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Class: 11
Subject: Chemistry
Topic: ASK1511EUT05
No. of Questions: 30

Q1. HCl is added to the following oxides. Which one would give H_2O_2 ?

(A) MnO_2 (B) PbO_2

(C) BaO (D) none of the above

Sol. (d)

Since none of the oxides is a peroxide. Hence none of them would give H_2O_2.

Q2. The oxidation state of the most electronegative element in the products of the reaction, BaO_2 with dil. H_2SO_4 are

(A) 0 and -1 (B) -1 and -2

(C) -2 and 0 (D) -2 and +1

Sol. (D)

These are group 2 elements and hence the oxidation state

Q3. When the same amount of zinc is treated separately with excess of sulphuric acid and excess of sodium hydroxide, the ratio of volumes of hydrogen evolved is

(A) 1 : 1 (B) 1 : 2

(C) 2 : 1 (D) 9 : 4

Sol. (A)

$$Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$$

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$Zn + 2NaOH \longrightarrow Na_2ZnO_2 + H_2$

The ratio of volumes of H_2 evolved in both the cases is 1 : 1.

Q4. Among KO_2, AlO_2^-, BaO_2 *and* NO_2^+.Unpaired electron is present in

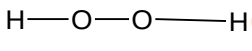
(A) NO_2^+ and BaO_2 (B) KO_2 and AlO_2

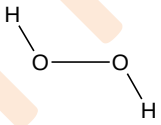
(C) KO_2 only (D) BaO_2 only

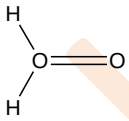
Sol. (D)

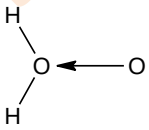
Refer to the structure of the compounds

Q5. Which of the following is the true structure of H_2O_2?

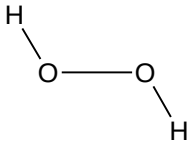
(A) 

(B) 

(C) 

(D) 

Sol. (B)

Oxygen atom is sp^3 hybridized having two large pair of electrons. Therefore the structure of hydrogen peroxide is 

Q6. A solution of sodium metal in liquid ammonia is strongly reducing due to the presence of

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(A) sodium atoms

(B) sodium hydride

(C) sodium amide

(D) solvated electrons

Sol. (D)

fact

Q7. When electric current is passed through an ionic hydride in the molten state

(A) hydrogen is liberated at the anode

(B) hydrogen is liberated at the anode

(C) no reaction takes place

(D) hydride ion migrates towards cathode

Sol. (A)

Ionic hydride contains H^- ion which liberates H_2 at the anode.

Q8. The compound insoluble in acetic acid is

(A) calcium oxide

(B) calcium carbonate

(C) calcium oxalate

(D) calcium hydroxide

Sol. (C)

Q9. Which of the following can not be oxidized by H_2O_2 ?

(A) KI + HCl

(B) O_3

(C) PbS

(D) Na_2SO_3

Sol. (B)

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O_3 is more powerful oxidizing agent than H_2O_2. So H_2O_2 reduces O_3 to O_2.

$$O_3 + H_2O_2 \longrightarrow H_2O + 2O_2$$

Q10. Which of the following on heating do not decompose?

(A) Li_2CO_3 (B) $BaCO_3$

(C) Na_2CO_3 (D) none

Sol. (C)

Q11. The reaction

$Ag_2O + H_2O_2 \longrightarrow 2Ag + H_2O + O_2$ takes place in

(A) basic medium (B) bleaching agent

(C) neutral medium (D) both in acidic and basic medium

Sol. (A)

H_2O_2 on oxidation gives O_2 only in basic medium

Q12. The solubility in water of sulphates down the Be groups is Be>Mg>Ca > Sr > Ba. This is due to

(A) increase in melting point (B) high ionization energy

(C) higher coordination number (D) all of these

Sol. (C)

Q13. Which of the following compounds turns white on treatment with H_2O_2.

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(A) HgS (B) PbS

(C) NiS (D) CuS

Sol. (B)

$$\underset{\text{black}}{PbS} + 4H_2O_2 \longrightarrow \underset{\text{white}}{PbSO_4} + 4H_2O$$

Q14. Solubilites of carbonates decreases down the magnesium group due to decrease in

(A) entropy of solution formation (B) lattice energies of solids

(C) hydration energy of cations (D) inter-ionic attraction

Sol. (C)

Q15. Molecular formula of Glauber's salt is:

(A) $MgSO_4.7H_2O$

(B) $FeSO_4.7H_2O$

(C) $CuSO_4.5H_2O$

(D) $Na_2SO_4.10H_2O$

Sol. (D)

Q16. The paramagnetic species is

(A) KO_2 (B) SiO_2

(C) TiO_2 (D) BaO_2

Sol. (A)

Q17. Semi water gas is a mixture of

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(A) $CO + H_2$ (B) $CO + N_2$

(C) $CO + H_2 + N_2$ (D) none

Sol. (C)

Mixture of CO + H_2 + N_2 is called semi water gas.

