodine is grey black so, black colour is obtained.

$$2KI + Br_2 \rightarrow 2KBr + \underset{(black\ or\ grey)}{I_2}$$

33. Bleaching power is $Ca(OCl)Cl$ or $CaOCl_2$.

34. The mixture of one part of conc. HNO_3 and three parts of conc. HCl is known as aqua regia. It contains NOCl.

$$HNO_3 + 3HCl \rightarrow 2H_2O + NOCl + 2Cl$$

35. $2S_2Cl_2 + 2H_2O \rightarrow 3S + SO_2 + 4HCl$

36. In Whytlaw-Gray's method fluorine is obtained by electrolysis of molten KHF_2 in a cell made of Cu, Ni or monel metal.

$$2KHF_2 \rightleftharpoons 2K^+ + 2H^+ + 4F^-$$

$$4F^- \rightarrow 2F_2 + 4e^-$$

37. Perchloric acid $(HClO_4)$ is the strongest acid among these.

38. $HClO_4$ is stronger acid than $HClO_3$. The oxidation number of Cl in $HClO_4$ is+7 and in $HClO_3$ is +5. The acid strength of oxyacid of the same halogen increases with the increase in oxidation number of halogen.

$$HOCl < HClO_2 < HClO_3 < HClO_4$$

It can also be explained on the basis of presence of oxygen atoms. The acidity of acid increases with increase in number of oxygen atoms as the electronegative (powerful electron withdrawing group) weakens the – OH bond and thus proton can be donated easily.

39. Nitric acid oxidise iodine into iodic acid (HIO_3)

$$10HNO_3 + I_2 \rightarrow \underset{iodic\,acid}{2HIO_3} + 10NO_2 + 4H_2O$$

40. The correct order of acidity of these acids is

$$\overset{+7}{H}\overset{}{C}lO_4 > H\overset{+5}{C}lO_3 > H\overset{3}{C}lO_2 > H\overset{+1}{C}lO$$

41. HF of acts as a coordinating solvent. It loses proton and F^- forms coordinate bond with BF_3.

42. $SO_2 + Cl_2 \xrightarrow{h\nu} \underset{sulphuryl\,chloride}{SO_2Cl_2}$