Q18. Which of the following substances can be used for drying gas?

(A) calcium carbonate (B) sodium carbonate

(C) sodium bicarbonate (D) calcium oxide

Sol. (D)

Q19. Which one of the following orders presents the correct sequence of the increasing basic nature of the given oxides?

(A) $K_2O < Na_2O < Al_2O_3 < MgO$ (B) $Al_2O_3 < MgO < Na_2O < K_2O$

(C) $MgO < K_2O < Al_2O_3 < Na_2O$ (D) $MgO < K_2O < Na_2O < Al_2O_3$

Sol. (B)

* Basic nature of oxides increases with increase in the size of cation.

* The increasing order of cations is: $Al^{3+} < Mg^{2+} < Na^{+} < K^{+}$

* Therefore the increasing correct order of basic strength is: $Al_2O_3 < MgO < Na_2O < K_2O$

Q20. KO_2(potassium superoxide) is used in oxygen cylinders in space and submariners because it

(A) absorbs CO_2 and increases O_2 content (B) eliminates moisture

(C) absorbs CO_2 (D) produces ozone

Sol. (A)

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Q21. Volume of same weight of ice is…….than/to the same weight of water

(A) More

(B) Less

(C) Equal

(D) not related

Sol. (A)

Q22. The correct order of stability for the following super oxides is:

(A) $KO_2 > RbO_2 > CsO_2$

(B) $RbO_2 > CsO_2 > KO_2$

(C) $CsO_2 > RbO_2 > KO_2$

(D) $KO_2 > CsO_2 > RbO_2$

Sol. (C)

Logic:

* The stability of super oxides depend on the polarizing power of the cation. Lesser the polarizing power, greater is the stability of superoxide ion.

* The polarizing power of cations of same charge decreases with increase in the size.

* Therefore, the stability of super oxides increases with increase in the size of cations.

* The increasing order of size of ions is: $K^+ < Rb^+ < Cs^+$.

* The correct order of stability is: $CsO_2 > RbO_2 > KO_2$

Q23. Which of the following hydrides is covalent compound?

(A) LiH

(B) NaH

(C) MgH_2

(D) CaH_2

Sol. (C)

Q24. The correct order of stability for the following super oxides is:

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(A) Na_2O (B) Na_2O_2

(C) K_2O (D) KO_2

Sol. (D)

Logic:

* The superoxide ion has an odd electron it and hence the superoxides are paramagnetic.

Q25. Which of the following hydroxides is amphoteric?

(A) $Mg(OH)_2$ (B) $Ca(OH)_2$

(C) $Be(OH)_2$ (D) $Sr(OH)_2$

Sol. (C)

Q26. The chemical formula of feldspar is:

(A) $KAlSi_3O_8$ (B) Na_3AlF_6

(C)$NaAlO_2$ (D) $K_2SO_4.Al_2(SO_4)_3.4Al(OH)_3$

Sol. (D)

Feldspars are a family of aluminosilicate minerals. $K_2O.Al_2O_3.6SiO_2$ or $KAlSi_3O_8$ is called potassium feldspar or K-spar. It is a tectosilicate.

Q27. The O – O – H bond angle in H_2O_2 in gas phase is

(A) 106^o (B) $109^o28'$

(C) 120^o (D) 94.8^o

Sol. (D)

Q28. What are the products formed when Li_2CO_3 undergoes decomposition?

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(A) Li_2O_2, CO

(B) Li_2O, CO

(C) Li_2O,CO_2

(D) LiO_2, CO

Sol. (C)

Lithium carbonate is unstable carbonate due to polarizing power of Li^+. Hence it undergoes easy dissociation just like alkaline earth metal carbonates upon heating to give lithium oxide and carbon dioxide.

Li_2CO_3 --------> $Li_2O + CO_2$

Q29. Amongst $H_2O, H_2S, H_2Se\ amd\ H_2\ Te$ the one with the highest boiling point is

(A) H_2O because of hydrogen bonding

(B) H_2Te because of higher molecular weight

(C) H_2S because of hydrogen bonding

(D) H_2Se because of lower molecular weight

Sol. (A)

Q30. Among the alkali metals, the metal with the highest ionization potential is:

(A) Na

(B) Li

(C) Rb

(D) Cs

Sol. (B)

The ionization potential decreases from top to bottom in a given group with increase in the size of atom. Hence 'Li' possesses highest ionization potential among alkali metals.